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Individual and Organizational Conditions Leading to Quality of Care in Healthcare: A Fuzzy-Set Qualitative Comparative Analysis

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Abstract: Quality of care is a complex performance measure of healthcare performance that considers the influence of several contributors. This study enlarges our understanding of how such influences occur. We analyze individual and organizational level characteristics that have a complex relationship with quality of care. We examine specific patterns that lead to both the presence and absence of quality of care using a fuzzy-set qualitative comparative analysis. Our data comes from an online survey of healthcare professionals from a Portuguese university hospital, namely nursing and medical professionals. Our results reveal that combinations of individual-level characteristics, such as the quality of social support among professional peers and the perceived robustness of social networks, contribute to perceptions of quality of care. In addition, the results indicate that combinations of organizational-level characteristics, such as the presence of ethical leadership and the awareness of knowledge management systems, also lead to perceptions of quality of care. The solutions leading to the presence and absence of quality of care are discussed. We conclude that managerial practices in the university hospital should foster informal communication and peer support, given how pervasive their influence is on quality of care, even in circumstances where ethical leadership and awareness of knowledge management systems are absent from the configurations. Additionally, we reveal combinations of both individual-level and organizational-level characteristics that generate the absence of such quality of care, and thus we alert managers for the need to fight such situations.

Keywords: social networks; social support; ethical leadership; knowledge management systems; quality of care

1. Introduction

The quality of medical care considers the outcomes of organized healthcare systems and actions aimed at improving the health and well-being of patients [1]. The quality of medical care provided to patients comprises vast phenomena; consequently, it is impacted by multilevel factors of influence [2–5]. The rise in demand for healthcare quality coupled with advances in clinical practice and the associated costs has led to concerns over the validity and reliability of satisfaction as a stand-alone measurement of clinical practice [6]. The current COVID-19 pandemic context further stresses this demand through the assessment of present [7] and future quality of care [8]. In particular, due to the critical demand to maximize patient care in a short time span [8]. Accordingly, while the focus on quality of provided medical care has shifted from costs and activity towards the importance of the resources, evidence shows that individual- and organizational-level factors impact healthcare workers' delivery of quality of care. Healthcare professionals' self-assessments and perceptions of quality of care are strong indicators of such outcomes [4,9]. Thus, the quality of medical care provided to patients is influenced by healthcare workers' attitudes and work situations [4,10,11]. The quality of provided care grounded in the work environment has an organizational level of control that can be improved by addressing specific characteristics such as staffing [12,13], organizational preparedness [14,15], and leadership [15–19].

Similarly, individual-level characteristics can also lead to the improvement of the quality of provided care [20,21]. Therefore, evidence shows that an understanding of social networks in healthcare environments is of importance to understanding social aspects contributing to improved quality of care [22–24].

The recent healthcare literature addresses such impacts, detailing the importance of poor perceptions of social support hindering professional outcomes among healthcare workers at the individual level [24,25]. Nevertheless, such characteristics are often assessed individually or categorically [20]. This operationalization presents a research gap towards the exploration of such individual characteristics in combination with organizational structures and processes leading to quality of care. Similarly, while leadership is related to outcomes of improved quality of care provided to patients [18], the impact of specific leadership types on quality of care remains unexplored. Such is the case of ethical leadership [18,26], whose concept is being challenged in the healthcare context [26]. On the other hand, knowledge management initiatives have aimed to improve perceptions of quality of care by stimulating knowledge mobilization among healthcare professionals and patients [15]. Knowledge management frameworks, while still a "positive deviance" inside healthcare organizations [27], rely on similar social and organizational structures to improve the quality of care [14].

To address this gap, our research shifts quality of care assessment from the patient's perspective to a healthcare professional's self-assessment perspective. Specifically, our research aims to understand the impact of the perceptions of quality in social support, the presence of robust social networks (as individual characteristics), the healthcare professionals' awareness of ethical leadership, and the existence of knowledge management systems (as organizational characteristics) in healthcare professionals' perception of the quality of care provided to patients. We used a fuzzy-set qualitative comparative analysis (fsQCA) to provide a three-fold contribution. First, to assess quality of care under a complex causal configuration approach, we analyzed the relationship between individual and organization characteristics in a nonlinear fashion. Second, to understand such characteristics' impacts on quality of care, we shifted patient assessment towards healthcare workers' self-assessment. Third, we offer insights into work-based strategies to advance professional outcomes in the context of healthcare workers' management.

