

## Article

# The concept of care complexity: a qualitative study

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## Significance for public health

In recent years, reference to the concept of complexity has become increasingly frequent in the management of healthcare systems. This interpretation of reality and of knowledge reflects the increasing use of a multi-disciplinary approach, in both clinical and research fields, that re-evaluates the importance of the environment and the preferences of the individual. The influence of the epistemological theory of complexity in healthcare can also be identified in discussions on the role and methods of epidemiology and public health; in breaking the walls between the exact sciences and the humanities; in the appreciation of qualitative methods of research and the Bayesian approach to biostatistics.

## Abstract

**Background:** Hospital organisations based on the level of care intensity have clearly revealed a concept, that of care complexity, which has been widely used for decades in the healthcare field. Despite its wide use, this concept is still poorly defined and it is often confused with and replaced by similar concepts such as *care intensity* or *workload*. This study aims to describe the meaning of care complexity as perceived by nurses in their day-to-day experience of hospital clinical care, rehabilitation, home care, and organisation.

**Design and methods:** Fifteen interviews were conducted with nurses belonging to clinical-care areas and to heterogeneous organisational areas. The interview was of an unstructured type. The participants were selected using a propositional methodology. Colaizzi's descriptive phenomenological method was chosen for the analysis of the interviews.

**Results:** The nurses who were interviewed predominantly perceive the definition of *care complexity* as coinciding with that of *workload*. Nevertheless, the managerial perspective does not appear to be exclusive, as from the in-depth interviews three fundamental themes emerge that are associated with the concept of care complexity: the patient, the nurse and the organisation.

**Conclusions:** The study highlights that care complexity consists of both quantitative and qualitative aspects that do not refer only to the organisational dimension. The use of the terminology employed today should be reconsidered: it appears to be inappropriate to talk of *measurement of care complexity*, as this concept also consists of qualitative – thus not entirely quantifiable – aspects referring to the person being cared for. In this sense, reference should instead be made to the evaluation of care complexity, which would also constitute a better and more complete basis for defining the nursing skills required in professional nursing practice.

## Introduction

The theory of complexity in relation to health organisations has been studied since the end of the 1990's,<sup>1-3</sup> but only more recently specifically in relation to nursing.<sup>4-6</sup> The term *care complexity* has been widely used at the international level ever since attempts were made to define and quantify the costs of illnesses and their treatment. It appears to be clear that in order to evaluate the cost of a hospital admission correctly it is necessary to know the cost drivers and in particular the resources that the patient has consumed during his or her stay in hospital. This is correlated to care complexity.<sup>7-11</sup>

The term *care complexity* has been frequently used also in the nursing profession, especially in recent years. The problem of defining care complexity in the context of nursing dates back to the middle of the last century when the first instruments were formulated for evaluating work loads (New York Method 1953, John Hopkins Method 1970, Rhys Hearn Method 1970) in order to calculate the number of nurses required for each department. Despite this, a rapid survey of the instruments for measuring care complexity shows that the multiplicity of the means designed for this purpose is also due to the fact that different meanings are ascribed to this concept and that *care complexity* is often used as a synonym for care intensity or nursing workload.

Some attempts have recently been made to define the differences between the terms and to give an unambiguous meaning to the concept of care complexity.<sup>9,12,13</sup> So far, however, the profession does not seem to have found a single and clear conceptual definition. A recent concept analysis using B. Rodgers' method concluded that,<sup>14</sup> in a scenario in which the term is used with important differences in meaning, the prevalent use of the concept of complexity in the health care field seems to refer to the quantitative measurement of aspects relevant to the health care context and to organisational variables, however pointing out that the concept often refers to other aspects that are complex in their own right: patient, nurse and organisation, in both their qualitative and quantitative forms.

The lack of clarity characterising the concept called for research that would give voice also to nurses, who use the instruments for measuring the complexity of care. What do nurses think the complexity of care is? What, in their experience is the content of the concept of complex care and what are the variables that need to be covered for any measurement?

## Objective

To describe and to understand the meaning of care complexity as perceived by nurses through their daily experience facing different situations such as hospital clinical activity, rehabilitation, home care, as well as by those who deal with organisation.

## Materials and Methods

### Sample and setting

In the period of March to September 2013, fifteen interviews were conducted with nurses belonging to the clinical-care areas and to various organisational areas (Table 1).

