Original Article

Adhesion to use individual protection equipment during the Covid-19 pandemic: a phenomenological study with nurse managers

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ABSTRACT

Objective: To understand, according to the perception of Nurse Managers of a hospital, the adhesion to the use of personal protective equipment (PPE) by health professionals during the Covid-19 pandemic.

Methods: Qualitative phenomenological study, involving 17 Nurse Managers of a hospital in the North of Portugal, during the first wave of the pandemic. A semi-structured interview and content analysis were used to process the data.

Results: Facilitators of adherence to the use of PPE; hinderers of adherence to the use of PPE and strategies that promote adherence were the resulting categories.

Conclusion: Fear and the perception of risk were the facilitators that most impacted on changing behaviors, while compromised use of PPE was the biggest hinderer. Supervision of the team and care delivered stands out as a central strategy of Nurse Managers. The Nurse Manager must implement strategies that promote behavioral changes and enhance adherence.

Keywords: Hospitals, Nursing, Personal Protective Equipment, Work Environment.

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Introduction

The Covid-19 pandemic represents one of the greatest crises in recent human history. Organizations face major challenges in combating and managing it, focusing attention on workplaces, identifying populations at risk, understanding the mechanisms of propagation and implementing control and prevention measures, ensuring safety and health at work (1).

The higher risks of transmission in health professionals, imply specific control measures, in order to reduce the risk of exposure and transmission and include, among others, the selection of Personal Protective Equipment (PPE), assuming that only the appropriate use can guarantee the protection of the health care professionals (1,2).

Although the use of PPE is recognized by health professionals as one of the most effective preventive measures in individual protection, reality is that its recommendations have not been fully incorporated into clinical practice (3).

The low adherence to the use of PPE is based on multifactorial aspects, related to the experienced environmental context, but also on individual values and beliefs, related to the perception of professionals about the risks to which they are exposed and their susceptibility to these same risks (4).

From the environmental factors it stands out the staffing and the consequent overload of work, training and technical competence, inadequacy or absence of equipment/structures, organizational culture and environment, the involvement of management and the leader's profile (3).

Fear can also have a positive effect on the use of recommended guidelines, as it emphasizes the danger and potential harm, highlighting the perception of the disease severity and the benefits of PPE use (5).

It is undeniable that the correct use of PPE has never been more notorious for the prevention of biological risk as in Covid-19, so behavioral changes in health professionals and greater attention from institutions are expected, assuming this issue as a central element of their safety (6).

It is worth highlighting the role of the Nurse Manager in the prevention of biological risk through the control and supervision of the correct PPE use, as an essential condition preventing the transmission of Covid-19 (6,7).

Therefore, this article aims to understand, according to the perception of Nurse Managers of a hospital, the adhesion to the use of PPE by health professionals during the COVID-19 pandemic.

Methods

This is a qualitative study with a phenomenological approach.

Participants

The study was carried out in a hospital in Northem of Portugal, between March and April of 2021. The study population consisted of all the nurse managers working during the first wave of COVID-19, in a total of 21. For reasons of absence, unavailability and illness situations, the research included 17 participants.

Data collection and analysis

A semi-structured interview was used to collect information, with an average duration of 30 minutes, based on a script consisting of open guiding questions, which aimed to meet the proposed objectives (Table 1). The interviews were face-to-face, scheduled and carried out by the researcher according to the availability of the participants. It was decided to record them, after obtaining consent from the participants.

The interviews were fully transcribed. In order to obtain data meanings, it was done content analysis (8).

The data was organized and systematized through exhaustive reading and later coded, proceeding to group the information according to the thematic, from which emerged the categories, subcategories and units of record. In the last phase of the analysis, the results were treated, inferred and interpreted.

Ethical considerations

The study was approved by the Ethics Committee for Health at the institution's Board of Directors (10/CES/JAS) and informed consent was obtained from the participants. Anonymity was ensured through coding with the attribution of the letter E (Interviewee), ordering them numerically from 1 to 17, according to the order of the interviews.

