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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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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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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).

2

42   **Conclusions:** analyzing responses to the open-ended question in the CoCB-NL led to new insights into

43   relevant elements of work environment and provided context to CoCB-NL scores. Moreover, the analysis

44   revealed important themes that not only require attention from healthcare organizations but should

45   also be considered to further develop the CoCB-NL.

46

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.

47

48   **Keywords:** work environment, health care organizations, equity and inclusion, human resources, RADaR

49   technique, Culture of Care Barometer, open comments

50

3

51 **INTRODUCTION**

52 Worldwide healthcare organizations face severe workforce shortages that pose a threat to the quality of

53 care.[1] Hence, a major challenge for healthcare organizations is to attract and retain sufficient numbers

54 of healthcare employees. Improving the work environment can help organizations attract and retain

55 healthcare employees. [2][3] Reasons for quitting the profession include high workload, forced overtime,

56 lack of influence on practices and insufficient use of employees professional competencies. [2-5] In

57 contrast, a positive work environment reduces the intention to leave,[2][6] enhances employee outcomes

58 (e.g., job satisfaction [3][7]) and patient outcomes (e.g., lower hospital acquired infection rates [4][8] and fewer

59 re-admissions [9]). Work environment (WE) is defined as "the internal setting of the organization where

60 employees work". It consists of the physical environment, culture, social climate and context of

61 functions, tasks and roles. [10] In the literature, a positive WE is characterized by respect and trust

62 between employees at all levels, effective cooperation and communication, recognition and

63 appreciation, management support, and an work environment that is both physically as well as

64 psychological.[11][12] For healthcare organizations, creating and sustaining a positive WE begins with

65 understanding employees' current perceptions of their WE.

66 A common strategy for healthcare organizations to gain insight into employees' perceptions of

67 their WE is to conduct a (satisfaction) survey. [13] Multiple validated questionnaires are available to assess

68 WE, each with a slightly different area of focus, target audience, or length. [14][15] The questionnaires are

69 commonly composed of statements linked to Likert-type scales that ask how much a respondent agrees

70 with the specific statement. [15] Likert-type scales are often used to examine self-reported perceptions as

71 they are easy to administer, and allow standardized and/or numerical information collection. [16]

72 However, a reported limitation of Likert-type scales is that they present the results in numbers that are

73 difficult to interpret and translate into daily practice - especially when seeking to improve the measured

74 construct. [17] Furthermore, Likert-type scale items are usually generated from the underlying latent

4

75 construct the scale developer aimed to measure. [16][18] If certain topics are not captured during the survey

76 development, relevant items based on the latent construct may not be addressed and could thus remain

77 out of scope or be interpreted differently.

78 To tackle the potential loss of information when studying perceptions with closed-ended

79 questions, it is common to finish with an open-ended question at the end of the survey.[19] Hence, the

80 questionnaires frequently used by healthcare organizations contain such a question, for WE (e.g.,

81 Practice Environment Scale of the Nursing Work Index [20]; Essentials of Magnetism Tool [21]) and safety

82 climate (Safety Attitudes Questionnaire [22]). The responses to open-ended questions could provide

83 useful indications and directions for practice improvements. Numerical results could illustrate the

84 importance of these responses. [22] Although many questionnaires often give respondents the

85 opportunity to comment on issues in the open-ended question, [19] their answers are rarely reported in

86 scientific publications. Researchers and practitioners often face dilemmas in valuing and analyzing the

87 open answers. [19] Due to the lack of reports on these responses, the content of the questionnaire might

88 not match the current opinions of the respondents. Although it is common to establish survey validity

89 and reliability, most validation strategies occur within the framework of the statements and Likert-scale

90 answers developed by the researchers. [19] Hence, it is conceivable that shifts in perceptions over time are

91 not captured, particularly for constructs like WE that are multifaceted and subjective. [17]

92 We examined the content of answers given to the open-ended question in the Dutch Culture of

93 Care Barometer (CoCB-NL). [23][24] A questionnaire for healthcare employees, the CoCB-NL assesses

94 organizational WE with 30 positively formulated items on five factors: 'organizational support',

95 'leadership', 'collegiality & teamwork', 'relation with manager' and, 'employee influence and

96 development'.[24] It concludes with one open-ended question: "What, if any, action needs to be taken to

97 improve the culture of care of your work environment?" [23] By systematically analyzing the responses to

98 this open-ended question we aimed to examine 1) if the responses led to new insights or additional

5

99 information on healthcare employees' perceptions of their WE and 2) if any themes are missing in the

100 CoCB-NL questionnaire. The knowledge gained would be valuable for ongoing improvements to

101 measuring and enhancing WE, a prerequisite for attracting and retaining healthcare employees. To

102 address the study aim, we focused on answering two research questions:

103 1. What additional information on healthcare employees' perceptions of WE can be found by

104 systematically analyzing the open-ended question of the CoCB-NL?

105 2. Is this information different than addressed by the closed-ended questions in the CoCB-NL?

106

METHODS

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Design

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109 We conducted a retrospective analysis of comments responding to the open-ended question of the

110 validated CoCB-NL[24] using the RADaR (Rigorous and Accelerated Data Reduction) technique. [25] RADaR is

111 a systematic way of transforming raw textual data into manageable data tables fit for rigorous analysis

112 and concise presentation and therefore suitable for thematic analysis of large amount of qualitative

113 data, as was available in this study. [25] The reporting in this study complies with the Standards of

114 Reporting Qualitative Research (SRQS). [26]

Sample & setting

115

116 The setting was a Dutch university hospital (14,671 employees, 1100 beds with 30,288 admissions and

117 628,904 outpatient visits in 2022) that periodically conducts employee satisfaction surveys, including the

118 Dutch version of the CoCB.[24] For this study, all employees were informed prior to the survey by their

119 management and through the organization's communication channels and were sent an invitation to

120 participate by email. The survey took place in February 2022 and was available in both Dutch and English

121 to be accessible to both national and international employees.

6

122 **Data collection**

123 Data was collected via the digital tool LimeSurvey®. The survey comprised several validated

124 questionnaires measuring the employee's experience of 'work environment' (CoCB-NL[23 24]), 'safety

125 climate' (Safety Attitudes Questionnaire, subscale Safety Climate[22 27]), 'work engagement' (Utrecht Work

126 Engagement Scale [28]), 'work-life balance' [29] and 'work ability' (Work Ability Index item 1 [30]). The survey

127 concluded with a demographics sections (respondent's department, profession or function) applying

128 categorical response options to guarantee anonymity. The CoCB-NL measure of work environment (WE)

129 was in the first part of the survey. It posed a total of 30 closed-ended questions followed by one open-

130 ended question: "What, if any, action needs to be taken to improve the culture of care in your work

131 environment." The response field for this open-ended question had no word or character limit. Our

132 study included all the completed questionnaires containing a response to this open-ended question

133 (2287 comments/6144 respondents, 37 %).