The participants were selected, using a propositional method, according to the following criteria: nurses belonging to the current working area for at least five years (in order to obtain evidence based on consolidated experience in the work environment), in public or private establishments or as freelancers in Italy who voluntarily took part in the research project.

The participants were recruited in different ways: one group of 7 nurses was contacted directly by the interviewers following direct acquaintance; 8 were recommended by a senior manager of the Technical and Rehabilitation Nursing Services Department as people who were particularly experienced in their field. The senior manager provided a work telephone number to enable contact to be made. After making telephone contact, the researcher sent all participants an email message containing a summary of the research protocol as well as the document for obtaining informed consent, along with a request to indicate (by email or telephone) agreement to participate in order to arrange the date, time and place for the interviews.

### Data collection

To collect the interviews, the protocol provided for the active participation – apart from the head of the study – of D.L. and A.T., PhD students in Nursing Science at the University of Aquila, and M.P., a student in the third year of the five-year degree course in Nursing Science and Obstetrics at the University of Brescia. All the interviewers were properly and uniformly trained in unstructured narrative interviewing by the research leader. The interview was of an unstructured type and consisted of a single question, namely, *What does care complexity mean in your working experience?* and of the interviewer's asking the interviewee to elaborate or provide examples, if necessary. At the end of the interview (for which no limits were set) all the participants were invited, if they thought it appropriate, to add further comments/considerations and to contact the interviewer if they deemed it necessary to communicate other thoughts.

### Data analysis

All the interviews, after written consent was obtained, were recorded and transcribed verbatim by the research leader and after the analysis of each interview, the entire transcript of the interview and its analysis were sent by email to the relevant participant in order to remind the interviewee of the precise content of the interview and to ascertain that the content of the analysis conducted by the researcher corresponded to the thoughts expressed by the participant, as recommended in the phenomenological research methodology of a descriptive type, and, in particular, as envisaged by the Colaizzi method. The data analysis method breaks down into seven steps: i) each transcription was read and reread to grasp and understand the general sense of its contents; ii) each transcription was *gone over again* to extrapolate the sentences and opinions that refer directly to the phenomenon under investigation; iii) a meaning was attributed to each significant affirmation; iv) the meanings were placed into groups of themes; v) the results obtained from the study were supplemented by an exhaustive description of the investigated phenomenon; vi) the fundamental structure of the phenomenon was described; vii) to validate the data, the researcher contacted the participants in the study again to compare the results with their experience.

## Results

Fifteen interviews were conducted. All the persons contacted accepted the invitation.

The day, time and place of the interviews were arranged to suit the needs and preferences of the individual participants. Nine interviews were held in the participant's place of work (in reserved rooms outside the hours of work) and 6 were held in the University of Brescia on the premises in which the degree in Nursing is taught. On all occasions, during the interview, only the interviewer and the participant were present.

The participants ranged in age between 28 and 61; their average age was 47. The interviews lasted between 1' 59" and 1h 4' 09".

As in the first phase of the Colaizzi method, the researcher transcribed all the recorded interviews. The method enabled not only the participants' words to be listened to a large number of times but also all the paraverbal elements (the tone of the voice, the pauses, the time over which the sentences were formed, etc.).

Through the *immersion in the data*, first all the definitions of the concept were extrapolated (summarised in Table 2) and then all the sentences that referred directly to the concept (phase 2 of the Colaizzi method). As envisaged by steps 3 and 4 of the Colaizzi method, the significant sentences spoken led to a very long list of subcategories and categories (Tables 3-5), a careful analysis of which enabled the fundamental structure of the phenomenon to be described, emphasising that some categories refer to the PATIENT, others to the NURSE and still others to the ORGANISATION.

In order to validate the data, the researcher recontacted all the participants in the study to compare the obtained results with their experience. From this the three themes emerged, although some people stressed one theme more than another.

### Theme 1 - PATIENT

The patient, often also designated as the person receiving care, the sick or the ill person, is the theme that recurs with the greatest intensity and frequency.

