Adapting to the unexpected: Problematic work situations and resilience strategies in healthcare institutions during the COVID-19 pandemic's first wave

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ABSTRACT

The COVID-19 pandemic's first wave required considerable adaptation efforts on the part of healthcare workers. The literature on resilient healthcare describes how the collective regulation strategies implemented by frontline employees make essential contributions to institutions' abilities to cope with major crises. The present mixed-methodology study was thus conducted among a large sample of employees in a variety of Swiss healthcare institutions and focused on problematic real-world situations experienced by them and their managers during the pandemic's first wave. It highlighted the anticipatory and adaptive strategies implemented by institutions, teams and individuals. The most frequently cited problematic situations involved organisational changes, interpersonal conflicts and workloads. In addition to the numerous top-down measures implemented by institutions, respondents also identified personal or team regulation strategies such as increasing staff flexibility, prioritising tasks, interprofessional collaboration, peer support or creating new communication channels to families. The present findings underlined the importance of taking greater account of healthcare support staff and strengthening managerial capacity to support interprofessional teams including those support staff.

1. Introduction

From early 2020, the coronavirus disease (COVID-19) pandemic presented Switzerland's healthcare institutions with several major challenges, forcing them to reinvent their practices extremely quickly. Shortages of personal protective equipment (PPE) represented significant difficulties (Slotkin et al., 2020). Reduced staff availability hindered routine activities (Sarma et al., 2020). Workers' mental well-being was under severe strain (Dubey et al., 2020; Amin, 2020; Fernandez et al., 2020; Lai et al., 2020). Exposure to COVID-19 cases in hospitals, the death of severely ill patients and fears of infecting relatives all negatively affected healthcare workers (Amin, 2020; Greenberg et al., 2020). Rarely used healthcare policies, such as quarantine and patient triage, the implementation of various protective measures, widespread

respirator use and new communication technologies were additional stress factors (Amin, 2020; Greenberg et al., 2020). Moreover, the lack of clear, existing protocols did not allow professionals to work as efficiently and satisfactorily as desired (Fang et al., 2020; Sarma et al., 2020; Slotkin et al., 2020). Furthermore, the pandemic may have had a negative impact on the overall quality of care worldwide because of the greater numbers of patients and overloaded, overwhelmed hospitals providing care with fewer resources than usual (Baker et al., 2020)

The literature shows that self-regulation strategies—implemented by frontline workers dealing with disruptions in their usual activities—play a crucial role in the organisational resilience of institutions facing major crises (Cuvelier and Falzon, 2010; Kruk et al., 2015; Lane and McGrady, 2018). However, there is as yet little information on the problematic real-world situations encountered by healthcare personnel in the context

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of the pandemic or on their collective self-regulation strategies helping to support organisational resilience. The present study aimed to address this knowledge gap by identifying the main disturbances experienced by healthcare workers in Switzerland during the pandemic's first wave and their ensuing regulation strategies.

2. Conceptual framework

Resilience refers to the processes and capacities that enable individuals, or human, technical or natural systems, to overcome, resist, adapt to and recover from deep crises. Resilience is used in disciplines as diverse as psychology (Werner and Smith, 1977), ecology (Holling, 1973), public health (Barasa et al., 2018), organisational sciences (Vogus and Sutcliffe, 2007; Weick and Sutcliffe, 2001) and, among these, human factors and ergonomics (Hollnagel et al., 2006). The present research was based on the concept of resilient healthcare developed by Anderson et al. (2020). This concept refers to healthcare systems' ability to remain stable during and after crises, maintaining normal operations under both predictable and unpredictable conditions. Healthcare institutions often operate in a state of tension between the demands for care and available resources (Back et al., 2017). A health crisis exacerbates this tension and generates imbalances that lead decision-makers and frontline staff to adapt their activities, improvise solutions and make compromises. These adaptations lead to divergences between the "work as done" and "work as imagined" (i.e. procedures and protocols). Understanding these differences is at the core of studies on organisational resilience (Barasa et al., 2018). Indeed, procedures are not always sufficient or appropriate as they cannot anticipate every possible situation. Therefore, organisations' improvement efforts should focus on enhancing adaptive capacity (Anderson et al., 2020).

According to Hollnagel (2018), resilience relies on four processes: anticipating, monitoring (detecting), responding and learning. Based on these processes, Anderson et al. (2020) proposed a systemic model of resilient healthcare: the Integrated Resilience Attributes Framework. The model suggests that resilience can be observed using three scales of time and space. *Situated resilience* refers to the management of unexpected events at a micro-level (*e.g.* patient flows or equipment malfunctions); coping with these situations requires pre-existing sociotechnical resources and practices (skills, knowledge, tools, data, etc.). *Structural resilience* is the process of reviewing and redesigning these resources and practices to better support work activities; it takes place at a higher, meso level (*e.g.* redesigning a surgical checklist, planning staffing and equipment, etc.). Finally, *systemic resilience* involves completely reformulating how sociotechnical resources and practices are produced and organised, by political and administrative authorities, professional bodies and other institutional actors, at the macro-level of a whole industry or healthcare system and over an extended period.

The present study focused on situated and, to a lesser extent, structural resilience. It relied on identifying the problematic situations that indicate discrepancies between needs and capacities, as well as the adaptive measures that teams implement to reduce them. Indeed, human factors and ergonomics emphasize the importance of the quality of collaboration within teams of employees. Discussions between colleagues contribute to anticipating and detecting problems before their negative consequences become apparent. They also foster the dissemination of knowledge and skills, the development of shared situational awareness and the redefinition of workplace rules for dealing with the unexpected (Caroly and Barcellini, 2015; Couix, 2010; Cuvelier and Falzon, 2010; Weick and Sutcliffe, 2001).