2. Literature Review

2.1. Supportive Social Networks and Quality of Care

A social network can be defined as a social structure in which social interactions between actors take place in different patterns and under different forms of affiliation [28]. Accordingly, analyzing social networks can provide insight into relationships connected by ties of interdependency—with trust, communication, and kinship as their basis. In the context of healthcare research, social network ties are of utmost importance in influencing medical practice and thus improving healthcare outcomes [20]. Evidence surrounding healthcare workers suggests that analyzing social networks can provide insights into defining and understanding professional communication networks [20,23,29], something that, in turn, can enhance social network interventions to improve medical performance and quality of care [30]. Engagement and empowerment among healthcare workers through the provision of peer support and supportive supervision is crucial for the development of medical care, especially during times of extreme adversity [22]. Conversely, dispersed or poorly connected social networks displaying a lack of peer support are linked with perceptions of lack of support among several healthcare stakeholders, leading to professional burnout and to negative impacts in the care provided to patients [30,31]. Evaluations of social network characteristics and their effects on patient outcomes are thoroughly discussed in the literature [20,23,32–37]. Nevertheless, research on the relationship of social networks with the quality of medical care provided to patients is largely conducted at both categorical and singular levels [20,21]. Therefore, the characteristics of healthcare networks are addressed as a whole in terms of their direct values and perceived value among

healthcare workers. Consequently, while calls for action address limitations and research design recommendations [21], social network research in the scope of healthcare workers still presents a unified, categorical construct, being understudied when paired with other characteristics leading to quality of care and care improvement. This presents a research gap that we aim to address in this study. Developing on the *interdependent* relationship rationale between characteristics leading to quality of care [38], we argue that perceptions of a robust social network, paired with perceptions of social support between healthcare workers, are conditions related to quality of medical care. As such, this perspective leads to the following research questions (RQ):

RQ1: How does the robustness of social networks contribute to the quality of care provided to patients in a university hospital environment?

RQ2: How does social support among healthcare workers contribute to the quality of care provided to patients in a university hospital environment?

2.2. Ethical Leadership and Quality of Care

Ethical leadership can be defined as a demonstration of appropriate conduct, driven by norms, reflected through personal actions and relationships that promote such conduct to followers [39,40]. Therefore, an ethical leader serves as a role model whose appropriate behavior is deemed acceptable and worth following. Ethical leaders deploy transparent communications that justify their actions to followers, following and setting new ethical standards in the process [39,41]. Accordingly, ethical leadership is deemed a positive form of leadership, one that incorporates ethics into the decision-making process while blurring personal characteristics of leaders in favor of their positively perceived behavior [39,42]. Considering the scope of healthcare organizations, ethical leaders are expected to create and foster an appropriate environment for the provision of increasing demands in both cost and quality of provided care, while ensuring ethical behaviours inside their working teams [43]. Nevertheless, growing pressures and changes to the delivery of healthcare in recent years are identified in the literature as drivers that also need to transform and redefine ethical leadership among healthcare workers [26]. Such changes in conventions and healthcare practices were further exacerbated by the COVID-19 pandemic, hinting at challenges that reflect new and revisited ethics burdens for leaders in present and coming years [44,45]. Thus, ethical leaders in healthcare are expected to provide consistent and rational leadership. They are responsible for providing safe, quality care and deciding upon strategies that are anchored in collaboration, innovation, creativity, and ethical behavior [44]. Ethical leaders are, at the macro level, responsible for tending to the populations they serve and, at the micro level, accountable for the way individual care is deployed to patients [26]. Conversely, evidence shows that nurses [43] and medical doctors [46] who perceive their leaders as more ethical tend to be more committed and perceive their professional outcomes more positively. When expanding to the organizational level, such expectations echo possible outcomes grounded in the development of both professional and patient ethical standards alike [26,45]. Nevertheless, while thoroughly discussed under the contemporary concerns of job satisfaction and the alignment of new patient-care standards, the role of ethical leadership in the quality of care remains unexplored under the self-assessment of healthcare workers. Expanding on qualitative evidence found in nurses [43] regarding the professional outcomes of having ethical leaders in their work teams, we argue that healthcare workers who perceive their managers as ethical leaders are more likely to perceive an increase in the quality of care they provide to patients. Therefore, and considering the interdependent nature of quality of care, we present the following research question:

RQ3: How does ethical leadership contribute to the quality of care provided to patients in a university hospital environment?

2.3. Knowledge Management Initiatives in Healthcare

Knowledge management systems rely on the facilitation of knowledge creation and knowledge sharing through the combination of a multidisciplinary approach [47]. As structural part of organizational learning, knowledge management systems and initiatives contribute to multi-level learning through the combination of strategy, technology, culture and leadership from the inter-organizational to the individual level [48]. The healthcare sector, as an example of such knowledge management influence on organizational learning, relies heavily on knowledge as a resource for attaining competitive and innovative outcomes related to medical performance and care [49]. Found under the scope of a knowledge-intensive industry, healthcare organizations' development of knowledge management frameworks has still-pervasive problems [50], with both individual- and organizational-level barriers undermining knowledge initiatives [14,27,51,52]. Nevertheless, evidence shows that, regardless of the organizational type or structure, healthcare workers perceive, rely on, and acknowledge the importance of knowledge dissemination and development in their professional outcomes [53,54]. Similarly, decreased medical knowledge and experience can lead to unrealistic expectations among healthcare staff, thus leading to feelings of burnout and compromising patient care [55].