When the interviewees refer to the patient they indicate the complexity of the case by referring to the person's pathology, or care needs: *it was thought that it was just a haematological patient and not a patient who's reached the point of needing a transplant, initially for a few years autologous and then allogenic, I didn't do it with a precise scale but somehow I identified what was changing in the patient in the allogenic transplant, who is at greater risk from infection, with greater complications because of septic shock, with greater GvH complications*

**Table 1. Distribution of participants in this study by category.**

| N. | Category                 |
|----|--------------------------|
| 1  | Intensive                |
| 1  | Surgery/general medicine |
| 1  | Specialist surgery       |
| 3  | Specialist medicine      |
| 1  | Accident and emergency   |
| 1  | Rehabilitation           |
| 1  | Hospice                  |
| 2  | Nursing home             |
| 2  | Care at home             |
| 2  | Organisational           |

(organisation 1); operations like hernias, gallbladders, appendectomies, are emergency operations for us because the patient arrives at A&E with an acute gallbladder problem, appendicitis and you give him an emergency operation (general surgery); we have a clinical folder where we record the patient's state, whether the patient is conscious and cooperative, whether he is self-sufficient, whether he is continent, incontinent, if he moves without the aid of supports, if in a word ... he's able to feed himself, is able to move, so we already know, without knowing the patient, what he might need (accident and emergency).

Time is also part of the care complexity with regard to the patient: what could come out makes them really ... there's already the expecta-

tion ... the uncertainty that they already feel about what could often be... they're already thinking about what could happen after ... Then it gives you even more satisfaction when you see them out and about a long time after the op, fortunately they've recovered or at least for a few years they haven't had ... problems and then they're back (specialist surgery); it's very complex for us to manage and, and then ... there are the chronically ill, you're with them for life ... (specialist medicine 1).

Their psychological aspects:

Nurses refer also psychological aspects of the patients and their sub-jectivity/uniqueness: *The patient despite the treatment, etc, etc, can display this INTOLERANCE, which is not physical suffering but being fed*

**Table 2. Definitions of the concept of care complexity.**

| Category               | Definitions   |
|------------------------|---|
| Intensive care         | What we do for a given pathology; Everything that is always there that from a certain point in care changes from a person to an ill person and then to our patient (the complexity is the personalisation of care)  |
| General surgery        | Quantity of patients, pathology of patients and above all work load   |
| Specialist surgery     | All the direct care, psychological approach, interaction with the patient   |
| Specialist medicine 1  | Nursing work load Patient totally dependent, with pluripathologies/also a patient that is not so complex can be complex... very complex for them... complex for us to manage, ... something psychological   |
| Specialist medicine 2  | Resources that are deployed, which may be people, technological, therapeutic, for managing the patient; This is certainly a question of resources used that is not only physical tiredness caused by having to do so many things in a short time... it's something a bit wider ... you have all your commitment and an emotional burden and then everything that is the complexity of the treatment...; Managing the patient or the relative as a person; Quantifiable/measurable |
| Specialist medicine 3  | -   |
| Accident and emergency | Series of steps that the nurse takes to improve nursing care  |
| Rehabilitation         | When patients do not look straight at themselves because they have this type of complaint but they really do have all sorts of problems; It can increase or decrease over time  |
| Hospice                | Divided into patient, family, nursing and medical teams; There's objective complexity and perceived complexity  |
| Nursing home 1         | The complexity consists of the fact that you are interacting with people; Overall, a lot of factors are evaluated; There is objectivity and subjectivity  |
| Nursing home 2         | Work load; Daily interaction with operators, relatives and guests   |
| Care at home 1         | All the resources required to achieve the goals   |
| Care at home 2         | It's the operators' approach to the patient   |
| Organisation 1         | The situation where a person may need several different types of care; Measurability; Increased technique decreases complexity  |
| Organisation 2         | By analysing the problems it is possible to analyse what is complex compared with what isn't complex; Measurability determined by facts: reason plus intuition determined by the patient's number of care problems that can be divided between primary and secondary problems, with the staff available, we deal with the primary problems  |