In summary, this study was based on the idea that, faced with the problematic situations engendered by the pandemic, employees would actively seek to self-regulate their working activities to balance demands and resources as much as possible. These changes have a collective dimension: they lead to the redefinition of work rules within teams. The study sought to contribute to a better understanding of the problematic,

pandemic-related situations that healthcare teams were facing and of emerging resilience processes. In this context, the research questions were:

(a) What problematic situations did employees in healthcare institutions face in their daily activities in the context of the COVID-19 pandemic's first wave?
(b) What resilience strategies did individual healthcare staff, teams and institutions implement to anticipate and adapt to these situations?

3. Methods

3.1. Design

This qualitative evaluation was part of a large, longitudinal study that included several self-administered online questionnaires. The present paper relies on a subset of mostly open-ended questions.

3.2. Sampling

The convenience sample consisted of all the staff of a university hospital in French-speaking Switzerland: healthcare staff, support staff, frontline staff and administrative staff. The sample was supplemented with employees from other institutions: nursing staff and educators at an institution for disabled persons, caregivers from a regional hospital, nursing staff and students in nursing sciences at the University of Applied Sciences and Arts Western Switzerland, in-house instructors working in healthcare institutions in several Swiss cantons and nurses participating in continuing education courses. Individuals who fell into one of the above categories and had sufficient knowledge of French were eligible for inclusion in the sample.

3.3. Data collection

Study data were collected and managed using REDCap (Research Electronic Data Capture), a secure, web-based software platform designed to support data capture for research studies (Harris et al., 2019). Potential participants received an email explaining the study and inviting them to participate. Respondents participated by voluntarily clicking on the link in the email, and they were allowed to complete the questionnaire during their working time.

3.4. Instrument

The subset of questions on which this paper is based (Table 1) included an open-ended question on a problematic situation experienced by the respondent, slightly adapted from the validated Working Conditions and Control Questionnaire (Hansez, 2008). Two other open-ended questions were created to explore the anticipatory and adaptive measures implemented by healthcare teams in response to that problematic situation. The questionnaire also included a quantitative question on the severity of the situation described. Finally, it requested data on sex, institution size, profession, department or sector of activity, and hierarchical status.

3.5. Data analysis

3.5.1. Coding problematic situations

A thematic analysis of the problematic situations encountered was carried out as follows. Two researchers (SCK and TMJ) independently read all the statements and created categories for them. These were then compared to check their degrees of similarity and relevance, and a single, final, two-level list was developed. Level-1 codes (L1) consisted of 10 general categories, and level-two codes (L2) consisted of 29 more detailed subcategories (Table 2). The first 100 statements were double-

Table 1

Questionnaire items on problematic situations, anticipation, adaptation and severity (a subset of the survey instrument).

Dimensions	Questions
Problematic real-world situation	The questions below relate to a problematic, real-world situation that you or your team may have encountered during your work, either in direct or indirect connection with COVID-19 (*e.g. patient care, work organisation, team dynamics, technical and material aspects, etc.*). *If the person indicated that they had experienced this kind of situation in recent months:* Please describe this situation here:
Anticipation of the situation	The following questions deal with your team's anticipation of this situation (*set of six closed questions, including the conditional question below*). Had steps been taken to address this situation? Yes/ rather yes/rather no/no If yes or rather yes, what were these measures?
Adaptation to the situation	The questions below focus on how your team has adapted to the situation (*set of 16 closed questions on, e.g. prioritising tasks, changing operating procedures or developing innovative ways of working, followed by the open question below*). What other adaptations did the team make to deal with this situation?
Consequences of the situation	On a scale of 1 to 10, how severe do you consider this situation to have been, for yourself, for the team and for patients? (1 = mild, 5 = neutral, 10 = very severe)

coded to ensure internal validity. All subsequent responses were coded by a single researcher (TMJ).

3.5.2. Coding of anticipatory and adaptive measures

Open-ended questions regarding the anticipatory and adaptive measures used by teams were dealt with using the same process. A single-level code was created for each question, with 14 categories of anticipatory measures and 18 categories of adaptive measures.

3.5.3. Analyses

Statistical analyses were performed using SPSS (IBM Corp. Released 2019. IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY: IBM Corp). Chi-squared statistical tests were performed to explore relationships between institutional and personal characteristics on the one hand and the problematic level-1 and level-2 situations on the other. Statistical significance was set at $p < 0.05$.

3.5.4. Ethical considerations

The overall project was submitted to and approved by Geneva's Regional Research Ethics Committee. It adhered to Swiss legal requirements, the latest version of the World Medical Association's Declaration of Helsinki, and the principles and procedures for integrity in scientific research involving human beings. Participants gave their informed consent by clicking on a "Yes" button before starting the survey.

4. Results

4.1. Sample

In total, 15,272 people were invited to take part in the study and 4,773 (31.3%) participated by responding to the questionnaire. Of the participants, 89.5% were employed at the university hospital and 76.6% were women. More than half (56%) of the respondents were nurses, healthcare assistants and auxiliary nurses. A quarter (28.3%) of respondents had a managerial role. Thirty-three per cent were less than 40 years old, 32% were from 40 to 50 years old and 35% were more than 50 years old. The sample covered a wide range of hospital and non-hospital sectors. Only 10.1% of respondents reported working in a COVID-19 ward. A detailed description of respondents, institutions and

Table 2

Two-level classification of problematic situations (percentage and number of respondents).