134 **Patient and public involvement**

135 Patients and the public were not involved in this study.

136 **Ethical considerations**

137 Permission for utilizing the data in this study was granted by the owners of the anonymous data set: the

138 board of (BLINDED for PEER REVIEW). Study approval was obtained from the Ethical Review Board of

139 (BLINDED for PEER REVIEW). Collected and stored in the (BLINDED for PEER REVIEW) Repository, the

140 pseudonymized study data is available upon request.

141   Study participation was anonymous and voluntary. Participants were informed about the study

142 in the announcement e-mail and on the first page of the questionnaire. Participants gave implicit

143 consent by proceeding to the substantive questions on the second page. Researchers only had access to

7

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.

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.

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.

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

8

166 comments in total, 501 comments referred to multiple issues, 391 comments addressed two themes, 97

167 addressed three themes, nine addressed four themes, and four comments addressed five themes. In

168 total 128 comments were excluded either because the respondents indicated that they had nothing to

169 add, found the questionnaire inappropriate, or had recently started their job and thought that they did

170 not known enough to be able to answer the questions. The final dataset contained 2787 comments

171 given by 2159 individual respondents.

172 SM reread the comments labeled to one of five CoCB-NL factors and subcategorized them in 24

173 themes. Two researchers (LS and CvO) crosschecked 70% of the labeling (82% agreement) and

174 suggested alternatives in the case of disagreement. The alternatives were discussed up to consensus by

175 two researchers (CvO and AMW). Then we wrote a first draft of theme descriptions. The whole research

176 team checked the descriptions of each theme several times for consistency and comprehensibility.

177 Several descriptions were altered and some themes were merged.

178 Subsequently, in the fourth step, SM reread, sorted and labeled the 'other' comments, which

179 resulted in the identification of nine additional themes. LS crosschecked all these comments (97%

180 agreement) and the whole research team discussed the results. This led to the exclusion of another 244

181 comments (total excluded n = 372) because they did not contain enough information for the researchers

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

183 communication' (r431)).

184 *Phase 3: Formulating the final themes – step 5*

185 In the final stage one researcher not involved in the coding/labeling process (AMW) reviewed the final

186 themes and descriptions for clarity and distinctiveness. Keeping the research questions in mind, then the

187 whole research team critically discussed the identified themes and further clustered the overlapping

188 themes. The final code list contained 33 themes, of which 24 were based on the closed-ended questions

189 of the CoCB-NL and nine were additional to the CoCB-NL.

9

190

RESULTS

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

193   **<please insert Table 1 about here>**

194

195   We analyzed 2915 comments, excluding 372 comments in total, based on the criteria 'lack of content'

196   (n=244), 'nothing to add' (n=104), question not appropriate' (n=13) and 'new in job' (n=11), a total of

197   372 comments are excluded. After exclusion the 2543 remaining comments are allocated to 33 themes.

198   In total, 2113 comments are labelled with 24 themes related to the five CoCB-NL factors and associated

199   close-ended questions, and 430 comments addressed additional themes (n=9). Figure 1 gives an

200   overview of the themes related to the CoCB-NL factors and the additional themes. Table 2 defines the

201   themes.

202

203   **<please insert Figure 1 and Table 2 about here>**

204

205   **Themes aligning with the CoCB-NL closed-ended questions**

206   We identified 24 themes that align with the closed-ended questions in the CoCB-NL (Figure 1). These

207   themes represent almost all of the 30 closed-ended questions, except for two items, 'a good place to

208   work' and 'proud to work', which both belong to the factor 'organizational support'. Respondents did

209   not differentiate between organizational level and team level for the items 'informed about what's

210   going on in team /organization' and 'influence in team/organization' of the factors 'leadership' and

211   'influence & development of employees'. Based on respondents' comments on the lack of kind or

212   collegial behavior we distinguished the theme 'demeanor', which matches the factor 'collegiality &

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213 teamwork'. Although formulated positively, current the CoCB-NL items 'friendly colleagues', 'rely on

214 colleagues' and 'being treated with respect by colleagues' are commensurate with this theme.

215   The CoCB-NL factor most frequently commented on was 'organizational support' (n=556), while

216 the factor with the least number of comments was 'relation with manager' (n=291). The 'resources'

217 theme belonging to the factor 'organizational support' was most frequently commented on (n=286). We

218 were able to identify six types of resources: 'suitable physical worksite', 'sufficient equipment &

219 material', 'enough staff to do the job well', 'functioning service facilities', 'ICT systems' and 'enough

220 financial resources available'. For the factor 'collegiality & teamwork' we found 56 positive comments

221 on WE in which respondents said they had no suggestions for improvement (theme 'team climate'). In

222 contrast, 16 respondents reported unacceptable behavior from colleagues (theme 'demeanor') and 113

223 respondents called for action on undesirable or dysfunctional behavior by leaders (theme 'tackling

224 unacceptable behavior'; factor 'leadership').

225   The largest theme emerging in the CoCB-NL factor 'employee influence and development' was

226 'professional development' (n=127), followed by 'organization listens' (n=106) and 'impact on policy'

227 (n=93). Respondents mentioned that they find it important to have space for professional development

228 and to be taken seriously because this proves they are regarded as valuable assets to the organization.

229 Most commented on for the factor 'relation with manager' was the need for a supportive (n=80) and

230 easily accessible (n=84) manager.

231 Emerging themes

232 In total we identified nine additional themes (green spheres in Figure 1). Five themes relate to the CoCB-

233 NL factors 'collegiality & teamwork', 'organizational support', 'and 'leadership', but address subjects not

234 covered by the associated closed-ended questions. The themes 'team connectedness' (n=108) and

235 'team effectiveness' (n=67), relate to teamwork and are therefore assigned to 'collegiality & teamwork'.

236 However, 'team connectedness' and 'team effectiveness' refer to belonging to a team, something that

11

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.

253

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

12

260 almost all the elements of the Dutch CoCB-NL and the original CoCB,[23] [24] which shows the relevance of

261 using this tool to measure the WE.