Knowledge management activities can promote quality of care, especially when combining personnel engagement in a flexible manner [56]. This further underpins Campbell's [38] view of quality of care as an interdependent process relying on several drivers to ensure this professional outcome. Additional evidence also shows that, even under strict systems with high control (e.g., ICU units), informal knowledge flows still take place [57]. This evidence also paves the way for concern about knowledge hiding behaviours' impact on healthcare performance, with recent literature discussing a need for inclusion of knowledge hiding as a core knowledge mobilization behavior impacting healthcare performance [54]. Nonetheless, recent findings expand on this view by addressing knowledge mobilization practices as threefold [49,58]. Accordingly, knowledge mobilization behaviours influence [58]:

(a) Collaboration processes in healthcare environments, combining fragmented information into distributed medical knowledge;
(b) Support for underlying cognitive processes that codify abstract medical knowledge into practical development;
(c) Innovation acting as a catalyst to expand beyond formal and informal processes and policies, resulting in further informal processes and policies—acting as a force of change that aims to improve patient security and controlled quality of provided care.

Healthcare workers acknowledge the importance of knowledge dissemination and development in their professional outcomes [53,54] and the interdependent nature of quality of medical care, thus we present the following research question:

RQ4: How does the awareness of knowledge management systems contribute to the quality of care provided to patients in a university hospital environment?

While we propose that such conditions are related to the quality of care provided to patients, the literature shows that quality of medical care is achieved through the benefits of flexible approaches that rely heavily on managerial practices, personnel engagement, and measurement control of internal and external factors [56,57]. Hence, we argue that, while related to quality of care, the identified antecedents display a complex causal relationship leading to that outcome. Analyzing quality of care can be assessed under key domains based on structure, processes, and outcomes that rely on interdependence to achieve opportunities for improved care [38]. Parallels can be drawn when analyzing both individual and organizational characteristics in terms of their theoretical relationships. Considering such complexities, we argue that the characteristics of this study display a nonlinear, causally complex relationship with quality of care, hinting at a flexible, combined approach. Accordingly, we present the following research questions:

RQ5: Are there alternative configurations of conditions that lead to quality care?

RQ6: Are there alternative configurations of conditions that lead to the absence of quality care?
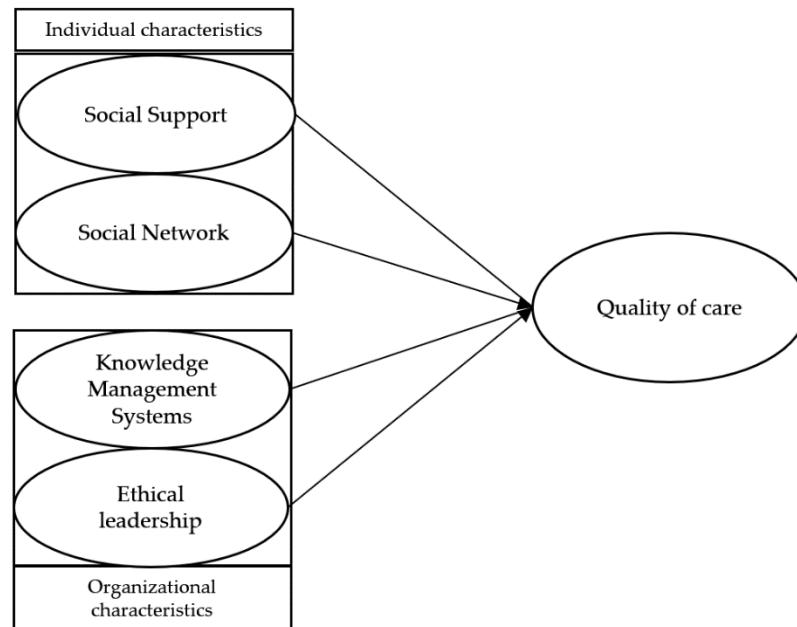
Figure 1 presents the research model.

Figure 1. Research model.

3. Methods

The fuzzy-set qualitative comparative analysis (fsQCA) is an analytic technique combining quantitative and qualitative methodologies [59]. Expanded from the qualitative comparative analysis, the fsQCA allows the transformation of qualitative data into quantitative values [60] by allocating or assigning membership values on used scales [61]. Developed as a research methodology that analyses causal relationships through systematic comparisons, the fsQCA expands on the method of difference [59]. That is, if there are differences among the causes leading to the presence and the absence of a specific phenomenon, then those differences serve as a necessary part of the phenomenon. As such, the fsQCA is a valuable method for the exploration and examination of complex causality [62]. Relying on Boolean algebra principles, the fsQCA offers an exploration of causal phenomena while considering asymmetries between the characteristics (here designated conditions) leading to the presence and absence of the outcome. This holistic, integrated approach is justified in the context of this research, with previous uses of fsQCA found in the context of healthcare research. Namely, when studying healthcare workers' performance during the COVID-19 pandemic [7], or conditions leading to knowledge sharing amongst healthcare researchers [63]. This tool is suitable given the need to understand interactions and independencies among conditions resulting in quality care. Furthermore, achieving quality of provided care to patients is a lengthy, multilevel process that relies on flexible approaches to control internal and external factors [38,56,57]. This interdependence of factors leading to quality of provided care to patients [38] further fits the suitability of this research methodology, establishing complex causality and interdependence of conditions for solutions leading to both the presence and absence of the outcomes [62].