Type of problematic situation: level 1 (L1) and level 2 (L2)	%	N = 1,292
Organisational Change	**40.6**	**525**
Reorganisation of services, tasks or planning; material and human logistics	17.3	223
Unusual activities and adaptations (new services, novelties)	15.6	201
Lack of space, room reorganisation, new distribution of care units	11.3	146
Flow management and patient transferrals	7.7	99
Splitting and building of new teams	7.0	90
Working in an emergency and necessity to make quick changes	5.2	67
Workloads and work schedules (overloads and under-utilisation)	**27.6**	**356**
Work overload: quantity, duration or understaffing	9.8	127
Irregular or constantly modified schedules	9.6	124
Sick leave, absences or staff reassignments	7.4	96
Lack of work, closed wards or cancellation/deprogramming of activities	7.3	94
Lack of breaks, holidays or or rest; uncompensated overtime	5.4	70
Work–life balance tensions; childcare difficulties	0.9	12
Conflictual relationships	**23.5**	**303**
Hierarchical tensions, lack of support, lack of recognition	8.4	109
Tensions within teams	7.5	97
Tensions with patients and families: stress and emotion management	6.0	78
Managerial difficulties from team complaints and stress	5.2	67
Patient care practices and quality of care perceptions	**17.2**	**222**
Patients' critical conditions, deaths, ethical issues	8.4	109
Disagreements, incoherencies or worries about patient care	6.7	87
Patients isolated from families	5.2	67
Emotional burden: fear, distress, loneliness, etc.	**16.8**	**217**
Fear of contamination by patients or peers	9.2	119
Feelings of inequality	3.9	50
Fear of contaminating relatives or them being infected by others	3.8	49
Stigmatisation, feelings of guilt (working with COVID-positive patients, absenteeism due to vulnerability or sickness, working from home), feelings of uselessness	1.5	19
Lack of information, communication or training	**15.6**	**201**
Unclear instructions and lack of information	9.4	122
Difficult communication and inter-/intra-professional cooperation	6.3	81
Lack of training and skills	3.7	48
Difficulties with COVID-19 guidelines and protection measures	**13.1**	**169**
Difficulties respecting the rules and protective measures due to lack of understanding, time, desire or differing interpretations	10.7	138
Constant changes to guidelines and ensuing adaptations	4.6	59
Access to COVID-19 PPE and equipment for patient care	**11.3**	**146**
Complexity of working from home (the setting and technical issues)	**1.2**	**93**
Others, non-codable or off-topic	**3.8**	**49**

departments is available in the supplementary material.

4.2. Classification of problematic situations

Of 4,773 participants, 1,292 described a problematic situation. Significant relationships were found between level-1 problematic situations and the variables of profession (khi^2 = 293.799, df = 40, $p < .001$), hierarchical status (khi^2 = 31.924, df = 20, $p < .05$), department (khi^2 = 301.123, df = 99, $p < .05$), and COVID/non-COVID ward (khi^2 = 41.331, df = 10, $p < .001$). Significant relationships were found between level-2 problematic situations and hierarchical status (khi^2 = 525.716, df = 152, $p < .001$). The main relationships are summarised in Table 3.

There was a significant relationship between profession and the estimated level of the severity of problematic situations (khi^2 = 26,748, df = 10, $p < .01$). Administrative staff were more likely to consider situations as not very severe (40.4%). Medical technicians, medical therapists and sociomedical staff were more likely to consider situations

Table 3

Statistically significant differences between level-1 and level-2 problematic situations and demographic variables.

Level-1 problematic situations*	Profession	Departments	Hierarchical Status	COVID/non-COVID wards	Perceived severity of the issue
Organisational Change (40.6%)	*n. s.*	More frequent in surgical depts (59.2%) Less frequent in non-hospital institutions (34.8%)	*Subcategory of "Services, tasks, planning reorganisation and logistics":* more frequently reported by senior managers (32%) than staff without managerial roles (14.9%)	*n. s.*	*n. s.*
Workloads (overload and under-utilisation) and work schedules (27.6%)	*n. s.*	More frequent in the diagnostics depts (50%) Less frequent in rehabilitation/geriatrics wards (22.6%)	*Subcategory of "Absences–mobilisation":* more frequently reported by senior managers (14.5%) than staff without managerial roles (6.3%)	More frequent in non-COVID wards (29.3%) than in COVID wards (20.5%)	*n. s.*
Conflictual relationships (23.5%)	*n. s.*	*n. s.*	*Subcategory of "Management difficulties, team complaints, and stress":* more frequently reported by senior (16.1%) and middle managers (10%) than by staff without managerial roles (2.3%)	*n. s.*	*n. s.*
Patient-care practices and quality of care (17.2%)	More frequent among nurses, healthcare assistants and auxiliary nurses (23.6%) and among doctors (18.0%) than among other professions	More frequent in women, children, and adolescent depts (29.7%), acute medicine (29.4%), rehabilitation/geriatrics (18.9%), and general medicine (18.2%) Less frequent in management and general services (4.4%), facility services (2.7%), and diagnostics (2.1%)	*n.s.*	More frequent in COVID wards (23.9%) than in non-COVID wards (16.2%)	More often considered as severe by doctors (47.8%)
Difficulties with COVID-19 guidelines and protection measures (13.1%)	*n. s.*	*Subcategory of "Difficulties respecting the rules and protective measures":* more frequent in the mental health and psychiatry depts	*n. s.*	*n. s.*	*n. s.*
Emotional burden (16.8%)	More frequent among nurses, healthcare assistants and auxiliary nurses (18.4%) Less frequent for doctors (7.8%)	*n. s.*	*n. s.*	*n. s.*	*n. s.*
Lack of information/communication/training (15.6%)	*n.s.*	More frequent in acute medicine (23.5%) and medical specialities (23.2%) Less frequent in non-hospital institutions (7.1%)	*n. s.*	More frequent in COVID wards (30.8%) than in non-COVID wards (13%)	More often considered moderately severe (41.9%)
Access to COVID-19 PPE and equipment for patient care (11.3%)	More frequent among logistical, technical, maintenance and catering staff (16.3%) and among nurses, healthcare assistants and auxiliary nurses (13%) Less frequent among administrative staff (4%)	More frequent in rehabilitation/geriatrics (20.8%) Less frequent in women, children and adolescent depts (4.7%)	*n. s.*	*n. s.*	More often considered severe (43.5%)
Working from home: the setting and technical issues (7.2%)	More frequent among administrative staff (33.3%) than among all other professions.	More frequent in management and general services (25.7%) than in other depts.	More frequent among senior managers (13.7%); less frequent among staff without managerial roles (6.9%) and middle managers (5.5%)		More often considered not very severe (41.9%)