262 Of the nine additional themes we distinguished, five relate to factors of the COCB-NL: 'team

263 connectedness', 'team effectiveness', 'corporate vision', 'administrative burden' and 'performance

264 pressure'. The remaining four themes are: 'diversity & inclusion', 'resilience & work-life balance',

265 'personal matter', and 'legal frameworks and collective bargaining'. Except for 'resilience & work-life

266 balance', 'personal matter', and 'legal frameworks and collective bargaining', all concern the employees'

267 experience of their work environment. They are known elements of the healthcare employees' WE that

268 have an effect on patient or personnel outcomes. [3] [11] [31] Hence, adding these four themes to the COCB-

269 NL, or the original CoCB[23] and other translations[32] should be considered.

270 The themes 'team connectedness' and 'team effectiveness' emerged from comments on the

271 employee's experiences during the Covid-19 pandemic. While working at home and meeting only online,

272 employees found it hard to connect with team members and be effective as a team. However, after the

273 pandemic, working remotely (from home) has become the 'new normal' for employees not providing

274 direct patient care. [33] [34] Therefore, our findings show the importance for healthcare organizations to

275 understand the influence on WE on remote working. More research in this direction is needed. Also, the

276 theme 'legal frameworks and collective bargaining' was mentioned quite often. The comments referred

277 especially to the collective bargaining agreements, which were under debate at the time the survey was

278 conducted.[35] Although these results can be attributed to a specific event or point in time, it is important

279 to consider measuring 'team connectedness', ' team effectiveness' and 'legal frameworks and collective

280 bargaining' as part of the WE as both patient and personnel outcomes benefit from team connectedness

281 and effectiveness. [36] [37] Also, external conditions or structures, such as a law regulating working hours,

282 influence the employee roster, which in turn affects the work-life balance of the individual professional

283 and foster employees' concerns. [38] [39] Healthcare organizations should take these concerns seriously.

13

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

14

307 responses in our data set, future research should highlight the importance of providing rich responses to

308 open-ended questions that include information on context.

309 **Strengths & limitations**

310 To generate data from open-ended responses, the use of a systematic method is recommended.[19][46] We

311 applied RADaR[25] to systematically analyze and quantify the comments on the open-ended question of

312 the CoCB-NL. This technique allowed us to rigorously analyze the large amount of data by reduction in

313 tables and thereby to answer our research questions. To avoid the risk of missing hidden themes with

314 RADaR only[47], at least two researchers performed the data analysis by independently allocating

315 comments to themes. Analyses of responses to open-ended questions in questionnaires have been

316 criticized as they rarely 'meet the bar' for rigorous qualitative research.[46] Responses to open-ended

317 questions often lack context, emotional and social nuances, and layers of detail; they are private

318 opinions.[19] As context information is essential to developing the themes, we had to exclude the

319 responses lacking context, which means we might have missed relevant information. However, the

320 leading researcher (SM) in the labeling process knows the context well.

321 The generalizability of our results might be limited since this study was performed in the last

322 phase of the Covid-19 pandemic in the Netherlands. Hence, the dire circumstances and the employees'

323 need to work from home may have influenced the results. Our study is based on one survey conducted

324 in one hospital. However, it is the first study that we know of that systematically analyzes a large set of

325 comments on an open-ended question gathered at one single point in time. Because of the size of the

326 dataset and the participation of all the employees of this large university hospital, it is likely that other

327 employees of (university) hospitals worldwide will recognize the themes found in our study. We

328 welcome further studies in this direction.

329

15

CONCLUSION

330

331 Analyzing comments on the open-ended question of the CoCB-NL in one Dutch hospital, led us to

332 identify nine additional themes considered important by healthcare employees of their WE. WE suggest

333 that healthcare organizations should consider these themes to improve their employees' WE. They are

334 also useful input for further development of the Dutch version of the CoCB; even the original CoCB and

335 all its other translations. As WE is constantly changing and employees perceptions of their WE evolve

336 over time, we recommend analyzing comments on the open-ended question to ensure adequate

337 improvements in measuring WE. Ultimately such analysis contributes to a more positive WE for

338 personnel which in turn contributes to enhancing the quality of care. [6 7 44]

339

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344

16

345 **Author's contribution**: SM: conceptualisation; methodology; formal analysis; writing - draft. LS: formal

346 analysis; CvO: conceptualisation; supervision; methodology; formal analysis, writing – draft, review and

347 editing**.** AMW: conceptualisation; supervision; writing – review and editing; HV: supervison; writing –

348 review and editing.

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354

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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%

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Table 2: Factors, themes, descriptions & representative quotes

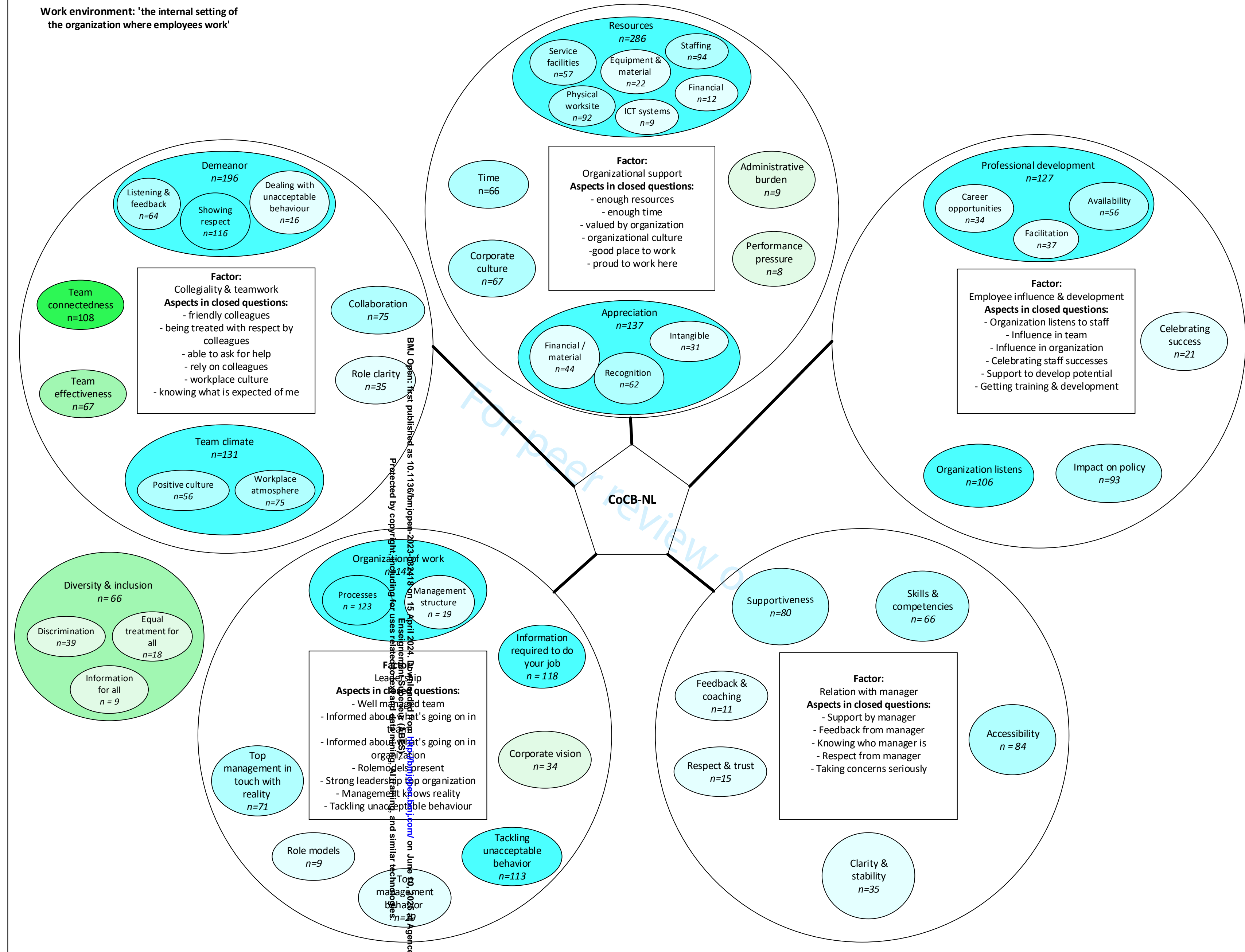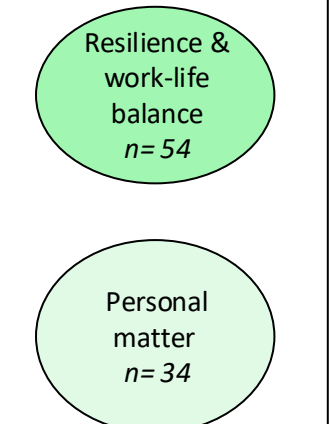| Themes belonging to CoCB-NL factors	Description	Representative quotes
Factor: organizational support		
Appreciation: Intangible	Non-physical recognition and appreciation of employees: e.g., a compliment, positive feedback or reinforcement.	*"Supervisors should express appreciation more often as well" (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)*