3.1. Instrument and Measures

We use a survey adopting scales from the literature. We use several sources for the constructs in order to minimize research concerns over common-method variance [64]. Individual characteristics include the usage of the social network scale (adapted from

Chow and Chang [65]) and the perceived quality of the social support scale (adapted from Morgeson and Humphrey [66]). Organizational characteristics include the usage of the ethical leadership scale (adapted from Brown, Treviño and Harrison [39]), and the perception of knowledge management systems scale (adapted from Serenko and Bontis [62]). Finally, the main research outcome, the quality of care provided to patients by healthcare professionals, is measured with the quality-of-care scale (adapted from Aiken et al. [2]). The research constructs acting as conditions for this study are summarized below:

Social network—The perception of frequency and existence of relationships between healthcare students and professionals that occur in addition to formal ties [65,67]. We use social network as a condition (network) to assess the contribution of frequent, informal relational ties among healthcare workers on their perceptions of the quality of medical care provided to patients inside the hospital.

Perceived quality in social support—The perception of social supportive behaviours coming from the social network that foster positive reciprocity and emotional states [65]. We use perception of social support as a condition in its presence (support) and absence (~support) to assess the contribution of social supportive behaviours among healthcare workers on their perception of the quality of medical care provided to patients.

Ethical leadership—Individual perceptions of a manager's leadership style, guided by ethical beliefs, rooted in moral values deemed desirable or appropriate in their social group [39]. We use ethical leadership as a condition in its presence (ethiclead) and its absence (~ethiclead) to assess the contribution of ethical leaders on healthcare workers' perceptions of the quality of medical care provided to patients.

Knowledge management systems—Awareness by individuals of organizational systems, mechanisms, policies, and practices that foster and facilitate knowledge mobilization inside their organizations [68]. We used knowledge management systems as a condition in its presence (systems) and its absence (~systems) to assess the contribution of healthcare workers' awareness of knowledge management systems existing in the organization to the quality of medical care provided to patients.

The research outcome is defined:

Quality of care—The degree to which healthcare staff perceives the current quality of patient care they have been providing [2].

3.2. Data Collection and Sample

The sample data comes from a Portuguese university hospital. We took several ex-ante measures to avoid the common-method variance found in cross-sectional studies [64]. The survey was developed and deployed through the Qualtrics® web platform. Participants received an email providing an anonymous link leading to the survey. Accordingly, anonymity and confidentiality were assured. Questions were counterbalanced and randomized. We sent the survey to the healthcare staff (615 healthcare professionals) and retrieved 173 responses, corresponding to a 28.13% response rate. After cleaning procedures [64], the final sample for this study comprises 51 complete and valid responses.

Regarding gender differences, most respondents identified as female (76.5%), with the remaining participants identifying as male (23.5%). The age distribution of the respondents is balanced, with 49.1% of the respondents under 35 years of age. Table 1 presents the demographic information of the sample.

Table 1. Sample demographics (*n* = 51).

Demographics		*f*	%
Gender	Female	39	76.5%
	Male	12	23.5%
Age Group	18–24 years	11	21.6%
	25–34 years	14	27.5%
	35–44 years	15	29.4%
	45–54 years	7	13.7%
	55–64 years	4	7.8%
Professional Experience	0–5 years	18	35.2%
	6–10 years	7	13.4%
	11–15 years	7	13.4%
	16–20 years	10	19.2%
	21+ years	9	17.3%
Healthcare professionals	Medical doctors	11	21.5%
	Nurses	18	35.2%
	Researchers	2	3.9%
	Pharmacists	19	37.2%
	Psychologists	1	1.9%

3.3. Reliability Analysis and Calibration of Research Conditions and Outcome

The study uses constructs previously validated from the literature; nevertheless, we conduct a reliability analysis for all the measures. Cronbach's alpha values are adequate for all constructs ($\alpha > 0.7$). Similarly, both composite reliability ($CR > 0.7$) and average variance extracted ($AVE > 0.5$) are also above the recommended thresholds for all the constructs [69]. All the constructs indicate the presence of internal consistency, convergent validity, and discriminant validity. Table 2 presents the results from the reliability analysis.

Table 2. Composite reliability, AVE, Cronbach's alpha, squared root of AVE, and construct correlations.

Constructs	Composite Reliability	AVE	Cronbach's Alpha	1.	2.	3.	4.	5.
1. Social Network	0.924	0.803	0.880	**0.896**				
2. Perceived quality of social support	0.874	0.542	0.831	0.684	**0.736**			
3. Ethical leadership	0.970	0.764	0.965	0.386	0.540	**0.874**		
4. Knowledge Management Systems	0.966	0.761	0.960	0.400	0.501	0.558	**0.873**	
5. Quality of care	0.838	0.573	0.740	0.424	0.467	0.470	0.577	**0.757**

Note: The square root of the AVE is along the diagonal in bold.

The use of fsQCA demands data calibration. Calibration process is defined by the transformation of datasets into fuzzy-set membership scores [61] from zero to one. Given the Likert-like nature of the scales used in this research, the use of the constructs' measures is performed by calculating the average values of each item of the latent variables [70]. This calibration technique converts variables into conditions respecting three anchors of classification [61]. Accordingly, conditions were classified from full membership (1.0) to full non-membership (0.0) for each score. Given the qualitative nature of this research method, the threshold for ambiguity is classified as the midpoint in the fuzzy set (0.5). Table 3 presents the descriptive statistics and calibration of the research conditions and outcome.

