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**Managing nursing shortages in the hospital:
a distributed view of personnel management**Nicolas Canales-Bravo^{1,2} *, Pierre Falzon¹, Adelaide Nascimento¹¹Center for Research on Work and Development (CRTD) – Conservatoire National des Arts et Métiers, France.²Institute for Radioprotection and Nuclear Safety (IRSN), France.

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Abstract

This paper explores how nursing teams of a hospital department manage constraints and resources to ensure quality of care in the context of staff shortages. Specifically, the study seeks to understand how these teams address decisions (imposed by the organization to compensate for staff shortages) and their subsequent impact on daily operations. To this end, an on-site study was conducted in seven neurology inpatient units at a Parisian hospital affected by a significant shortage of nursing staff. This qualitative study employed three different data collection techniques - analysis of organizational documents, systematic observations, and simulated case interviews, adopting an activity-centered ergonomics approach. The results reveal that nurses do not merely implement managerial decisions regarding personnel management. Instead, they contribute to formulating these organizational solutions (such as substitution, working time regulation, and mobility) and facilitate their execution through various regulatory actions and reorganization of resources (workload redistribution, competency balancing, task rescheduling). These findings propose a distributed perspective of workforce management, where it is not solely seen as a top-down process, or the mechanical fallout of managerial decisions to allocate resources. Rather, it is understood as the evolution and enactment of choices made at all levels of the organization, with the aim to optimize work quality, secure operational safety, and protect existing resources.

Keywords

Workforce management, staff shortage, staff scheduling, activity-centered ergonomics, risk management

1. Context

Workforce management is a pivotal element in maintaining hospital safety. The efficiency of any healthcare organization is fundamentally contingent upon the constant availability of an adequate number of skilled employees, strategically deployed in a work environment that enhances their productivity. Multiple studies and systematic reviews demonstrate that the presence of sufficient, proficient staff correlates with more favorable patient outcomes, including lower mortality rates (Aiken et al., 2014; Needleman et al., 2002), fewer complications (McHugh et al., 2011), improved patient satisfaction (Aiken et al., 2012), shorter hospital stays, and fewer readmissions (Lasater & McHugh, 2016). This also ensures optimal practice conditions for caregivers (Butler et al., 2011), promoting occupational health and safety at work (Kornig, Chadi & Levet, 2016).

However, for the past two decades, France and many other industrialized nations have been grappling with a shortage of caregivers, including nurses and care assistants (WHO, 2016; 2020a). This deficit is attributed to escalating demands for care services, a dearth of job openings, budgetary constraints, insufficient investment in training and education, an unstable labor market, and subpar working conditions (Kornig et al., 2016). This human resource shortage has been exacerbated by the recent health crisis triggered by COVID-19 (WHO, 2020b). In this context, the discourse surrounding the most appropriate workforce management strategies and models for hospitals has been revitalized (Frimousse

& Peretti, 2021). This discussion encompasses not only strategies to optimize workforce staffing but also methods to enhance its day-to-day management, including scheduling and reassignment.

2. Objectives

A field study was undertaken in the inpatient units of the Neurology Department of a prominent Parisian hospital, which is consistently grappling with a shortage of nursing staff, including both nurses and nursing assistants.

The aim of this study was to comprehend how nursing teams interpret and adapt to healthcare managers' decisions to mitigate the personnel shortages affecting the service. The research primarily focuses on analyzing the organizational solutions that managers adopt to structure nursing teams according to the actual availability of human resources. Furthermore, it examines how, in this context, these teams ensure the effective execution of these solutions.

3. Methods

An ethnographic qualitative study was conducted across seven inpatient units within the Department. Each unit accommodated patients with specific typologies, subject to varying hospitalization modalities (traditional hospitalization, weekday hospitalization, and mixed hospitalization). Twenty-eight nurses and assistants, hailing from five teams operating within these units, participated in the study. These teams worked in alternating morning and afternoon shifts, with two teams alternating between two different inpatient units.

Data collection proceeded in three stages, utilizing analysis methods derived from activity-centered approaches in ergonomics (Falzon, 2015; Daniellou & Rabardel, 2005). During the first stage, exploratory interviews with key informants were conducted, and organizational documents were scrutinized to gain insight into the operations of the various inpatient units. In the second stage, four full working days of systematic observation were devoted to two nurses and two nursing assistants from each unit (totaling 28 observation sessions, recorded manually). The objective of this stage was to identify the range of organizational solutions adopted by health managers to counteract staff shortages and their impact on the practical work of the nursing teams. Ultimately, 20 caregivers (comprising 2 nurses and 2 care assistants from each inpatient unit) were interviewed using a simulated case interview protocol (Sfez et al., 2008). This aimed to understand their perspectives on the solutions implemented by the nursing leaders and the potential actions in response to these changes.