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	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.	"We often lack resources in the department. Think of blood pressure monitors, saturation meters, crutches or chairs." (r983) "The (sterile) supply cabinets should be better organized so that nurses can find things more easily." (r2813)
Resources: Financial	Financial resources needed to carry out tasks, directly associated with a stable budget or accounting systems.	"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) "More funding so we can replace equipment." (r11)
Resources: ICT systems	Availability of ICT systems, directly associated with supporting tasks.	"On both team management and technical level: we need policies for software version documentation, etc."(r72) "The computer systems are terrible. Decisions on software (which software, selected settings, etc.) are made centrally without taking users into account." (r821)
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 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) "Especially the temperature in the workplace. It's often very hot. [Not conducive to] working comfortably." (r961)
Resources: Service facilities	HR services and admin support needed in the hospital or at home.	"More support for remote work (monitor, desk, and chair). Also, access to a company psychologist when needed." (r2193) "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)
Resources: Staffing	The availability of personnel to efficiently execute tasks, associated with staff shortages or high turnover.	"More staff, so there's more time for patients and quality of care." (r408) "More effort to do tasks differently, like with a robot." (r1759)
Time	Time available for tasks, associated directly with enough time to do the job properly.	"Provide enough time to perform complex/time-consuming tasks. Requests often come in late, and time pressure is high." (r1207) "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)
Factor: employee influence & development		
Celebrating success	Coming together to celebrate achievements accomplished by the organization, teams, or individuals.	"Celebrating (shared) successes (e.g., cake, online lunches and drinks)."(r1189) "Pay attention to the 'small' successes of employees, not just the 'stars' who win the grants and awards." (r2724)
Impact on policy	Calls to "flip the pyramid from top-down to bottom-up" and having influence on policy prior to a change.	"Fewer top-down decisions from those who don't actually do the work." (r1217) "More authority for (small) decisions by staff members; not everything has to go through the Management Team" (r888)
Organization listens	A call to the organization without specifying who exactly to listen to employees, frequently associated with 'taking action on what employees request'.	"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)
Professional development: Availability	The availability of opportunities for education, workplace learning and professional and personal growth.	"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)
Professional development: Facilitation	Corporate support for education in terms of time, financial resources and/or intangible support	"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)
Professional development: Career opportunities	Future job perspective, job security and career development pathways toward promotion.	"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."(1181) "Try to give more opportunities. even outside of group, to support making a career in academia." (r2587)
Factor: relation with manager		

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Accessibility	Workplace manager is approachable, available and visible, communicates with staff and knows what is going on.	*"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)*
Clarity and stability	Clarity as to who the manager is, directly associated with changes and/or turnover in management.	*"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)*
Feedback & coaching	How a manager offers guidance, support, and constructive criticism to employees with the goal of improving professional development.	*"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)*
Respect & trust	Respect and trust the manager gives an employee as the basis of a positive and healthy working relationship.	*"A supervisor's respectful approach." (r393)* *"The director's trust in the advisers; recognizing them more as 'business partners'." (r1993)*
Supportiveness	Manager values employees' views and makes a sincere effort to address their concerns. Employees feel heard and understood.	*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)*
Skills and competencies	The knowledge, competences, and hard and soft skills that employees think their managers should possess.	*"Leadership course?" (r1242)* *"Recruit a strong knowledgeable leader who can drive the team forward." (r1745)*
Factor: leadership		
Top management behavior	The behavior, perceived attitude of the organization's top management.	*"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)*
Organization of work: management structure	The arrangement and structure of management and decision making	*"Clear leadership structure." (r1590)* *"Clearer hierarchical structures and responsibilities and authorities for different roles and tasks." (r1858)*
Organization of work: Processes	Workflow design and organization, e.g., consultation, arrangements, structure of sections, departments or organization, etc.	*"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)*
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.	*"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)*
Role models	The presence of role models to act as examples of good conduct/behavior.	*"Practice what you preach. Leading by example is so important." (r2033)* *"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)*
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 '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)* *" For both management and colleagues to address colleagues who exhibit behavior that is unacceptable toward students, if they hear or witness it happening." (r1435)*
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.	*"Senior/top management making informal visits to the work floor and interacting with employees." (r1841)* *"More understanding of the work from the top of the organization." (r632)*
Factor: collegiality & teamwork		

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

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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 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) "We nurses are exhausted and run down." (r2755)
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.	"Doing something fun together. Hopefully we can do that again soon." (r2217) "There needs to be more face-to-face conversation. All the remote work has created a significant distance between everyone." (r2398)
Team effectiveness	The ability of individuals working as a team to achieve goals efficiently. Subject to change as teams evolve and requires continuously attention.	"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) "More specific attention to the team process, preferably through external group training and coaching/evaluation." (r1079)

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Work environment: 'the internal setting of the organization where employees work'

The external setting

Legal frameworks and collective bargaining
n= 50

Resources
n=286

Service facilities
n=57

Equipment & material
n=22

Staffing
n=94

Physical worksite
n=92

ICT systems
n=9

Financial
n=12

Factor:
Organizational support
Aspects in closed questions:
- enough resources
- enough time
- valued by organization
- organizational culture
- good place to work
- proud to work here