Table 3. Descriptive statistics and calibration of casual conditions and outcomes.

Conditions	Descriptive Statistics	Calibration [a]
Social network (network)	μ = 5.30, σ = 1.25, min = 2, max = 7	(6.9; 5.5; 3)
Quality of social support (support)	μ = 5.29, σ = 0.98, min = 1.5, max = 7	(6.4; 5.6; 3.9)
Ethical leadership (ethiclead)	μ = 4.80, σ = 1.52, min = 1, max = 7	(6.75; 4.75; 3.3)
Knowledge management systems (system)	μ = 5.00, σ = 1.44, min = 1, max = 7	(6.9; 5.4; 1.2)
Quality of care (qcare)	μ = 4.76, σ = 0.89, min = 2.5, max = 6.75	(5.9; 4.6; 3.8)

[a] Cutoff values (0.95; 0.50; 0.05).

4. Results

Necessity and Sufficiency Analysis

We follow the fuzzy-set qualitative comparative methodology and conduct the necessity analysis, which presents the extent to which the studied conditions are needed to achieve the outcomes, and the sufficiency analysis, which presents the extent to which the studied conditions can be related to explaining the outcomes [69].

Regarding necessity analysis, consistency values for both presence and absence (~) of conditions remained below the recommended threshold (0.90) [61]. Therefore, neither the presence nor the absence of each of the studied conditions alone is necessary for the presence (Table 4) or absence (Table 5) of quality care. Given previous studies discussing the necessity of combining different structures and processes to maximize good medical care [38,56,57], such results corroborate the literature.

Table 4. Analysis of necessary conditions for qcare.

Outcome Variable: Qcare		
Conditions Tested	**Consistency**	**Coverage**
network	0.741743	0.717585
~network	0.580859	0.637785
support	0.704953	0.766189
~support	0.614677	0.614677
ethiclead	0.749855	0.769514
~ethiclead	0.613947	0.632963
system	0.804683	0.794248
~system	0.596543	0.640568

Table 5. Analysis of necessary conditions for ~qcare.

Outcome Variable: ~Qcare		
Conditions Tested	**Consistency**	**Coverage**
network	0.650697	0.594510
~network	0.690894	0.716433
support	0.566230	0.581205
~support	0.772214	0.711962
ethiclead	0.623034	0.603826
~ethiclead	0.762182	0.742108
system	0.645568	0.601775
~system	0.779275	0.790269

Regarding the sufficiency analysis, we followed the suggested inspection of both intermediate and parsimonious solutions [62] according to best practices [61,70]. The most parsimonious solution contained only conditions highly linked to the outcome. The intermediate solutions are more conservative and assumed more simple and plausible assumptions [61]. We verify that all conditions in the solutions are core conditions (conditions present in both the parsimonious and intermediate solutions) [60,61,70] (Tables 6 and 7). Since fsQCA allows asymmetry, the conditions for quality of care differ from those for its

absence [58]. Black circles indicate the presence of a condition (●), whereas blank circles indicate its absence (○). Blank spaces represent conditions that did not matter for that specific configuration. All configurations for presence and absence are labeled with consideration to their contributions and patterns leading to the outcome. Table 6 presents the intermediate solution for the presence of quality of care. Table 7 presents the intermediate solution for the absence of quality of care. Such results are consistent with the nature of the fsQCA, where necessary conditions are often different from sufficient conditions [71].

Table 6. Intermediate solution for the presence of the outcome.

Intermediate Solution for Quality of Care (Qcare) [a]							
Model: Qcare = f (System, Ethiclead, Support, Network)					Coverage		
Configurations	System	Ethiclead	Support	Network	Raw	Unique	Consistency
Conf 1 (org. based)	●	●	○		0.449999	0.140627	0.914783
Conf 2 (mixed based)	●	○	●		0.406544	0.003651	0.906362
Conf 3 (mixed based)	○	●	●		0.388667	0.013655	0.897763
Conf 4 (ind. based)		○	●	●	0.393757	0.003962	0.895549
Conf 5 (ind. based)	○		●	●	0.377766	0.000000	0.8737545

[a] Overall solution coverage: 0.661677; overall solution consistency: 0.860152.

Table 7. Intermediate solution for the absence of the outcome.

Intermediate Solution for the Absence of Quality of Care (~Qcare) [b]							
Model: ~Qcare = f (System, Ethiclead, Support, Network)					Coverage		
Configurations	System	Ethiclead	Support	Network	Raw	Unique	Consistency
Conf 1 (mixed based)		○		○	0.626765	0.034956	0.854710
Conf 2 (mixed based)		○	○		0.683802	0.022484	0.832223
Conf 3 (mixed based)	○		○		0.688765	0.057041	0.880697

[b] Overall solution coverage: 0.775799; overall solution consistency: 0.804221; qcare = quality of care; system = knowledge management systems; support = quality in social support; network = social network.

Consistency reflects the extent the conditions display the outcome [60–62]. Overall solution consistency is above the recommended threshold for both models (>0.80) [61,62]. Configurations for the presence and absence of perceived quality of care had consistency levels of 0.86 (qcare) and 0.80 (~qcare). Solution coverage, in turn, addresses the variation of the outcome accounted for by the combination of conditions in the configurations [60–62]. Overall solution coverages display acceptable levels within the suggested threshold range (0.25–0.90) [72].