Table 1. Interview guide

THEME	GUIDING QUESTIONS
Work conditions	Do the physical characteristics of the department allow to provide safe care in a safe environment? Do the material resources available cover the needs? Are staffing numbers in line with the amount of hours needed to provide care?
Promoting safe work environments	Is biological risk a problematic topic concerning health professionals' safety? Regarding biological risk prevention, what is the importance that you give to the correct use of PPE? Is PPE available in the right quantity and does PPE have appropriate quality? Is biological risk prevention part of the department training plans? Are there in the institution procedures or structures that enhance the use of PPE by professionals? In terms of organizational policy what kind of support is provided to Nurse Managers to promote adherence to the correct use of PPE?
Adherence to the use of PPE during the Covid-19	Do you consider that adherence to the correct use of PPE is a problem for the professionals' safety? Do you think that adherence to the correct use of PPE can have an impact on preventing the biological risk associated with Covid-19? Do you perceive difficulties in adherence to the PPE use by professionals? If yes, can you specify which ones? Do you identify adherence failures to the use of PPE? To which PPE specifically and why? Did you identify changes in the adherence to the use of PPE by professionals during the Covid-19, compared to the phase before the pandemic? If yes, can you specify why?
Determinants in the use of PPE	During the Covid-19, what factors may have boosted adherence to the use of PPE? During the Covid-19, what factors may have made it more difficult to adhere to the use of PPE? Do you consider the involvement of top management an important factor in the adherence to the use of PPE? What is the role of middle management in the adherence to the use of PPE?
Strategies to enhance adherence to the use of PPE	Does your department use some type of strategy to enhance adherence to PPE? Do you use any instrument to assess the effectiveness of your strategy? If yes, how often?

Results

Study participants were mostly female, with an average age of 54.3 years, average professional experience of 32 years of service and average of 26.2 years working for the institution. Participants work mainly in inpatient departments. It was found that participants had differentiated academic instruction, with a predominance of postgraduate training in Administration and Management in health services, in addition to Infection control and Health and Safety at work. Most participants had the professional category of Manager Nurse followed by Specialist Nurse. Participants have been in practice as a Nurse Manager for an average of 14.8 years.

From the categorical analysis carried out, 3 categories and 24 subcategories emerged, shown in table 2, as well as the frequency that the recording units emerged in the speeches.

Table 2. Categorical analysis

Categories	Subcategories	Frequency of occurrence
Facilitators of adherence to the use of PPE	Emotional state conditioners	64/17
	Impact of the pandemic on adherence to the PPE use	40/17
	of teams for PPE use	27/17
	PPE availability	17/17
	Teamwork	15/17
	Attributes of organizational culture	10/17
	Personnel management	9/17
	Favorable structural and physical conditions	9/17
Hinderers of adherence to the use of PPE	Compromised use in the adherence to PPE	52/17
	Information management	30/17
	Weaknesses in the organizational culture	26/17
	Problems in structural and physical conditions	17/17
	Problems in Personnel management	13/17
	Discomfort in the use of PPE	8/17
	Difficulties in managing PPE	7/17
	Constraints in the training processes	7/17
	Non compliance with adherence during breaks	7/17
Strategies that promote adherence to the PPE	Supervising the team and the care provided	28/17
	Identifying reference professionals	14/17
	Promoting training processes	13/17
	Promoting comunication strategies	12/17
	Managing material resources	12/17
	Enhancing processes of continuous improvement	8/17
	Recognizing work performance	4/17

Facilitators of adherence to the use of PPE

All participants were unanimous in stating that they perceived a more adherence to the PPE use

…changed a lot …Before…No, this was never done E1… with the pandemic, people adhered to PPE much more… E11.

It was evidenced that the **Emotional state conditioners** were the ones that had the greatest impact on this behavioral change, having emerged 64 times in the speeches. Related to this subcategory, fear was the most mentioned emotion

…I think there is now a click for us, fear changed everything…E2.

Changes in risk perception also enhanced adherence to the use of PPE

… for the first time, we thought we could get sick … the perception of the risk they could have E3.

Training of teams for PPE use has always been an important topic within the Institution's training plans, being a tool to promote the acquisition of skills

… massive training … led people to raise awareness, to change behaviors… E11.

Likewise, the **PPE availability,** considered an essential condition for the protection of professionals, was assured by the institution, in addition to the attention given to the selection of distribution sites

…. There is a requirement in the Institution for good management, but there is also no lack of resources… E12.