* Category "Difficulties with COVID-19 guidelines and protection measures (13.1%)" not included as no significant relationship was found. *n.s.*: not significant.

to be of medium severity (41.8%). Logistical, technical, maintenance, cleaning and catering staff were more likely to consider situations as severe (46.8%). There was also a significant relationship between department and estimated severity level (khi^2 = 40,770, df = 26, $p <$ .05). Situations were more often considered severe in acute medicine and the facility services department (50%) and less severe in primary care medicine (40%) and oncology units (47.4%). Each level-one problematic situation is described below using its level-two constituents and real-world examples from the qualitative data.

4.2.1. Organisational changes (40.6% of respondents)

The most frequent problematic situations related to COVID-19 involved organisational change. Services, tasks and planning had to be reorganised, as did logistics and stock management (17.3%). One

manager experienced "the rushed opening of a new unit in a short time period. Managing and setting up a team, with all the logistics that this engenders, was very stressful for me." This situation was more frequently reported by senior managers (32%) than employees without a managerial role (14.9%).

Unusual activities forced employees to adapt to new tasks and to work in other wards and units (15.6%). Spaces and units were reorganised, and some employees had to work on a different site (5.0%). One technician explained how he had to modify "thousands of square meters and rooms in a hurried and sudden way in order to restructure and readapt areas available for care." Usual patient (both COVID and non-COVID) flows were modified (7.7%). Some teams were broken up, and some employees had to work with new colleagues, which changed relationship dynamics (7%). Finally, working in a hurry and adapting to

change in a very short time were also reported (5.2%).

Organisational changes were perceived as problematic situations by more than a third of the respondents in each department, but not all departments were affected in the same way. Problematic organisational changes were more frequently mentioned in surgical departments (59.2%) and less frequently in non-hospital institutions (34.8%).

4.2.2. Workloads and work schedules (27.6%)

The second most frequently cited problematic situations related to COVID-19 involved workloads (from under-utilisation to overload) and work schedules. First, respondents (9.8%) highlighted overloads in the quantity of work to do or hours worked, as well as under-staffed units. Irregular or constantly changing work schedules were also deemed problematic (9.6%). Under-staffing was attributed to absences due to illness, work stoppages and reassignments to other units (7.4%). One caregiver explained how they faced "the burnout sick-leaves of several colleagues, leading to an overload in activity for the remaining people". Problems involving staff absences and transfers to other units were more frequently reported by senior managers (14.5%) than by employees without management roles (6.3%). For some respondents, however, problematic issues involved a lack of work, closed units and the cancellation or postponement of other healthcare activities (7.3%). One respondent explained how, "[With the] closure of our department, we had to move to other units. We were informed the day before and sometimes on the very morning that the new unit was assigned to us. Sometimes, we would only take care of COVID-positive patients for one day instead of several days. [It was] really absurd, dangerous and demotivating." Difficulties resting and recuperating were also reported: lack of breaks, vacations, rest, and uncompensated overtime (5.4%). One nurse experienced an "increase in working time without being able to record overtime or be compensated for it. Since the pandemic, I have worked several weeks at 100% instead of 70%." Another had to work "many weekends in a row and then a week of being on call for seven days when [they] returned to [their] original department." Finally, work–life balance and childcare issues were also mentioned (0.9%). One mother reported "logistical problems getting [her] children cared for, with more shifts than usual and [her] vacation week removed. [It] created a lot of anxiety".

Workload and work-schedule problems were reported more in the diagnostics departments (50%) and less in rehabilitation and geriatrics wards (22.6%). These issues were also more often reported by employees who did not work in COVID-19 wards (29.3%) than by those who did work in COVID-19 wards (20.5%).

4.2.3. Conflictual relationships (23.5%)

Tensions with hierarchies and their lack of support and gratitude were mentioned by 8.4% of respondents. One caregiver reported a "lack of support from the hierarchy, only busy with organisational tasks." Another recounted that their "hierarchy trivialised the COVID-19 crisis and made us feel guilty by telling us that we get sick outside and not in contact with COVID-positive patients". Team tensions were also reported (7.5%). One caregiver mentioned that the "team dynamic was disrupted by the fact that a part of the team was sent to adult intensive care. Those who remained were initially very worried about their colleagues, then overwhelmed by the workload they had to take on without their colleagues and unrecognised by the hierarchy, all concentrated on the frontline." Another added that there were "tensions in the team dynamics, [between those who worked] too many hours [and those who had] not enough hours. Caregivers became depressed, irritable and exhausted. [There were] conflicts about the distribution, or not, of days off." They added that "this generated a lot of frustration, leading to behaviours such as excessive alcohol or tobacco consumption and more." Tensions with patients and families were also reported (6.0%), especially about managing relatives' emotions, incomprehension and anger regarding restrictions on visits. Finally, managers reported difficulties in managing teams (5.2%), often related to employees' stress and complaints. Findings showed that senior managers (16.1%) and middle managers (10%) more frequently reported difficulties managing teams' complaints and stress than did employees without managerial roles (2.3%).