**Table 3. Categories that are the basis of the PATIENT topic.**

| Category  | Subcategories   |
|---|---|
| Emotions  | Emotions, Fatigue, Relationships, Loneliness, Unsuitableness, Sentiments, Ethical dilemma (good of the patient), Empathy, Tiredness, Disappointment, Passion  |
| Competencies                                      | Performance, Relationships, Observation, Objectivity/Subjectivity, Care quality, Competencies, Training, Advice, Responsibilities, Knowledge, Inappropriacy, At a glance, Holistic evaluation, Reasoning, Culture, Listening, Replies, Decisions, Experience, Appropriacy, Technique, Independence, Ethics, Training of colleagues/students/auxiliary staff Taking on, Priorities |
| Communication                                     | Relationships, Communications, Understanding, Family, Integration, Trust, Truth, Empathy, Availability  |
| Theoretical model (comprises the nursing process) | Performance, Standardisation/personalisation, Observation, Evaluation scales, Evaluation, frequency, Interventions, Objectives, Centrality of the person, Holistic evaluation, Reasoning, Intuition, Taking on responsibility   |
| Workload  | Time per patient, Performance, LOS, Work load, Commitment, Work organisation, Bureaucracy, Consultation, Instruments and measures, Changes, Roles, Shifts, Responses, Decisions, Technique, Psychological care  |

up with LIFE, an intolerance that often occurs in the days before death ... the patient EXPRESSES their fear of death, their fear of leaving family behind, anger sometimes ... (hospice); we have patients who are already under great emotional strain when they are admitted because even... almost always even if they do not know or are not told about everything for different reasons ... what needs to be tackled with great delicacy is the fragility that they ... it's their emotional state (specialist surgery); what do you want from me, leave me here in bed, what are you taking me down for, I just want to be left here quietly in my bed to die! ... I understand the suffering, the pain of the sick person (rehabilitation); all patients are different, there's nothing perfectly obvious and what we do should always be different and perhaps that is why it is complex (intensive care); because it's not the patient who decides for him or herself, it's not true, it's absolutely not true ... What you have to remember, above all, is that it is assumed that the person wants to go to a rest home (home care 2).

## Theme 2 - NURSE

There are often emotional aspects to this: *I often find it difficult ... because ... you'd like to do more, you'd like to give them more, you'd like to look after them BETTER ... it's something that makes me sorry, it makes me sorry because for me it's so important (general surgery); Really, there's... work, there's work to do on it, also try ... not to get too involved because it then becomes a problem for us too because we have to ... we become ...it's finding the right distance because, but it gets more demanding ... On the one hand it's a source of satisfaction. It gives you satisfaction when you see them around a long time after they have made a complete recovery... that way, you feel it ... you obviously try, when you're there, you try to keep the right distance, the coolness that you*

*need because otherwise it really becomes ... a tragedy but after you see them again after a certain time ...I have a little ... well, it gets to me anyway... (specialist surgery); used to it with the children actually, I shouldn't say it, but ... (accident and emergency); I have an inner struggle (rehabilitation).*

The concept of complex care also links the theme of nursing to professional skills: *... there's a great mixture and there's not always a clear distinction between roles, skills, responsibilities ... it's not so automatic that everyone knows what to do at the lowest level because one wonders why nurses tend, where possible, to become specialised nurses and above all in certain places because there they say that skills have to differ by level in order to be able to properly nurse the patients that are there,... and professionals, but on the one hand if we go in this direction, operating conditions like the ones we're experiencing, for example recently are certainly unethical, they're going against the trends (organisation 2); I don't mean financial resources, I'm talking about instrumental and cognitive means (home care 2); another aspect that emerges from nursing activity as a part of care complexity is communication, a communication that involves the patient, the family and the care team: *care also in listening (specialist medicine 3); we always try to EXPLAIN what we are doing (accident and emergency); just as in care complexity relating to nursing, the nurses often mention the nursing process (or some of its phases), and the theoretical reference model that they use in their work has a series of diagnoses/problems that involve, as it were, diagnostic reasoning, putting together a series of data, learning to make a series of correlations, which is not as much formulating, let's say, the textbook diagnosis, but also involves intuition, the nurse who puts together all these things, well, these steps are sometimes not all there and instead you look much more at the fact that the sick person is a patient, I don't**