Changes in interpersonal relationships were noticed during this phase. **Teamwork** had a positive impact on the group in terms of adopting protective behaviors

… everyone was aligned with the same purpose, … always a spirit of mutual help, … E15.

Personnel Management, related to the staffing of professionals, was taken care of by the institution, not jeopardizing the development of safe practices,

…sufficient ratios,… with expertise… with some time of experience, and therefore… safety in care… E12

Related to the **Attributes of organizational culture**, the existence of policies aimed at risk prevention was perceived, encouraging the adoption of adherence behaviors,

… the institution … have and emanate normative and informative documents, … they help the manager and, in this case, in the guidelines to be given to the teams E16.

Regarding the **Structural and Physical Conditions**, it was perceived by the nurse managers that they did not constitute an increased risk.

Yes… negative pressure… it helped a lot to maintain security and the fact that we have private rooms as well. E17.

Hinderers of adherence to the use of PPE

Of the nine subcategories obtained, **compromised use in adherence to PPE** was felt as a problem in the safety of professionals, emerging as the most referenced subcategory. The failures detected were related to the excessive use of PPE and the correct placing and removal of equipment

… there are failures in dressing and undressing…. There is a lot of error in the technique…. More in taking off than putting on… E12.

Information management, related to excessive production, often contradictory, compromised the effectiveness of messages, creating instability in the teams, with a direct impact on compliance with guidelines related to adherence to the use of PPE.

The constant change in procedures… today this PPE is used, tomorrow it is no longer necessary, … the transmission to the information management team…, we were not able to create strong and safe procedures to work with E17.

Weaknesses in the organizational culture related to the lack of follow-up, monitoring and availability were perceived by the nurse managers

….I felt completely alone because I didn't have support… the organization should support us in terms of helping guarantee the safety of workers E11.

In the subcategory **Structural and physical conditions problems**, participants saw existing conditions worsened, related to the organization and adequacy of spaces, lack of material or equipment and problems related to the renewal of the air

…. Patients are very close to each other, … the nurses is caring for the patients, clean the curtains with their backs, it is a risk for professionals E16.

Problems in personnel management further exposed the weaknesses felt, as there was no capacity to ensure the planned staffing that would answer to increased needs

> *… we always had to have someone else from the outside, a mirror. We had to improvise… E13.*

Discomfort when using PPE was perceived as a barrier and caused resistance in the adherence to the PPE's

> *… the difficulty of using for many hours … that is not comfortable …, people leave completely soaked, even the glasses are all foggy, they can't see what they have in front of them… E17*

Regarding the subcategory **Difficulties in managing PPE**, there were several constraints associated with the reorganization of the Institution, in order to respond to the increased needs,

> *… I had many difficulties in the PPE… There was a very large deficit… the professionals did not have masks, we didn't have the necessary protection to give care E11.*

Constraints in the training processes were based on the absence of standardized training plans that were disseminated among all professionals, absence of institutional training and respective supervision

> *… We do not include the medical part and we have major constraints, because we are not all at the same pace E8.*

Associated with the social moments, it was perceived **Non-compliance with adherence during breaks**,

> *... the social part among professionals, that's when people were more careless... people started to make it easier there, when they weren't wearing a mask E6.*

Strategies that promote adherence to the PPE

Supervising the team and the care provided is the most frequently mentioned subcategory. It was highlighted the importance of monitoring and guiding professionals while providing care as a fundamental strategy to ensure the correct use of PPE,

> *…. You have to walk in the middle…. Being the reference… if you give greater or lesser importance to a certain aspect, of course this will be noticed more in that team,… E9.*

It was mentioned the importance of **Identifying reference professionals** within the teams as a vehicle for promoting adherence

… it is necessary to know the team well,… know how to use key people to achieve changes… the vehicles… if not for a model, at least not to be resistant… E2.

In the subcategory **Promoting of training processes**, the importance that Nurse Managers assign to the training processes is reflected, for the training of professionals and their role in promoting evidence-based practices,

... he is (Nurse Manager), responsible for training... sharing this training with employees and carry out skills training to use PPE E11.