4.2.4. Patient-care practices and quality of care perceptions (17.2%)

The critical conditions of patients, deaths and ethical questions were the most frequent situations reported in this category (8.4%). One respondent wrote about the difficulties of managing the COVID-19 end-of-life of a 55-year-old patient without any relatives: "Seeing a person choke to death despite our care is difficult to bear. [I felt] helplessness and injustice, because outside the COVID-19 period this patient would have been transferred to the intensive care unit." Disagreements, inconsistencies and concerns about adequate patient management and the quality of care were also reported (6.7%). Concerns about the quality of care diminished with age, more often reported by healthcare workers under 40 years old (20.7%) than by 40–49-year-olds (18.4%) and those over 50 (12.3%). Isolation from families was also cited as an issue because of restrictions on visits (5.2%). Caregivers were sensitive to this problem and its consequences (*e.g.* depression), especially among new-born and their mothers and in end-of-life situations. Some were touched when premature new-borns were separated from their COVID-positive parents: "[It was] emotionally difficult to stick firmly to the decision because, on the one hand, we have to protect the other patients, and on the other, we take away the baby's fundamental right to see their parents".

Patient-care practices and quality of care concerns appeared more frequent among nurses, healthcare assistants and auxiliary nurses (23.6%) and doctors (18%) than among other professions. Doctors more frequently reported quality of care issues as severe (47.8%), situations which were described more often in departments for women, children and adolescents (29.7%) and in acute medicine (29.4%). Employees working in COVID-19 wards described quality of care issues more often (23.9%) than those working in non-COVID wards (16.2%).

4.2.5. Emotional burden, including fear, distress, and loneliness (16.8%)

Emotional burden was more often reported by nurses, healthcare assistants and auxiliary nurses (18.4%) and less often by doctors (7.8%). Major themes were fears of contamination by patients or colleagues (9.2%) and fears of contaminating others or relatives (3.8%). One caregiver recalled that "Some colleagues were so scared that they did not want to go home for fear of contaminating their loved ones." Feelings of unequal treatment related to workloads or days off were also cited (3.9%). One employee wrote that "a feeling of unequal treatment between employees was created, between those who worked from home all the time and those who were present at work." Finally, 8% reported on the stigmatisation of working in a COVID-19 ward or of feeling useless or guilty for having been on sick leave, being sent home because of a health vulnerability or working from home. One wrote of a "feeling of uselessness in our shut-down department, knowing that intensive care, emergency and other COVID-19 wards could have benefited from our resources."

4.2.6. Lack of information, communication and training (15.6%)

These situations were mostly judged to be moderately severe (41.9%). Respondents reported a lack of information and unclear or contradictory instructions (9.4%), as well as difficult intra- and inter-professional communication and cooperation, both with colleagues and doctors or health practitioners from other units (6.3%). One nurse cited the difficulties of remaining informed and of adapting to "the continuous orders and counter-orders, the protocols that changed continuously, sometimes during the same day", as well as the impossibility "of assimilating that amount of information" and the large number of "people who intervened because they had the impression that they had to do something. It was very tough; tougher than taking care of the patients". Finally, a lack of training and skills were cited (3.7%), *e.g.* by

the young graduate nurses and non-specialist nurses reinforcing specialist units. One specialist nurse explained her difficulties in "having to coach one nurse and supervise another new one [at the same time], while responsible for five patients." A lack of information, communication or training was more often reported in wards for acute medicine (23.5%) and medical specialities (23.2%). These issues were reported less in non-hospital institutions (7.1%). Employees working in COVID-19 wards (30.8%) noted this issue more often than those working in non-COVID wards (13%).

4.2.7. Difficulties with COVID-19 guidelines and protection measures (13.1%)

Respondents reported difficulties in observing rules and maintaining barrier measures (including using PPE) due to lack of understanding, time, desire and diverging interpretations (10.7%). Constant changes to guidelines and the required adaptations were seen as hindrances to doing an adequate job (4.6%). One caregiver questioned the "need to re-use material intended to be throw-away, as there was a shortage. [There were] almost daily changes in usage rules."

4.2.8. Accessibility of equipment for COVID-19 protection and patient care (11.3%)

Comments relating to this category dealt with a lack of COVID-19 PPE and with employees' exposure to a risk of contamination. Some respondents thought that the information that their hierarchy transmitted about this equipment was sometimes inaccurate or contradictory. One employee recalled an "enormous uncertainty with regard to the access to COVID-19 protection material." Another reported "conflicting messages and non-compliance with the rules by some departments. This led to shortages and psychosis about the means of protection." One caregiver wrote, "I saw a colleague crying because she was afraid of COVID-19 and [...] we did not have enough masks!"

Logistical, technical, maintenance and catering staff (16.3%), and nurses, healthcare assistants and auxiliary nurses (13.1%), more frequently reported a lack of access to COVID-19 protection material. Administrative staff reported this less frequently (7.7%). This issue was more frequently reported in rehabilitation and geriatrics departments (20.8%) and less in departments for women, children and adolescents (4.7%). Lack of protective equipment was the situation most often classified as severe (43.5%) by all the professions, but most frequently by logistical, technical, maintenance and catering staff.