4. Main results

4.1. Organizational Responses to Nursing Staff Shortages and Their Impact on Care Teams' Work

The scarcity of healthcare personnel creates daily disturbances that require continuous, multi-dimensional management. Nursing managers, responsible for addressing these disturbances, propose organizational solutions and apply human resources adjustments, whether internal to the neurology department, transversal to the hospital, or external. These measures, which can range from shift changes to the incorporation of external staff, are decided upon following an organizational protocol in collaboration with various relevant actors.

Throughout 28 days of systematic observation, it was noted that out of the 116 positions that were required to be filled - approximately 2 nurse positions and 2 assistant positions per shift in each unit - 28% (33 positions) were disturbed due to staff shortages. On 21 of these observation days, organizational solutions were implemented in response to these disturbances, meaning operations had to be carried out

with staffing configurations different from those planned. The solutions that head nurses most frequently employed were:

- Compensation with internal staff working overtime (5 cases, corresponding to 15.2% of the disturbances).
- Substitution via internal relief or pool staff (7 cases, 21.2%).
- Substitution via external relief or interim staff (1 case, 3%).
- Staggered schedules: This is a specific modality of work time modulation where a caregiver works both in the morning and afternoon, covering staff shortage during the day (5 cases, 15.2%).
- Staff mobility between different units of the department (4 cases, 12.1%).

However, not all disturbances were compensated: in 10 of the 33 disturbances (corresponding to 33%), the positions remained vacant or uncompensated. The most common causes of these disturbances were the structural lack of personnel (48.5%), absences due to illness (36.4%), recovery of working time (6.1%), vacation (3%), and training (3%).

The analysis of these organizational solutions revealed three notable aspects to highlight. Firstly, these solutions were implemented heterogeneously across different hospitalization units. For example, internal and external relief and inter-unit mobility were more common in traditional hospitalization units, where patients tend to have more severe pathologies. In contrast, in weekday hospitalization units, it was more common to resort to staggered schedules, and these also concentrated a larger number of unfilled positions. Secondly, during 10 of the 28 observation days (35%), teams had to work with fewer personnel than the hospital had initially planned. Lastly, all of the 10 uncompensated absences corresponded to nursing assistant positions, indicating a variability at the job level.

4.2. The Role of Care Teams in Designing Organizational Solutions to Compensate for Staff Shortages

While it might be assumed that the responsibility for staff management falls on health managers, the reality is more nuanced. A variety of actors within the organization participate at different levels in the conception, decision, and implementation of solutions. Among them, nursing teams play a crucial role.

From their central position in the provision of health services, they provide information and propose adjustments according to the challenges and difficulties faced by each unit due to staff shortages. This commitment is an example of vertical activity regulation, and occurs in both formal contexts (team meetings, medical transmission, emails) and informal contexts (corridor conversations, coffee breaks).

The contribution of these teams to the design of organizational solutions can manifest in three ways:

- Providing information to those in charge about the fluctuations in constraints or resources that can affect the operation of each unit, detecting changes or weak signals. For example, a nursing assistant warns the head nurse in advance about the absence of a colleague or a significant variation in workload.
- Directly participating in the design of an organizational solution, that is, suggesting to the health cadres the most appropriate organizational responses for the workload and organization of each hospitalization unit. For example, a nurse points out that covering an absence with external replacement personnel is not the best solution, given that there are a significant number of specific technical tasks (such as the administration of chemotherapy with Methotrexate) that require an experienced colleague.
- Finally, participating in the search for available human resources to implement different solutions. For example, an assistant contacts colleagues from another unit to ask if anyone is interested in making a replacement.

It should be noted that the participation of nursing teams in the construction of these organizational solutions lies in their intimate and specific knowledge of the reality of their work. Their direct experience with patient typology, unit operation, and work organization gives them a unique and invaluable view. This firsthand perspective, based on their competencies and skills, is essential to understand and efficiently manage the disturbances that arise due to staff shortages.

3.3. *Frontline Nursing Staff: Adaptation and Regulation of Solutions to Offset Staff Imbalances*

The results of this study show that frontline nursing staff not only contribute to the co-creation of solutions, but also implement actions of adaptation and adjustment to management decisions during their work. These actions, such as workload regulation, care redistribution, and collective work reorganization, aim to offset staff imbalances, both in terms of quantity and quality, which could affect team performance.

It is important to highlight that caregivers propose to implement these regulations only when the work situation allows it to be safe for both them and the patients. The aim of these regulations is to maximize the utility of available human resources, achieving the best performance in terms of quality and safety, while ensuring the health and safety of the caregivers. To achieve this, the development of arbitration competencies and technical skills that allow a safe and efficient use of resources within functional limits is required.

Regulations can vary in each unit, depending on the type of patient and the organization of work, but they share the goal of reconciling criteria of speed and efficiency, balancing performance and safety, and preserving health. During the interviews, five categories of regulation actions implemented by caregivers were identified, with an average of 5.8 actions proposed by each participant during case resolution during the interview (out of a total of 116 responses delivered).

a) Individual regulation to organize medical and nursing care tasks

This form of regulation refers to sophisticated strategies or operating modes developed by each worker in light of their experience in their job role that allow for the efficient regulation of individual workload.