To better provide insights to the discussion of results, we termed each individual configuration considering its combinations leading to the presence (Table 6) and the absence (Table 7) of quality of care. Therefore, configurations displaying the presence of organizational characteristics (system, ethiclead) are labeled "org. based", pointing to the relevance of the organizational characteristics' contribution to quality of care. In turn, configurations presenting the presence of individual characteristics (support, network) are labeled "ind. based", pointing to the relevance of individual characteristics' contribution to quality of care. Finally, configurations displaying both individual and organizational characteristics were labeled "mixed based".

Tables 6 and 7 present the consistency and coverage for all individual configurations and the overall solution for each model. For example, the consistency of configuration "Conf 1 (org based) Table 6" is 0.914783, meaning that in 91.48% of the cases where this configuration of conditions is present, quality of care occurs. Conversely, the coverage level of the same configuration is 0.44999, meaning that in almost 45% of cases, quality of care happens due to this configuration.

Results also show that conditions are unrelated or even inversely related to other conditions between configurations. For both the qcare and the ~qcare models, results show that more than one configuration of conditions leads to the outcomes, with more configurations leading to quality of care (five) than to its absence (three). One additional finding lies in the differences between outcomes. The configurations leading to quality of care show presence and absence of specific conditions. Unlike, the outcome absence (~qcare) presents a three configurations' solution that only displays the absence of conditions contributing to the configurations leading to the absence of the outcome. This non-inverted relationship underpins the asymmetry between the solutions for the presence and absence of the outcome—a characteristic made possible by the fsQCA analysis [62].

5. Discussion

The results show that all studied conditions are core conditions for both solutions leading to the presence and absence of quality care. This is consistent with the intricate interdependencies surrounding the delivery of the best possible medical care to patients [38] and its complex relationship with healthcare workers' attitudes and work environments [4,10,11]. Regarding causal configurations, the results show five configurations leading to the presence of quality of care (qcare). A strong perception of social support among peers (support) is present in four of the configurations in a complex relationship with the other conditions. Such results stress the importance of fostering a peer support culture among healthcare workers, given the evidence surrounding the improvement of medical outcomes when distinct facets of peer support and engagement are assessed in the context of social networks [20,23]. The social network condition, on the other hand, while only being present in two of the configurations leading to qcare (Conf 4, 5—Table 6), stressing the importance of robust social networks, regardless of their category, as an important condition leading to qcare [20,22,31–37]. On the other hand, the presence of awareness of knowledge management systems and ethical leadership can contribute to qcare even when social support is absent (Conf 1—Table 6). Therefore, in circumstances when the quality of social support by peers is deemed poor, an awareness of existing knowledge management systems paired with ethically perceived leaders among healthcare workers still supports the delivery of good qcare. Such results follow the importance given by healthcare workers to knowledge dissemination and development in achieving better collaboration, support, and innovation [58]. Additionally, ethical leaders serve as role models whose appropriate behavior is deemed as acceptable and worth following. Such appropriate behavior can be converted to new and improved standards [39,41], and therefore, supporting qcare. Two configurations (Conf 2, and 4—Table 6) show that even in the case of the absence of ethical leadership there is still a possibility to offer qcare. Nevertheless, while ethical leadership is absent, both configurations show the presence of either social support and robust social networks, or social support and awareness of knowledge management systems. Such result suggests that, even in circumstances where ethical leadership is absent, healthcare workers can still be driven towards providing qcare if relationships among peers are valued or informal communications sustain the organization. We propose that the need to maintain ethical behaviours under new and constant demands can shift from leaders to peers when perceptions of ethical leadership are absent. That is, that the standard of ethical behavior is diverted towards work peers through the development of social norms grounded on caring and support for one another in such circumstances. Two configurations stress the importance of the individual characteristics leading to the presence of qcare (Conf 4, 5—Table 6). In the two configurations, organizational factors remained irrelevant or even absent from the configuration. Such findings seem to explain the quasi-accidental nature of knowledge flow in healthcare settings if communication channels are available and fostered [49]. Similarly, the absence of knowledge management systems inside the healthcare organization can still lead to the presence of qcare (both in Conf 3, 5—Table 6) This further underpins the professional importance given by healthcare workers to communication and information flows [49,58], even in circumstances where formal systems of knowledge management

are not recognized or identified. The five configurations in Table 6 lead to the presence of qcare, each one involving a combination of three conditions and thus suggesting that the presence of qcare is demanding in this healthcare setting.