4.2.9. Working from home: Technical issues or implementation difficulties (7.2%)

This problematic situation was more often reported by administrative staff (33%) than by other professional categories (from 1.6% to 7.7%). One administrative employee reported their problematic situation of the "reorganisation of work into working from home for almost all employees. This led to major stress, equipment difficulties, IT constraints, et cetera." Difficulties working from home were most frequently reported in the hospital management and general services department (25.7%). Senior managers reported this problematic situation (13.7%) more frequently than employees without managerial roles (6.9%) and middle managers (5.5%). However, 41.9% of respondents judged this type of situation to be "not very severe".

4.3. A classification of anticipatory and adaptive strategies

Totals of 29.1% (n = 376) and 26.3% (n = 340) of study participants responded to the open-ended questions on the anticipatory and adaptive strategies, respectively, used to deal with the specific problematic situations encountered and described. The answers to these two questions are presented together as they were very similar. Four main categories of strategies were identified, depending on whether they dealt with organisation, equipment, teams or individuals. The distribution of the different strategies across the four categories is depicted in Table 4.

Table 4
Frequency of anticipatory and adaptive measures (number and percentage of respondents).

Resilience strategies	Mentioned as anticipatory measures (N_{tot} = 376)	Mentioned as adaptive measures (N_{tot} = 340)
Organisational strategies		
Reorganisation of tasks, services and spaces; triage and prioritisation of activities	105 (27.9%)	92 (27.1%)
Implementation of protection measures	78 (20.7%)	40 (11.8%)
Assigning extra qualified personnel; strengthening of internal and external resources (using army or civil protection units); staff increases and reassignments	78 (20.7%)	58 (17.1%)
Increased activity rates, performance and shift lengths	56 (14.9%)	66 (19.4%)
New rules and protocols for patient care	50 (13.3%)	52 (15.3%)
Quarantine and patient isolation	46 (12.2%)	10 (2.9%)
Implementation of working from home	37 (9.8%)	23 (6.8%)
Support to employees: free meals, free parking, grocery delivery at home, accommodation and certificates for cross-border employees, hypnosis sessions, and outreach psychologists	7 (1.9%)	3 (0.9%)
Equipment strategies		
Increase in stocks of equipment and medicines, auxiliary means, and additional healthcare equipment	58 (15.4%)	12 (3.5%)
Team strategies		
Information, communication and training	66 (17.6%)	43 (12.6%)
Interdisciplinary collaboration and collaboration with families	64 (17.0%)	33 (9.7%)
Management support: management availability, listening and encouragement; support by clinical nurses and hygiene departments; designation of supervisors; adaptation of employees' schedules to their personal needs	28 (7.4%)	21 (6.2%)
Emotional and on-task peer support		51 (15.0%)
Support for patients		23 (6.8%)
Individual strategies		
Adapting one's care practices and behaviour, taking initiatives, being autonomous, finding a balance between constraints and values		23 (6.8%)
Managing one's fear of contamination, uncertainty and the unexpected		9 (2.6%)
Reorganisation of family life		5 (1.5%)

N_{tot} = total number of respondents.

Many organisational strategies were developed to meet the crisis. Reorganisations of tasks, services and workspaces were the most frequent. Regarding spatial reorganisation, one employee explained that "the department's mission has changed in reaction to the crisis. We had to set out 'clean' and 'dirty' zones with regards to COVID-19-positive patients, with each zone having its own team." Concerning task reorganisations, one caregiver noted that "before receiving COVID-19 cases, everything was reorganised: equipment inside and outside the room, smocks, masks, et cetera." Task priorities were reviewed. One caregiver remembered how "Some care activities, such as showering, were

stopped so that the team could focus more on cures." Many teams reorganised themselves: "We formed a team of nurses who cared for infected patients only, 24 hours a day, and a team of nurses who cared for other patients. We had to reorganise the entire nursing team's work schedule on the fly." Implementing protection measures against COVID-19 was also a major organisational strategy. All the organisational strategies were reported as anticipatory and adaptive measures.

Strategies linked to equipment were also implemented to meet the crisis, especially as anticipatory measures, *e.g.* increasing stocks of PPE (*e.g.* masks and disinfectant) and care equipment (*e.g.* respirators), drugs and auxiliary aids (*e.g.* wheelchairs). One pharmacist reported having anticipated the "drug needs and shortages that would occur […]. The three disaster plan simulations carried out at the pharmacy in the last two years enabled the rapid implementation of crisis management." One manager reported "searching for new suppliers, communicating about the state of stocks to avoid waste, discussing resource management and anticipating which activities would be abandoned first in order to guarantee gloves for activities that absolutely required them."

At the collective level, team strategies were developed. Managements initially deployed anticipatory measures (providing information, communicating, training and supporting staff) and encouraged interdisciplinary collaborations. For example, information was transmitted via regular emails, institutions' intranet, COVID-19 helplines for patient follow-up and meetings on the disease and the protective measures or protocols to be applied. Training was quickly set up, including courses, simulation workshops or e-learning on specific care practices or equipment. Observation days in other units and field follow-ups were organised. Management support was appreciated, whether relational or organisational. One employee recalled that "the morning meeting started by checking in with everyone, leaving time for questions and the expression of any fears. All topics, even private ones, could be discussed."

Interdisciplinary collaboration is the mutual aid that occurs within teams. In some cases, task distribution depended on employees' individual choices. Adaptive strategies, such as peer and patient support, were developed collectively by employees. Different departments collaborated in unusual ways. For example, palliative care staff were present in intensive care units. Similarly, different professionals (physicians, caregivers, psychologists, housekeepers, janitors and technicians) worked together, held multidisciplinary discussions and formed mixed teams. As one of them reported, "anaesthesiologists and intensive care worked hand in hand from March to May, along with other colleagues who came from the wards." Patient support and care decisions were made jointly with families, with whom new ways of communicating were developed to reduce patient isolation, including telephone calls or videoconferences. These means were also used for task and emotional peer-support. For example, some teams had "a WhatsApp group to share serious or fun information. This created a sense of belonging to the group."