Time
n=66

Corporate culture
n=67

Administrative burden
n=9

Performance pressure
n=8

Appreciation
n=137

Financial / material
n=44

Recognition
n=62

Intangible
n=31

Demeanor
n=196

Listening & feedback
n=64

Showing respect
n=116

Dealing with unacceptable behaviour
n=16

Team connectedness
n=108

Team effectiveness
n=67

Factor:
Collegiality & teamwork
Aspects in closed questions:
- friendly colleagues
- being treated with respect by colleagues
- able to ask for help
- rely on colleagues
- workplace culture
- knowing what is expected of me

Collaboration
n=75

Role clarity
n=35

Team climate
n=131

Positive culture
n=56

Workplace atmosphere
n=75

Professional development
n=127

Career opportunities
n=34

Facilitation
n=37

Availability
n=56

Factor:
Employee influence & development
Aspects in closed questions:
- Organization listens to staff
- Influence in team
- Influence in organization
- Celebrating staff successes
- Support to develop potential
- Getting training & development

Celebrating success
n=21

Organization listens
n=106

Impact on policy
n=93

CoCB-NL

Individual work related factors

Resilience & work-life balance
n= 54

Personal matter
n= 34

Diversity & inclusion
n= 66

Discrimination
n=39

Equal treatment for all
n=18

Information for all
n = 9

Organization of work
n=141

Processes
n = 123

Management structure
n = 19

Information required to do your job
n = 118

Corporate vision
n = 34

Factor:
Leadership
Aspects in closed questions:
- Well managed team
- Informed about what's going on in my team
- Informed about what's going on in organization
- Role models present
- Strong leadership top organization
- Management knows reality
- Tackling unacceptable behaviour

Top management in touch with reality
n=71

Role models
n=9

Top management behavior
n=29

Tackling unacceptable behavior
n=113

Supportiveness
n=80

Skills & competencies
n= 66

Feedback & coaching
n=11

Respect & trust
n=15

Factor:
Relation with manager
Aspects in closed questions:
- Support by manager
- Feedback from manager
- Knowing who manager is
- Respect from manager
- Taking concerns seriously

Accessibility
n = 84

Clarity & stability
n=35

Theme aligned with CoCB-NL n = < 51

Theme aligned with CoCB-NL n = > 50 < 100

Theme aligned with CoCB-NL n = > 100

New emerged themes n = < 51

New emerged theme n = > 50 < 100

New emerged theme n = > 100

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

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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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1

A systematic RADaR analysis of responses to the

2 # open-ended question in the Culture of Care

3 # Barometer survey of a Dutch hospital

4

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19

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1

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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

2

43 revealed important themes that not only require attention from healthcare organizations to ensure

44 adequate improvements in their employees' work environment, but should also be considered to

45 further develop the CoCB-NL.

46

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.

47

48 **Keywords:** work environment, health care organizations, equity and inclusion, human resources, RADaR

49 technique, Culture of Care Barometer, open comments

50

3

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

4

75 respondent agrees with the specific statement. (16) Although Likert-type scales are often used to

76 examine self-reported perceptions as they allow standardized and/or numerical information collection,

77 (17) the results presented can be difficult to interpret and translate into daily practice, especially when

78 seeking to improve the measured construct. (18) Furthermore, scale items are usually generated from

79 the underlying latent construct the scale developer aimed to measure. (17, 19) If certain topics are not

80 captured during the survey development, relevant items based on the latent construct may not be

81 addressed and could thus remain out of scope or be interpreted differently.

82   To tackle the potential loss of information when studying perceptions with closed-ended

83 questions, it is common to finish with an open-ended question at the end of the survey. (20) Hence, the

84 questionnaires frequently used by healthcare organizations contain such a question, for WE (e.g.,

85 Practice Environment Scale of the Nursing Work Index; (21) Essentials of Magnetism Tool; (22) Safety

86 Attitudes Questionnaire; (23) Hospital Survey on Patient Safety Culture (HSOPSC) (24)). Responses to

87 open-ended questions could offer valuable contextual information and provide indications and

88 directions for improvements. For example, Boussat et al. (24) found that responses to the open ended

89 question of the HSOPSC included necessary contextual information complementary to the HSOPSC

90 scores. Therefore, responses to open-ended questions could offer insights beyond numerical results.

91 (23) Although many questionnaires often give respondents the opportunity to comment on issues in the

92 open-ended question, (20) their answers are rarely reported in scientific publications. Researchers and

93 practitioners often face dilemmas in valuing and analyzing the open answers. (20) Due to the lack of

94 reports on these responses, the content of the questionnaire might not match the current opinions of

95 the respondents. Although it is common to establish survey validity and reliability, most validation

96 strategies occur within the framework of the statements and Likert-scale answers developed by the

97 researchers. (20) Hence, it is conceivable that shifts in perceptions over time are not captured,

98 particularly for constructs like WE that are multifaceted and subjective. (18)

5

99   We examined the content of answers given to the open-ended question in the Dutch Culture of

100   Care Barometer (CoCB-NL), (25, 26) a measurement tool to explore healthcare employees' perspectives

101   on their WE. The CoCB-NL found it origin in the CoCB, developed by Rafferty et al (25) and both showed

102   good validity and reliability in a previous studies. (25, 26) Therefore, the instrument has become part of

103   the annual employee survey of a university hospital. The CCB-NL assesses healthcare organizational WE

104   with 30 positively formulated items on five factors: 'organizational support', 'leadership', 'collegiality &

105   teamwork', 'relation with manager' and, 'employee influence and development'. (26) It concludes with

106   one open-ended question: "What, if any, action needs to be taken to improve the culture of care of your

107   work environment?"(25) By systematically analyzing the responses to this open-ended question we

108   aimed to examine 1) if the responses led to new insights or additional information on healthcare

109   employees' perceptions of their WE and 2) if any themes are missing in the CoCB-NL questionnaire. The

110   knowledge gained would be valuable for ongoing improvements to measuring and enhancing WE, a

111   prerequisite for attracting and retaining healthcare employees.

112

METHODS

Design

115   We conducted a qualitative analysis of comments responding to the open-ended question of the

116   validated CoCB-NL (26) using the RADaR (Rigorous and Accelerated Data Reduction) technique. (27)

117   RADaR is a systematic way of transforming raw textual data into manageable data tables fit for rigorous

118   analysis and concise presentation and therefore suitable for thematic analysis of large amount of

119   qualitative data, as was available in this study. (27) The reporting in this study complies with the

120   Standards of Reporting Qualitative Research (SRQS). (28)

Sample & setting

6

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**

7

144 Permission for utilizing the data in this study was granted by the owners of the anonymous data set: the

145 board of Erasmus MC University Medical Center Rotterdam). Study approval was obtained from the

146 Ethical Review Board of Erasmus MC University Medical Center Rotterdam (MEC-2023-0062). Collected

147 and stored in the Tilburg Repository, the pseudonymized study data is available upon request.