For example, to administer care to a large number of Parkinson's disease patients at the same time, a nurse will prioritize the distribution of Parkinsonian treatment due to the risk of these patients becoming blocked. Afterwards, the nurses can focus on other care tasks and have additional time to spend with patients at the end of their shift. In a weekly hospitalization unit, experienced nurses have demonstrated the ability to handle a greater number of immunoglobulin treatment prescriptions thanks to their skill in regulating the administration of this medication. For instance, the nurses are able to expedite a patient's medical discharge by safely accelerating the administration of the treatment, or in other cases, they can slow down the administration of this medication in order to have time to perform other tasks, such as conducting another visit or carrying out protocol traceability, among other tasks.

b) Collective regulation to manage the care workload.

These forms of regulation differ from the previous ones because they involve the participation of two or more caregivers in the action. Through them, the caregivers present in the work situation seek to combine their available individual and collective resources in the most efficient way.

A common strategy of this type consists of redistributing patients and care to balance the workload or ensure that each worker's competencies become functional again. For example, in one studied unit, nurses and assistants equally divide the patients in the room (seven patients each). However, when

external caregivers cannot perform certain care tasks or are unfamiliar with a patient's pathology, regular caregivers suggest exchanging patients or prescriptions that they cannot handle for others that they know or can perform, so that each one has a similar workload. A second example of this type of strategy involves preparing the work environment for replacement staff. Faced with potential delays in their arrival, regular caregivers take charge of preparing the material, prescriptions, and administrative documents in advance, ensuring that the care and prescriptions are carried out on time by the replacement staff.

c) Temporal regulation of tasks

Another regulation mechanism used consists of temporarily reorganizing tasks. For example, nurses or assistants can reschedule non-urgent care to the end of the day or transfer them to the next shift (for example, shaving a patient or changing a port-a-cath (PAC)). This happens when they face an additional workload due to a lack of staff or when they need to provide assistance to the assistants. In the second case, nurses only delegate care if the workload of the next shift team is manageable and if the caregivers of that team accept it.

d) Intra-unit Cooperation and Collaboration

To balance the lack of human resources, both in quantity and quality, collective work is used through functional collaboration or cooperation between peers of the same or different profession who work in the same unit. This form of regulation allows caregivers to provide physical or cognitive assistance to carry out tasks more efficiently and with less effort. For example, in some units, when external assistants are not familiar with the service or the type of pathology, regular assistants can propose working in pairs to explain the organization of the service and how to carry out specific care. This type of action allows for training external personnel in situ, but also to supervise their actions from a safety point of view. Similarly, when assistants are missing in these units, the present assistants usually ask the nurses to assume the role of assistants to help them perform care that requires the collaboration of two people, such as bed hygiene or moving a patient to a sofa.

e) Inter-unit Cooperation and Collaboration

The regulation method described above can be implemented by asking for support from caregivers in nearby units to alleviate the disturbances that may occur after the adoption of an organizational solution. If assistance is needed for a specific task, whether due to its technical complexity or an increase in workload that is difficult to manage (risk, urgency), the regular caregivers of a unit can turn to their experienced colleagues from other units. In these cases, a caregiver from a different unit comes to provide support only for the time necessary to complete the task at hand. Generally, the regular caregivers know the colleagues from other units who can provide them help for each type of care. This support system tends to be reciprocal among the different units.

5. Discussion/Perspectives

The shortage of staff in the healthcare sector, especially in the nursing area, poses significant challenges that affect the quality of healthcare services and the health and safety of healthcare workers. However, this study shows that health managers and nursing teams are not standing idly by in the face of this situation, but rather employ a series of decisions and actions to design and implement organizational solutions that allow them to confront these problems and improve care as much as possible within a fragile work system.

In this context, nursing teams have a dual role in building solutions to manage the lack of staff. First, caregivers assist health managers in designing organizational solutions adapted to the needs of the field,

whether by reporting important information, seeking resources, or even proposing specific solutions. On the other hand, caregivers carry out daily individual and collective regulations and adaptations aimed at ensuring the efficient implementation of the organizational solutions decided by the managers. This regulatory capacity, based on their intimate knowledge of the reality of work and their direct experience with patients, allows them to maximize the efficiency and quality of care, despite personnel limitations.

Thus, the results allow us to reflect on the type of practices and conditions necessary to ensure sustainable workforce management in the short and long term. The research leads to the proposal of a distributed vision of workforce management. Workforce management is to be understood not only in a top-down way, that is as the mechanical consequence of directive decisions of resource allocation, but as the implementation of options taken at all levels of the organization, with the aim of optimizing the quality of work, securing it, and protecting existing resources. In the case presented, it is demonstrated how close collaboration between health managers and nursing teams is essential to effectively address the shortage of staff and continually improve the quality of healthcare services.

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