Regarding the causal configurations leading to the absence of qcare (~qcare) three configurations are presented. There were fewer configurations leading to ~qcare (three) than to qcare (five). Nevertheless, each configuration requires only the combination of two conditions (specifically, their absences), thus making the combinations leading to the absence of quality of care easier to achieve than the ones leading to qcare. This contrasts with the larger number of configurations leading to qcare (five) and further corroborates the complex and interdependence nature of characteristics leading to qcare [38]. Results also show that only the absence of the conditions is related to ~qcare. One of the configurations (Conf 1—Table 7) shows that the absence of ethical leadership paired with the absence of robust social networks led to ~qcare. Such a result in this context inversely corroborates evidence coming from previous research. Ethical leaders can foster collaboration and innovation while ensuring channels of communication [44]. Nevertheless, evidence shows that an absence of identifiable leadership, compounded by communication issues, can lead to a shortage of social networks, exacerbating professional isolation [21], thus compromising qcare provided to patients. Equally, the absence of ethical leadership is also paired with the absence of quality of social support as conditions leading to ~qcare in one configuration (Conf 2—Table 7). This further corroborates evidence presenting connections between ethical leadership and a sense of social support. The absence of ethically perceived leaders is related to reduced collaboration and accountability [44], leading to ~qcare.

The last configuration (Conf 3—Table 7) shows that the absence of knowledge management systems, when paired with the absence of quality of social support, led to ~qcare. This result also inversely corroborated previous research in the healthcare context. Knowledge management systems, while contributing to medical care and performance, rely heavily on communication to be successful [27]. In particular, knowledge management activities can promote qcare, especially when combined with personnel engagement in a flexible manner [56]. Similarly, in circumstances where both knowledge management systems and social support among peers are absent, so will be the perception of qcare provided to patients.

Results also show asymmetry with similar configurations for the solution of presence and absence of quality of care. Nevertheless, while some configurations leading to the qcare only combined individual (Conf 4, 5—Table 6) or organizational conditions (Conf 1—Table 6), all the configurations leading to ~qcare combined both (Table 7). This insight shows that, while easier to achieve, absence of quality of care combines the absence of both individual and organizational characteristics. As such, strategies focused on countering ~qcare should further focus on interdependence [38], and account for the more diluted, less focused circumstances leading to such outcome.

Our findings provide insight for the research questions, given the solutions found in Table 5.

RQ1: Robust social networks contribute to qcare in several ways. Robust social networks are present in two configurations leading to quality of care (Conf 4, and 5—Table 6) and it is found combined in circumstances where the absence of organizational conditions took place. Such results suggest parallels to the complex, multilevel impacts of strong social networks that might counter a lack of awareness of organizational systems and leadership roles through the quality and frequency of communication flows.

RQ2: Social support in the workplace contributes to qcare in several ways. It is found in four out of the five configurations leading to qcare. Social support in the workplace is absent in one configuration leading to the presence of quality care, results show that its absence is also found in two of the three configurations leading to ~qcare. As such, social support in the workplace is a major contributor to qcare in this university hospital environment. Consequently, it should be included in the development of strategies aimed at maximizing such an outcome.

RQ3: Ethical leadership contributes to quality of care in several ways. As a condition, its presence is relevant for two configurations leading to the presence of quality of care (Conf 1, and 3—Table 6). Results show that circumstances where the presence of ethical leadership is combined with social support could lead to the presence of quality of care if the awareness of knowledge management systems is absent (Conf 3—Table 6). Similarly, the presence of ethical leadership is also found in one solution leading to the presence of quality of care when an awareness of knowledge management systems is present, but the quality of social support is absent (Conf 1—Table 6). This combination with individual characteristics contributes to further configurations leading to the absence of quality of care (Conf 1, and 2—Table 7). This balanced role of ethical leadership allows for an exploration of flexible strategies when promoting quality of care in the university hospital, allowing for individual or mixed levels of intervention. Furthermore, such results further underpin the pivotal nature of ethical leaders in the context of healthcare. Such a leadership style is commonly linked to quality of care given the articulation of organizational structures with collaboration and innovation behaviours [26].

RQ4: The awareness of knowledge management systems contributes to quality of care in several ways. While related to the presence of quality of care (Conf 1 and 2—Table 6), an awareness of knowledge management systems is also absent in certain configurations leading to the outcome (Conf 3, and 5—Table 6). Similar to the absence of ethical leadership configurations, the absence of awareness of knowledge management systems at the university hospital can still lead to the presence of quality of care if robust social networks, capable of strong social support, and ethical leaders were present. Nevertheless, healthcare workers perceive, rely on, and intrinsically acknowledge the importance of knowledge dissemination and development in their professional outcomes [53,54]. Given this evidence, it is plausible that a focus on knowledge dissemination is informally put in place at the university hospital, thus deeming this condition either absent (Conf 3, and 5—Table 6) or non-relevant for some configurations leading to the presence (Conf 4) and absence (Conf 1, and 2—Table 7) of quality of care.

RQ5: Results show five configurations leading to the presence of quality of care (Table 6). The alternative number of configurations leading to the same outcome reveals several pathways to be translated into different managerial strategies. Two configurations show circumstances where quality of care occurs when individual characteristics are present and one of the organizational characteristics is absent (Conf 4, and 5—Table 6). As such, even in circumstances where the organizational characteristics are difficult to achieve, quality of care can thrive if social support and social networks are fostered. Similarly, one configuration leading to the presence of quality of care also requires the presence of both organizational characteristics even if social support is absent (Conf 1—Table 6). Such results underpin the flexibility of conditions required to achieve quality of care. Two additional configurations (Conf 2, and 3—Table 6) show mixed scenarios, where circumstances contributing to quality of care relied on the combination of both presence and absence of individual and organizational characteristics alike. This conveys an extended framework of analysis that provides insight over possible interventions to maximize quality of care in the university hospital context. Nonetheless, the results also show that all configurations required the combination of three conditions for the presence of quality of care. Therefore, the presence of quality of care is possible to achieve under alternative pathways, but it is more demanding in terms of the number of involved conditions than the alternative pathways to achieve than its absence.