148 Study participation was anonymous and voluntary. Participants were informed about the study

149 in the announcement e-mail and on the first page of the questionnaire. Participants gave implicit

150 consent by proceeding to the substantive questions on the second page. Researchers only had access to

151 the output file of responses to the open-ended question. This file contained no information retrievable

152 to individuals such as email addresses or personnel identification numbers.

153 **Data analysis**

154 Data analysis involved five steps taken in three phases. In the first phase we built the database (table

155 format) and filled in all the data relevant to answering the research questions. Subsequently, comments

156 were given initial codes. The second phase reduced the collection by excluding, sorting and clustering

157 data, and refined the coding. Finally, themes were formulated in the third phase.

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

159 We began with a table containing all 2287 individual comments and codes labeling the five CoCB-NL

160 factors ('organizational support', 'leadership', 'collegiality & teamwork', 'relation with manager' and

161 'employee influence & development') as well as the topics related to the 30 closed-ended questions,

162 which we refer to as 'themes'. In the first step, two junior researchers (SM and LS) independently

163 labeled an initial group of 280 comments (12%) according to one or more factors and themes. A

164 comment that did not match any factor or theme was labeled 'other' and given a key word that fitted

165 the comment.

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

8

167 research team then discussed. In the second step, SM and LS independently coded the next 25% of

168 comments according to one or more themes. They compared the results (75% agreement) and

169 discussed differences up to consensus with a third – senior- researcher experienced in qualitative

170 research and an expert on healthcare employees' work environment (CvO). This resulted in the next

171 version of the code list which SM used to label the remaining 63% of the comments.

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

173 We began step three in the second phase by ordering the data table. If a comment referred to two or

174 more themes, it was split into multiple comments and assigned to the corresponding themes. Of 2915

175 comments in total, 501 comments referred to multiple issues, 391 comments addressed two themes, 97

176 addressed three themes, nine addressed four themes, and four comments addressed five themes. In

177 total 128 comments were excluded either because the respondents indicated that they had nothing to

178 add, found the questionnaire inappropriate, or had recently started their job and thought that they did

179 not known enough to be able to answer the questions. The final dataset contained 2787 comments

180 given by 2159 individual respondents.

181   SM reread the comments labeled to one of five CoCB-NL factors and subcategorized them in 24

182 themes. Two researchers (LS and CvO) crosschecked 70% of the labeling (82% agreement) and

183 suggested alternatives in the case of disagreement. The alternatives were discussed up to consensus by

184 CvO and AMW, two senior researchers in qualitative research. Then we wrote a first draft of theme

185 descriptions. The whole research team checked the descriptions of each theme several times for

186 consistency and comprehensibility. Several descriptions were altered and some themes were merged.

187   Subsequently, in the fourth step, SM reread, sorted and labeled the 'other' comments, which

188 resulted in the identification of nine additional themes. LS crosschecked all these comments (97%

189 agreement) and the whole research team discussed the results. This led to the exclusion of another 244

190 comments (total excluded n = 372) because they did not contain enough information for the researchers

9

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

192 communication' (r431)).

193 *Phase 3: Formulating the final themes – step 5*

194 In the final stage one researcher not involved in the coding/labeling process (AMW) reviewed the final

195 themes and descriptions for clarity and distinctiveness. Keeping the research questions in mind, then the

196 whole research team critically discussed the identified themes and further clustered the overlapping

197 themes. The final code list contained 33 themes, of which 24 were based on the closed-ended questions

198 of the CoCB-NL and nine were additional to the CoCB-NL.

199

200 **RESULTS**

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

202 **<please insert Table 1 about here>**

203

204 We analyzed 2915 comments, excluding 372 comments in total, based on the criteria 'lack of content'

205 (n=244), 'nothing to add' (n=104), question not appropriate' (n=13) and 'new in job' (n=11), a total of

206 372 comments are excluded. After exclusion the 2543 remaining comments are allocated to 33 themes.

207 In total, 2113 comments are labelled with 24 themes related to the five CoCB-NL factors and associated

208 close-ended questions, and 430 comments addressed additional themes (n=9). Figure 1 gives an

209 overview of the themes related to the CoCB-NL factors and the additional themes. Supplementary file 1

210 defines the themes.

211

212 **<please insert Figure 1 about here>**

213

10

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

11

238 covered by the associated closed-ended questions. The themes 'team connectedness' (n=108) and

239 'team effectiveness' (n=67), relate to teamwork and are therefore assigned to 'collegiality & teamwork'.

240 However, 'team connectedness' and 'team effectiveness' refer to belonging to a team, something that

241 many team members lacked as they were not allowed to meet physically during the Covid-19 pandemic.

242 Respondents mentioned a need for a clear vision and goals to provide direction for their department

243 (factor 'leadership', theme 'corporate vision'; n=34). Furthermore, respondents called for action by the

244 organization and (higher) management on the persistent 'administrative burden' (n=9) and

245 'performance pressure' (n=7).

246 We identified four distinct themes that cannot be allocated to the factor structure of the CoCB-

247 NL: 'diversity & inclusion', 'resilience & work-life balance', 'personal matter', and 'legal frameworks and

248 collective bargaining' (Figure 1). The theme 'diversity and inclusion' (n=66) is based on respondents'

249 comments on gender, ethnicity, language and ability differences, and encompasses three sub-themes:

250 'discrimination' (n=39), 'equal treatment of all' (n=18) and 'information for all' (n=9). The theme

251 'resilience & work-life balance' (n=54) includes comments on requested resilience of employees, mental

252 health issues' and constraints due to a disturbed work-life balance. The comments labeled 'personal

253 matter' (n=34) includes comments on positive or negative experiences with the workplace. The theme

254 'legal frameworks and collective bargaining' (n=50) concerns external conditions and includes comments

255 on how respondents feel about conditions imposed by legislation or the collective bargaining

256 agreement, such as salary, working hours or aging policy.

257

258 **DISCUSSION**

259 Our study had two aims. First, to determine if the responses to the open-ended question in the CoCB-NL

260 survey of a Dutch university hospital would lead to new insights into healthcare employees' perceptions

261 of their WE. Second, to evaluate if any identified themes differed from those addressed by the CoCB-NL.

12

262   We identified 33 themes, of which 24 correspond directly with the close-ended questions of the

263   CoCB-NL and nine themes that the CoCB-NL does not address. The 24 corresponding themes include

264   almost all the elements of the Dutch CoCB-NL and the original CoCB, (25, 26) which shows the relevance

265   of using this tool to measure the WE.