Finally, individual strategies were only cited in response to the question on adaptive strategies, with reported adaptations made to practices and behaviours by taking initiatives and becoming autonomous. Finding a balance between situational constraints (such as fears and shortages) and values (good practices and quality of care) were also part of this category. One respondent summarised their psychological state as "Abnegation. Trying to disconnect from the violence of daily life. Trying to morally support the people we work with every day." Participants sometimes cited managing fears of contamination, uncertainty and the unexpected. Family-life reorganisations and accepting to put one's personal life on hold were only mentioned as strategies by a small minority.

5. Discussion

Healthcare workers around the world had to face difficult working situations during the COVID-19 pandemic's first wave. The present

findings are consistent with previous research (Baker et al., 2020; Dubey et al., 2020; Fang et al., 2020). The most frequently reported problematic situations involved organisational and activity adjustments, disrupted workloads and schedules, and conflictual working relationships. These issues led us to identify four categories of resilience strategies, depending on whether they dealt with organisation, equipment, teams or individuals.

5.1. Problematic situations encountered during the COVID-19 pandemic's first wave

Research about the pandemic's early phases concentrated on healthcare staff's risk of COVID-19 infection and the lack of appropriate PPE (Dubey et al., 2020; Fang et al., 2020). Many other publications explored the pandemic's psychological impact on healthcare workers (Amin, 2020; Fernandez et al., 2020; Greenberg et al., 2020). Another set of publications focused on hospital and employee overloads and patient care issues (Baker et al., 2020; Fang et al., 2020; Legido-Quigley et al., 2020).

Consistent with these findings, the present study also highlighted the lack of PPE and the difficulties of ever-changing COVID-19 instructions. Interestingly, this particular concern was not exclusive to caregivers in close contact with COVID-positive patients. Indeed, it was more frequently expressed by logistical, technical, maintenance and catering staff, who also perceived this issue to be more severe than did other professions. This could be related to differences in health literacy, lack of familiarity with the risk or the actual unavailability of PPE for support staff. At the end of our study, this remains uncertain. These employees nevertheless played important roles in institutions' adaptive processes, and many of them were also on the frontline. Weick and Sutcliffe (2001) contended that deference to expertise is an important characteristic of highly reliable organisations. According to this principle, frontline staff's practical experiences contribute to organisational resilience. Therefore, it is crucial to promote upward communication, including by lower-skilled employees such as maintenance staff.

This study also showed that frontline healthcare workers, especially caregivers and doctors, were concerned by patient care practices, the quality of care and patients' and families' suffering. This issue was more often reported in COVID-19 wards, where frontline workers had to make decisions and adapt their care practices in climates of uncertainty. The unpredictability of a COVID-19 diagnosis could lead to disagreements, incoherence, worries and conflicts over the care patients should receive. As Azoulay et al. (2020) suggested, intensive care unit specialists experienced great moral distress related to sub-optimal decision making, difficulties in involving patients' relatives and the perception that care was inappropriate. Their experiences of patients' pain, death and isolation from their families represented another problematic situation for the healthcare workers in this study, especially in departments for women, children and adolescents and in acute medicine. In the same vein, Galehdar et al. (2020) showed that frontline nurses became greatly distressed and felt helplessness at witnessing suffering and dying COVID-19 patients, and having to deliver families bad news. In the present study, concerns about the quality of care appeared to diminish with respondents' age. One hypothesis is that young caregivers still idealise care, seeing it as they learned about it during their studies, whereas older caregivers have already lowered their expectations in line with reality. It could also be an increase in adaptability to uncertainty, which comes with age and experience. Future studies could explore this subject.

One interesting and original finding from our study was employees' frequent organisational concerns. Problematic situations related to the reorganisation of departments, work activities and work schedules were far more frequently reported than were issues about the quality of care and COVID-19 PPE. The university hospital whose staff made up most of the sample had to reorganise its whole operational structure in order to deal with the COVID-19 pandemic's consequences. On the one hand,

senior managers were highly solicited as they had to implement and lead these changes. On the other hand, the whole hospital staff had to quickly adapt to new activities, services, teams, schedules and workloads. Such major changes led to increasingly conflictual relationships, information and communication problems, and the need to develop new skills, especially in the hospital departments that underwent major changes, such as acute medicine, speciality medicine departments and COVID-19 wards.

5.2. Resilience strategies for organisation, equipment, teams and individuals

Institutions, teams and employees implement resilience strategies to anticipate, monitor, adapt to and learn from problematic situations (Anderson et al., 2020; Hollnagel, 2018). Organisational resilience depends on a system's wide array of structural, relational and individual dimensions. According to Barasa et al. (2018), important factors of resilience are resources in equipment, preparedness and planning, information management, governance processes, leadership practices, organisational culture, human capital, social networks and collaboration. All hierarchical levels should be involved in and committed to enhancing resilience (Weick and Sutcliffe, 2001). Previous publications have shown the value of personal and team initiatives to face adversity, regulate work activity and adapt procedures to the reality in the field (Back et al., 2017; Caroly and Barcellini, 2015; Couix, 2010; Dekker, 2006).