RQ6: The results show three configurations leading to the absence of quality of care (Table 7) involving fewer circumstances than the configurations that lead to quality of care (each one requires only the combination of two conditions). That is, the absence of quality of care seems easier to achieve, being less demanding in terms of the number of involved conditions. Contrary to the configurations leading to the presence of quality of care, all configurations leading to the absence of quality care involve a combination of the absences of conditions, supporting the literature review a contrario. Furthermore, results show there

are no configurations combining organizational or individual conditions alone. The three configurations leading to the absence of quality care involve mixed-based combinations of conditions. Such a mixed nature of the configurations shows that the absence of quality care is a reflex of a systems' failure; it stresses caution when considering how flexible and pervasive the absence of quality of care can be in circumstances where both individual and organizational characteristics are not assessed together.

6. Conclusions

We propose that both the individual and organizational conditions of the study contribute to the quality of care provided to patients through alternative and complex configurations that back managerial practices, personnel engagement, and measurement control of internal and external factors [56,57]. Analyzing quality of care can be a complex endeavor. As a performance measure, quality of care is related to organizational structures, processes, and outcomes that rely on interdependence to achieve safe and improved medical care [38]. Given this rationale, our findings show that there are more paths leading to quality of care than to its absence. Our results also allow us to explore and verify fsQCA characteristics: there are different configurations for both the presence and absence of quality of care (asymmetry), hinting at different strategies that can be deployed in pursuing presence and fighting the absence of quality of care. Namely, managers should make available the circumstances to ensure the combinatory alternatives in Table 6. Oppositely, they should avoid the existence of the three configurations revealed in Table 7. Such quests demand managerial decision making involving both individual and organizational level conditions. Therefore, our conclusions challenge managers to add to the quality of care delivered to patients beyond the medical (technical and resource based) support of such health service.

While there are no necessary conditions for the quality of care provided to patients, or it absence, the results show that there are combinations of conditions that are sufficient in contributing to quality of care. There are also "dark" combinations of conditions the lead to the absence of such quality care. The alternative ways to generate quality of care are more numerous than the ones resulting in the absence of such care, which is good news. Our study provides several contributions. We assess complex causal relationship between individual and organizational characteristics leading to improved quality of care, and its absence. Accordingly, we discuss and provide insight towards possible paths for improving quality of care that can be pursued. Conversely, by providing insight over the pathways that also lead to the absence of quality of care, we promote a call to action on what to avoid.

To our knowledge, no previous study addresses both the presence and absence of quality of care. By extension, complex causal interaction of individual and organizational characteristics related to quality of care, while acknowledged [2–5,38], remained unexplored so far. Our results show that, while complex, quality of care at a university hospital can be achieved under diverse circumstances. Thus, our findings lead us to conclude that the hospital should be focused on the promotion of managerial strategies that value interpersonal communication and knowledge sharing. The raining and development of leaders on ethical issues can improve the quality of care through the reinforcement and mimicry of appropriate behaviours and development of new ethical standards. Last, we recommend that additional efforts be conducted in the deployment and promotion of knowledge management frameworks in healthcare contexts, given their potential in achieving quality of care, in particular, when ethical leadership is perceived and paired with a supportive, robust social system inside the organization.

7. Limitations and Future Research

The small size of the sample ($n = 51$) is a limitation of this study, yet it is adequate for the use of a cross-sectional approach using a qualitative analysis. While we use several techniques to prevent common-method variance, specific response bias might occur. Thus,

we acknowledge that the research design limits both generalization and causality. We recognize that the study is missing additional information on the conditions that could be used to further expand our results, such as characteristics of the social networks, specificities of knowledge management mechanisms, behaviours and practices, and contrasting leadership types. However, we adopt scales from the literature to ensure robust measurement. We invite colleagues to address quality of care by using matched datasets of patient perceptions and healthcare workers' perceptions on the provided quality of care. Additionally, given the complexity of the addressed phenomena, we suggest future research endeavors that adopt multimethod or mixed-method research designs. Finally, upcoming studies should develop longitudinal analysis in order to capture the impact of hospital managerial decisions on the levels of the considered conditions and the resulting quality of care.

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Institutional Review Board Statement: The research was conducted in accordance with the Code of Conduct and Good Practice of the University of Lisbon (https://www.iseg.ulisboa.pt/aquila/getFile.do?fileId=1040075&method=getFile&_request_chec-sum_=1d20d5eb184672e05ad9630eca4ac57a49152de4, accessed on 24 November 2021) and approved by the ISEG's Ethics Committee (Approval Code: 11/2021). The surveys were conducted in such a way that participants were informed of the aim of the study and were asked to participate but also informed that they had no obligation to participate. The results were not traceable to individuals or companies after the surveys were complete, and no information on the participants was stored.

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