266   Of the nine additional themes we distinguished, five relate to factors of the COCB-NL: 'team

267   connectedness', 'team effectiveness', 'corporate vision', 'administrative burden' and 'performance

268   pressure'. The remaining four themes are: 'diversity & inclusion', 'resilience & work-life balance',

269   'personal matter', and 'legal frameworks and collective bargaining'. Except for 'resilience & work-life

270   balance', 'personal matter', and 'legal frameworks and collective bargaining', all concern the employees'

271   experience of their work environment. They are known elements of the healthcare employees' WE that

272   have an effect on patient or personnel outcomes. (5, 13, 33) Hence, adding these six themes to the

273   COCB-NL, or the original CoCB (25) and other translations (34) should be considered.

274   The themes 'team connectedness' and 'team effectiveness' emerged from comments on the

275   employee's experiences during the Covid-19 pandemic. While working at home and meeting only online,

276   employees found it hard to connect with team members and be effective as a team. However, after the

277   pandemic, working remotely (from home) has become the 'new normal' for employees not providing

278   direct patient care. (35, 36) Therefore, our findings show the importance for healthcare organizations to

279   understand the influence on WE on remote working. More research in this direction is needed. Also, the

280   theme 'legal frameworks and collective bargaining' was mentioned quite often. The comments referred

281   especially to the collective bargaining agreements, which were under debate at the time the survey was

282   conducted. (37) Although these results can be attributed to a specific event or point in time, it is

283   important to consider measuring 'team connectedness', ' team effectiveness' and 'legal frameworks and

284   collective bargaining' as part of the WE as both patient and personnel outcomes benefit from team

285   connectedness and effectiveness. (38, 39) Also, external conditions or structures, such as a law

13

286   regulating working hours, influence the employee roster, which in turn affects the work-life balance of

287   the individual professional and foster employees' concerns. (40, 41) Healthcare organizations should

288   take these concerns seriously.

289   The distinct theme 'diversity & inclusion' was not related to any factor of the CoCB-NL. Diversity

290   and inclusion in organizations is associated with corporate performance in terms of innovation, profit,

291   and personnel engagement and retention. (42) An inclusive WE is diverse in composition and originates

292   in a climate where employees are willing to speak out and participate, and unacceptable behavior is less

293   prevalent. (43) Recent government-indicated research concluded that the Dutch healthcare sector does

294   not have a diverse workforce that reflects society. (44) Healthcare organizations are urged to continue

295   working toward a more diverse and inclusive WE. (42, 44) Although the importance of a diverse and

296   inclusive WE is evident, we are not aware of any instrument measuring the diversity and inclusivity of

297   healthcare employees' WE. (15, 16)

298   Respondents did not address two CoCB-NL items in the open-ended question: 'a good place to

299   work' and 'proud to work'. These two are addressed by the closed-ended questions, so it cannot be said

300   that they do not contribute to a positive WE and could, therefore, be considered as positive outcomes.

301   (13) It is important to remain critical of questionnaire items. New themes require adaptation of the

302   CoCB-NL, but it is known that long questionnaires are detrimental to low response rates. (45)

303   The fact that our study found nine new themes important to healthcare employees' WE

304   confirms the value of analyzing open comments in questionnaires. (20, 46) These new themes provide

305   context to the WE measured and prove that new perceptions on the WE can be captured. Hence,

306   analysis of open-ended questions serves as a starting point for discussing our results. (20, 46) Moreover,

307   the WE is in constant flux due to changing circumstances (e.g., due to Covid-19 or negotiating a

308   collective bargaining agreement) so what employees find crucial elements of WE evolves over time. (16,

309   47) Analyzing open-ended questions facilitates improvements that align with employees' experiences

14

310   and requirements. (20, 46) To use responses to open-ended questions, the responses ought to contain

311   sufficient contextual information on experiences with the WE. Given the substantial proportion of

312   excluded responses in our data set, future research should highlight the importance of providing rich

313   responses to open-ended questions that include information on context.

314   **Strengths & limitations**

315   Analyses of responses to open-ended questions have been criticized as they rarely 'meet the bar' for

316   rigorous qualitative research and hence, a rigorously method is recommended. (20, 48) A strength of our

317   study is the application of RADaR (27) technique to systematically analyze and quantify the large amount

318   of comments on the open-ended question of the CoCB-NL. Moreover, to avoid the risk of missing hidden

319   themes with RADaR only (49), at least two junior researchers performed the data analysis by

320   independently allocating comments to themes. Additionally, responses to open-ended questions often

321   lack context, emotional and social nuances, and layers of detail; sometimes these are private opinions.

322   (20) As context information is essential to developing themes, we had to exclude the responses lacking

323   context, which means we might have missed relevant information. However, the leading researcher

324   (SM) in the labeling process knows the hospital context well.

325   This study is based on data from a single survey conducted in a university hospital during a

326   specific point in time. The strength is the substantial size of the dataset, and the inclusion of all

327   employees in this large university hospital. However, there is a risk of response bias in this survey, as

328   only 42% of employees responded of which 37% responded to the open-ended question. This might

329   impact the generalizability of our findings to other (university) hospitals worldwide. Additionally the

330   study was performed in the last phase of the Covid-19 pandemic in the Netherlands. Hence, the dire

331   circumstances and the employees' need to work from home may have influenced the results. Because of

332   the size of the dataset and the participation of all the employees of this large university hospital, it is

15

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)

340

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)

350

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356 analysis; CvO: conceptualisation; supervision; methodology; formal analysis, writing – draft, review and

357 editing**.** AMW: conceptualisation; supervision; writing – review and editing; HV: supervision; review.

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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%

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490 **Figure 1:** Factors and (sub)themes

21

Work environment: 'the internal setting of the organization where employees work'

The external setting

Legal frameworks and collective bargaining
n= 50

Resources
n=286

Service facilities
n=57

Equipment & material
n=22

Staffing
n=94

Physical worksite
n=92

ICT systems
n=9

Financial
n=12

Factor:
Organizational support
Items in closed questions:
- enough resources
- enough time
- valued by organization
- organizational culture
- good place to work
- proud to work here

Time
n=66

Corporate culture
n=67

Administrative burden
n=9

Performance pressure
n=8

Appreciation
n=137

Financial / material
n=44

Recognition
n=62

Intangible
n=31

Demeanor
n=196

Listening & feedback
n=64

Showing respect
n=116

Dealing with unacceptable behaviour
n=16

Team connectedness
n=108

Team effectiveness
n=67

Factor:
Collegiality & teamwork
Items in closed questions:
- friendly colleagues
- being treated with respect by colleagues
- able to ask for help
- rely on colleagues
- workplace culture
- knowing what is expected of me

Collaboration
n=75

Role clarity
n=35

Team climate
n=131

Positive culture
n=56

Workplace atmosphere
n=75

Professional development
n=127

Career opportunities
n=34

Facilitation
n=37

Availability
n=56

Factor:
Employee influence & development
Items in closed questions:
- Organization listens to staff
- Influence in team
- Influence in organization
- Celebrating staff successes
- Support to develop potential
- Getting training & development