The most cited resilience strategies in the present study were organisational. The anticipatory strategies reported by respondents seemed to originate mostly from institutions and management. In terms of adaptations after the beginning of the pandemic, collective, bottom-up resilience strategies were added to organisational, top-down strategies: increases in employee versatility, prioritising tasks, interprofessional collaboration, cooperation with networks, supporting peers emotionally and with their tasks, supporting patients and families, creating new ways of communication with families to reduce patient isolation, and so on. At the individual level, employees developed strategies to manage their emotions (fear of contamination, uncertainty), find coherence between their values and the reality of care (Galehdar et al., 2020) and balance their professional and personal lives. However, our data showed that organisational strategies were far more common than individual and team strategies, probably for methodological reasons. Indeed, our study's open-ended questions followed on from a detailed set of closed-ended questions on the measures implemented by individuals and teams. This will be addressed in a future manuscript.

Most of the resilience strategies reported in this survey were cited as anticipatory and adaptive strategies. The exceptions were a few collective (peer and patient support) and individual measures (behavioural adaptations, personal initiatives, managing fear and reorganising family-life) that were only reported as adaptive strategies. This is surprising since theoretical models describe anticipation and adaptation as discrete resilience processes (Anderson et al., 2020; Hollnagel, 2018). We hypothesise that few measures were taken in anticipation of the COVID-19 pandemic's problematic situations, mainly because of its sudden onset, which could explain this discrepancy. Decisions had to be taken very quickly, making it difficult to distinguish between anticipation and adaptation, particularly for the frontline employees working far removed from the decision-makers.

The measures reported by the study participants only partly reflected the types of problematic situations they identified. The most frequently noted problematic situations concerned the reorganisation of working activities and workloads; unsurprisingly, organisational measures (reorganising working activities, reassigning staff, increasing staff numbers, etc.) were the most frequently reported adaptions. Concerns about the quality of care, which were relatively widespread, were often mentioned in terms of the support provided to families and patients. On the other hand, other types of frequently noted problematic situations

were not found in proportion to their anticipation and adaptation strategies. This was the case for conflictual relationships, which were noted by a quarter of all the respondents who cited a problematic situation. However, it was only addressed by a few reported strategies (*e.g.* peer support, management support). Additional statistical analyses (not shown here) revealed that this category of problematic situations was significantly more often managed by teams (as anticipatory strategies) and individuals (as adaptation strategies) than by institutions. Furthermore, the emotional burdens expressed in several problematic situations only seemed to be managed by some collective and individual measures (peer support, management support and individual management of fear). Finally, the lack of PPE and care equipment was the second least frequently reported category of problematic situations. However, the implementation of protective measures and the acquisition of required equipment were frequently mentioned adaptive measures. This could be explained by the higher perceived severity of this category of problematic situations.

5.3. Strengths and weaknesses

This study contributed to the recent stream of research on resilient healthcare (Hollnagel et al., 2019) and is one of the first in Switzerland (Ellis et al., 2019). According to Berg et al. (2018), most studies of resilient healthcare have only explored the micro-level, i.e. by questioning employees. The present study combined employees' answers (micro-level) with the institutional measures reported by managers (*meso*-level). Like most studies referenced by Berg et al. (2018), the present study did not explore the macro-level of national healthcare systems. Integrating the three levels into a single research protocol seems difficult because each level involves specific disciplines and methods. In the bibliometric analysis of resilient healthcare conducted by Ellis et al. (2019), most studies used a qualitative approach. Our mixed-methods research design enabled us to quantify a large set of qualitative data and conduct statistical analyses with quantitative demographic and work-related variables. The classification of level-1 and level-2 situations could be re-used and complemented in future studies targeting or analysing new situations.

The present study suffers from some limitations, however. Since most participants came from one large hospital, its findings could not be generalised to all healthcare organisations without further investigations. Moreover, few statistically significant relationships were found between the problematic situations reported and demographic or work-related variables. This was probably due to variables containing many different options, thus creating small subsamples. Lastly, data collection using questionnaires implies a lack of depth to responses, in comparison with interviews.

5.4. Future avenues of research

The difficulties of revealing individual and collective anticipatory and adaptive strategies is an interesting research perspective that deserves consideration. Future studies could investigate this issue in more detail, using focus groups, field observations or interviews. Longitudinal studies could capture the evolution of problematic situations over time and the responses to them provided by institutions and teams. Finally, it would be interesting to explore the relationships between problematic situations and quantitative measures of organisational resilience. A parallel sub-study is currently ongoing and will be the subject of a future publication.

6. Conclusion

This empirical study showed how the employees and managers of Swiss healthcare institutions responded to the problems associated with the COVID-19 pandemic's first wave. The macro-level measures implemented by governments and healthcare authorities are essential, but not

sufficient, to ensuring healthcare system resilience. Indeed, *meso*-level adaptations made by institutions and micro-level strategies put in place by teams and employees are also crucial. Based on the present findings, we suggest two possible means of reinforcing *meso*-level resilience. First, a more systematic approach to safety and risk prevention processes among support staff would improve their risk awareness, enhance their access to PPE, reinforce their coping strategies and show that they have a valuable role to play in a healthcare institution's adaptive responses. Second, the pandemic places significant demands on senior and middle-managers, as well as on teams and employees, in terms of communication skills, cooperation, decision making, conflict resolution and emotional burdens. Institutions could support their managers by providing the resources to help them improve their communication skills, transparency, empathy and team management. Reinforcing managerial and communication skills would contribute to negating employees' feelings of misinformation, uncertainty, inequity, or exhaustion. Support processes could also be developed for employees in the areas of teamwork, decision-making, cooperation, conflict resolution and providing emotional support. More generally, this would also increase the resilience of healthcare workers as individuals in anticipation of the multiple challenges ahead.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ssci.2021.105277.

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