Promoting communication strategies by using new technologies was favorable to interpersonal relationships and communication between different professionals, responding to the demands for clear and continuous information

… we started using WhatsApp,…. Pictures were taken,… information all the time, it was placed everywhere, so the information was too much to disseminate very quickly and to implement yesterday,… E12.

The management of material resources was a concern of the nurse managers, simultaneously guaranteeing the protection and safety of the professionals and also the sustainability in access to equipment

... I often showed the price… of those masks… to raise awareness a little… to use the equipment well… protecting as much as we can, but in a rational way… E10.

Enhancing processes of continuous improvement through the use of indicators, highlights the need to monitor work processes and the consequent correction of behaviors,

…the fact that you have to ask for PPE every day… you managed daily, you started to see how was the adhesion, …This is my process and result indicator E1.

Recognition of work performance it was a tool used to maintain high levels of motivation and security

... Our health care assistants, …show them how important is their work... then, they felt more valued … E6.

Discussion

From the Nurse Managers' point of view, the pandemic brought visibility and appreciation to the proper use of PPE, drawing attention to the consequences of exposure to Covid-19 and the consequent need to promote adherence to its correct use by health professionals (6), thus being a facilitating factor.

When analyzing the determinants that underlie this change, fear and changes in risk perception were the most mentioned emotions. Moderate levels of fear can have a positive effect on behavior change, resulting from the individual's perception of desirable consequences, as opposed to perceived threats, constituting a determinant to be considered in the processes of changing the behavior of health professionals. It was also mentioned the role that the information transmitted daily by the media had in changing behaviors, conceptualizing them as a source of motivation (5).

On the other hand, there were changes in the social representations associated with risk, i.e. changes in the perception of risk about the impact and severity of Covid-19, as well as the perception regarding the benefits of adhering to the use of PPE and that may have increased adherence to the use of PPE (4,5).

The positive impact that teamwork assumed is highlighted directly interfering with the motivation to adhere to PPE use and, consequently, in the safety of the work environment (9). It was noted by the Nurse Managers an increase in the levels of resilience, versatility and multidisciplinary team support, which was attributed to the fact that professionals in times of crisis assume different work dynamics from the usual ones, allowing self-regulation associated with the correct use of PPE (10)

Concerning group relationships, the distortion perceived in moments of break is highlighted, like the disbelief that in these moments they could be more vulnerable to being infected by colleagues, also not perceiving benefits that promote the use of PPE during break times (4).

The study participants experienced different situations related to human resources management, noting that, according to the frequency of occurrence, the constraints were more evident related to the reorganization of staffing numbers in order to fulfill the requirements adapted to the new clinical situation. In this context, it was essential to define

strategies that ensured the staffing for each professional category and quick recruitment forms and integration, related to the need to allocate dedicated professionals and respond to high rates of absenteeism related to Covid-19 (6).

This reorganization required the reinforcement of the teams with professionals with differentiated skills, the requalification of these skills and the inclusion of professionals with no work experience, without integration time. These were situations that were felt as negative experiences by the teams, creating instability, insecurity and affecting the training in the use of PPE, which implied, from the Nurses Managers, extra care to ensure their management, in terms of availability and skills, to guarantee safety and that the best possible care was provided to patients (9).

The use of professionals considered references for the teams was highlighted in the interviews as a way of monitoring, helping and contributing to these teams and, consequently, becoming the model for training in the use of PPE for less experienced professionals (7). On the other hand, it was recognized that the physical environment, especially in inpatient services, could compromise the prevention of biological risks, risking the physical integrity of workers (10, 11).

The contribution of the nurse manager in the control of these work environment is highlighted, with regard to the structural conditions, but also in the rationalization of material resources, namely PPE. Rational access to PPE was considered a challenge for nurse managers, who had to implement new strategies, based on a global management of access and use, using daily requests for PPE, control in allocation, individual distribution and development of processes of monitoring their use, ensuring the supply, training of professionals and the implementation of measures that minimize its need and inappropriate use (6,12).

It was found that the ease and availability of PPE was mentioned more frequently and an effort by the institution was perceived to make this equipment available mainly in dedicated areas, however, there were situations in which it was necessary to resort to improvised practices, in an attempt to fill the existing gaps that further increased the risk of exposure by incorporating these practices into daily activity, accepting them as normal and safe (13).