Celebrating success
n=21

Organization listens
n=106

Impact on policy
n=93

Diversity & inclusion
n= 66

Discrimination
n=39

Equal treatment for all
n=18

Information for all
n = 9

CoCB-NL

Organization of work
n=141

Processes
n = 123

Management structure
n = 19

Factor:
Leadership
Items in closed questions:
- Well managed team
- Informed about what's going on in the team
- Informed about what's going on in organization
- Rolemodels present
- Strong leadership top organization
- Management knows reality
- Tackling unacceptable behaviour

Information required to do your job
n = 118

Corporate vision
n = 34

Top management in touch with reality
n=71

Role models
n=9

Top management behavior
n=80

Tackling unacceptable behavior
n=113

Supportiveness
n=80

Skills & competencies
n= 66

Feedback & coaching
n=11

Respect & trust
n=15

Factor:
Relation with manager
Items in closed questions:
- Support by manager
- Feedback from manager
- Knowing who manager is
- Respect from manager
- Taking concerns seriously

Accessibility
n = 84

Clarity & stability
n=35

Individual work related factors

Resilience & work-life balance
n = 54

Personal matter
n = 34

Theme aligned with CoCB-NL n = < 51

Theme aligned with CoCB-NL n = > 50 < 100

Theme aligned with CoCB-NL n = > 100

New emerged themes n = < 51

New emerged themes n = > 50 < 100

New emerged theme n = > 100

Themes belonging to CoCB-NL factors	Description	Representative quotes
Supplementary file 1: Factors, (sub)themes, descriptions & 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 of fear, lack of accountability, pride or a psychologically safe environment	*"Less accountability culture. Room to make mistakes."(r670)* *"[Department X] still has a clear, hopefully unconscious, hierarchical culture"(r2111)*
Resources: Equipment & material*	Equipment and materials needed to carry out tasks: e.g., bandages or a patient-monitoring system.	*"We often lack resources in the department. Think of blood pressure monitors, saturation meters, crutches or chairs." (r983)* *"The (sterile) supply cabinets should be better organized so that nurses can find things more easily." (r2813)*
Resources: Financial*	Financial resources needed to carry out tasks, directly associated with a stable budget or accounting systems.	*"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)* *"More funding so we can replace equipment." (r11)*
Resources: ICT systems*	Availability of ICT systems, directly associated with supporting tasks.	*"On both team management and technical level: we need policies for software version documentation, etc."(r72)* *"The computer systems are terrible. Decisions on software (which software, selected settings, etc.) are made centrally without taking users into account." (r821)*
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 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)* *"Especially the temperature in the workplace. It's often very hot. [Not conducive to] working comfortably." (r961)*
Resources: Service facilities*	HR services and admin support needed in the hospital or at home.	*"More support for remote work (monitor, desk, and chair). Also, access to a company psychologist when needed." (r2193)* *"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)*
Resources: Staffing*	The availability of personnel to efficiently execute tasks, associated with staff shortages or high turnover.	*"More staff, so there's more time for patients and quality of care." (r408)* *"More effort to do tasks differently, like with a robot." (r1759)*
Time	Time available for tasks, associated directly with enough time to do the job properly.	*"Provide enough time to perform complex/time-consuming tasks. Requests often come in late, and time pressure is high." (r1207)* *"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)*
Factor: employee influence & development		
Celebrating success	Coming together to celebrate achievements accomplished by the organization, teams, or individuals.	*"Celebrating (shared) successes (e.g., cake, online lunches and drinks)."(r1189)* *"Pay attention to the 'small' successes of employees, not just the 'stars' who win the grants and awards." (r2724)*
Impact on policy	Calls to "flip the pyramid from top-down to bottom-up" and having influence on policy prior to a change.	*"Fewer top-down decisions from those who don't actually do the work." (r1217)*

		"More authority for (small) decisions by staff members; not everything has to go through the Management Team" (r888)
Organization listens	A call to the organization without specifying who exactly to listen to employees, frequently associated with 'taking action on what employees request'.	"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)
Professional development: Availability*	The availability of opportunities for education, workplace learning and professional and personal growth.	"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)
Professional development: Facilitation*	Corporate support for education in terms of time, financial resources and/or intangible support	"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)
Professional development: Career opportunities*	Future job perspective, job security and career development pathways toward promotion.	"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."(1181) "Try to give more opportunities. even outside of group, to support making a career in academia." (r2587)
Factor: relation with manager		
Accessibility	Workplace manager is approachable, available and visible, communicates with staff and knows what is going on.	"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)
Clarity and stability	Clarity as to who the manager is, directly associated with changes and/or turnover in management.	"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)
Feedback & coaching	How a manager offers guidance, support, and constructive criticism to employees with the goal of improving professional development.	"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)
Respect & trust	Respect and trust the manager gives an employee as the basis of a positive and healthy working relationship.	"A supervisor's respectful approach." (r393) "The director's trust in the advisers; recognizing them more as 'business partners'." (r1993)
Supportiveness	Manager values employees' views and makes a sincere effort to address their concerns. Employees feel heard and understood.	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)
Skills and competencies	The knowledge, competences, and hard and soft skills that employees think their managers should possess.	"Leadership course?" (r1242) "Recruit a strong knowledgeable leader who can drive the team forward." (r1745)
Factor: leadership		
Top management behavior	The behavior, perceived attitude of the organization's top management.	"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)
Organization of work: management structure*	The arrangement and structure of management and decision making	"Clear leadership structure." (r1590) "Clearer hierarchical structures and responsibilities and authorities for different roles and tasks." (r1858)
Organization of work: Processes*	Workflow design and organization, e.g., consultation, arrangements, structure of sections, departments or organization, etc.	"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)
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.	"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)
Role models	The presence of role models to act as examples of good conduct/behavior.	"Practice what you preach. Leading by example is so important." (r2033)

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

Performance pressure	The perceived pressure to perform and produce, e.g., 'publish or perish' or meet production targets.	*"Academic competitiveness can be challenging. The pressure to secure funding and publish is quite high and can be difficult." (r451)* *"Performance pressure is high, the standard is high, and competition among staff is palpable." (r2611)*
Personal matter	An individual's opinion of workplace conditions or of the organization, so personal that it cannot be classified under any other category.	*"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)* *"More understanding and insight into long-stay COVID, what it does to your body and your psychological functioning."(r750)*
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 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)* *"We nurses are exhausted and run down." (r2755)*
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.	*"Doing something fun together. Hopefully we can do that again soon." (r2217)* *"There needs to be more face-to-face conversation. All the remote work has created a significant distance between everyone." (r2398)*
Team effectiveness	The ability of individuals working as a team to achieve goals efficiently. Subject to change as teams evolve and requires continuously attention.	*"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)* *"More specific attention to the team process, preferably through external group training and coaching/evaluation." (r1079)*

*subthemes

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

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