It should be noted that, although an increase in the use of PPE was perceived, it is inappropriate use related to excessive use and errors in use was felt as the main problem in the safety of professionals, being the basis of self-contamination, referring to the importance of the co-responsibility of professionals in the adoption of self-protection measures and, in this context, in the correct adherence to the use of PPE, selecting the most appropriate protection barriers and compliance with the guidelines for its use (10,11).

Also to be considered is the quality and inadequacy of PPE as barriers to the adherence processes, as it promotes the loss of technical skill and causes discomfort to professionals, so these should be aspects to be considered by managers as resistance to adherence to PPE use (14).

Investment in knowledge, training of professionals and training on the use of PPE were essential for professionals to be able to develop their activity in a context different from what they were qualified for (11). The Nurse Manager assumed a prominent role through the organization in formal and informal training moments, moment of practice and respective supervision, which according to the participants were key to acknowledge the norms and procedures, these had a great impact on the training of professionals for the use of PPE (1,12).

The flows and constant production of new information during the pandemic were perceived as hindering to the adherence to PPE use, related to the guidelines to be followed. In organizational terms, the difficulties were linked to decentralized strategy flows and actions that promote constant changes in practices, generating uncertainty and insecurity in relation to the decisions to be taken. According to nurse managers, communication policies should, in addition to ensuring the quality of information, reach a higher number of people simultaneously, which would help in raising awareness and standardizing the procedures (6,15).

To achieve objective communication flows, with clear and continuous information in their teams, it was necessary for Nurse Managers to resort to new communication strategies, using different tools (pre-shift team meetings, check-ins, updated newsletters, team groups on social networks), ensuring transversal information, safe environments and eliminating sources of dissatisfaction and conflict (9,16).

This study highlights the impact that the organizations' leadership style and the managers can have on work environments and on the ability to model postures and behaviors related to decision-making for PPE use, by eliminating perceived barriers and beliefs that individuals associated with the use of this equipment, through the development of favorable conditions to the promotion of healthy environments (9,16).

It was perceived that institutional guidelines about the protection of professionals are based on imposed policies, not acknowledged by health professionals, which makes sustained behavior changes difficult. The lack of involvement and commitment from different management levels was also perceived by the different levels of management, which negatively impacts the construction of safe environments (2).

In this sequence, the need for monitoring and control of activities was evidenced by Nurse managers in compliance with the rules related to adherence to PPE, which implied full availability in monitoring professionals and constant monitoring of working processes by Nurse managers, enhancing safety within teams and promoting feelings of belonging, integration, recognition and sharing of goals, which resulted in increased well-being, increased motivation and, consequently, increased quality of care (1,9).

In the interviews was also highlighted the importance of appreciation by hierarchical superiors and their recognition regarding the risk to which professionals are exposed, in addition to providing emotional support, with an impact on personal satisfaction and motivation, which in turn can be perceived as a stimulus to the compliance with guidelines related to adherence to the PPE use (9).

Limitations of the study

The limitations of the study are related to the fact that the methodology used prevents generalization, also being carried out in a hospital and in a pandemic context.

Conclusions

The environmental conditions had a direct impact on the professionals' perception of biological risks and on the relevance attributed to the different adherence conditioners found, taking into account that, depending on the contexts, several subcategories were perceived by the Nurse Managers as facilitating or hindering adherence to the use of PPE.

In addition to environmental factors, the importance of the impact of personal factors on the behavior of professionals should be highlighted, considering the frequency of occurrence obtained in the interviews, namely the conditioning factors of emotional states with the greatest impact on promoting adherence and the compromised use of adherence to PPE with the greatest impact on the safety of health professionals, enhancing exposure to risk.

Strategically, the need for the involvement of nurse managers in the safety of professionals is highlighted through the development of proximity practices, assuming that the management profile is directly related to the appreciation that professionals give to the correct use of PPE.

The role of Nursing managers is highlighted through their skills in the demystification associated with biological risk and the use of PPE and that only the development of strategies that promote safe environments allows sustained behavioral changes, regardless of the pandemic context.

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