**Table 4. Categories that are the basis of the NURSE topic.**

| Categories              | Subcategories  |
|-------------------------|--|
| Pathology               | Pathology, instability, prevention, relapse, chronic conditions, comorbidity/pluripathology, development of the pathology, emergency, etiology, diagnosis, physical pain, criticality, complications, drug treatment, seriousness, objectivity, QOL (quality of life), LOS (length of stay) lucidity, weight of the care complexity, danger, fragility |
| Social and care needs   | Needs, QOL, prevention, multidimensionality, self-sufficiency, lucidity, weight of the care complexity, independence, collaboration, social status, education, spirituality, relationships, technology, needs priority, number of needs, fragility, entourage  |
| Time                    | LOS, time, future, instability, prevention, age, return, change, chronic conditions, development of the pathology, discharge, expectations, emergency, criticality, need priorities  |
| Psychology              | Need, QOL, emotions, behaviour, relationships, psychology, trust, spirituality, awareness, emotional pain, desires, feelings, fragility  |
| Subjectivity/uniqueness | Uniqueness, diversity, heterogeneousness, multidimensionality, subjectivity, rights, requirements, social status, expectations, self-determination, desire   |

**Table 5. Categories that are the basis of the ORGANISATION topic.**

| Categories          | Subcategories   |
|---------------------|---|
| Economics           | Professional, therapeutic, technological resources, organisational resources, numbers, efficiency, economics, services, costs                                       |
| Time                | LOS, workload, change, priorities, development, shifts  |
| Places              | Department, heterogeneity of the patients, relationships, professional resources, staffing levels, conflict, help, integration, communication, organisational model |
| Multidisciplinarity | Team, heterogeneity of the patients, relationships, professional resources, staffing levels, conflict, help, integration, communication, organisational model       |
| Bureaucracy         | Activities, bureaucracy, rules, protocols, organisational model   |



know, who is considered to have a fancy – sounding complaint, but sometimes even before, even before assessing the patient, the patient is surely going to be a patient who will keep me busy. So sometimes, even when the patient comes from A&E with a certain type of initial diagnosis so to speak, even before making specific investigations, maybe with a focused examination (organisation 2); we have to provide SERVICES (home care 2); but for nurses, part of the care complexity in their work is to do with the workloads (an aspect that is connected to the theme of organisation, which will be set out in the paragraphs below): *I could talk of a... workload, a workload that does not perhaps allow you to... give the quality of care* (nursing home 2).

### Theme 3 - ORGANISATION

There are references to financial aspects, time, multidisciplinary and bureaucracy: *We've also limited the costs, haven't we? Because that's also needed to limit resources...* (organisation 1); *care complexity is also translated at that moment into nursing services for everything connected to, let's say, reducing resources...* (organisation 2); *I have to provide services with time and minutes totalled up, so once again the way we address care complexity if your patient costs me €360, costs me roughly €400 and I have to hold their hand* (home care 2); *sometimes I realise that some things could be solved more easily and in less TIME if there were more constant assistance and well...* (hospice); *We have long waiting lists* (general surgery); *there's been an evolution in the concept of home care and above all this has come with an increase of multiprofessional figures* (home care 1); *usually as a team, we work in a team so there are health and social care workers, ancillary staff, nurses and doctors* (general surgery); *there's also team work and let's say multidisciplinary work, we act as a glue between various professionals* (specialist medicine 3); *then there is a whole series of bureaucratic complexities that are terrible, terrible, but you just have to live with it because you can't do anything about it* (general surgery).

## Discussion

As emerges from the results, in their work nurses perceive care complexity as a set of heterogeneous factors such as the person, their multidimensionality, their work tasks and the organisation in which they operate.

THE PATIENT is a complex element who has objective needs that can, on the one hand, be standardised and measured (the pathology with its features, the patient's basic needs, the pain); on the other hand, the patient is also a unique subject who goes through his or her experience in relation to his or her culture, emotions, desires, to the meaning that he or she ascribes to life, pain and death. This duality becomes clear in the definition of Care Complexity provided by the intensive care nurse: it is related to what is done when dealing with a pathology while at the same time maintaining person-centred care.

Moreover, the patient often has a family entourage (or a lack of family entourage).

The family is very frequently mentioned in the experiences of nurses as a key factor in determining care complexity.

The category of time, with reference to the patient, has a double value: the objective time that can be, for example, the length of stay (LOS) in hospital, the patient's age, the urgency of the pathology; but a time is also cited that is more linked to the person's emotions, to the change that illness brings with it, to expectations for the future, to a return due to a relapse.

The theme of the NURSE emerges from categories that are today widely debated within the profession.

As emphasised several times, the concept of care complexity is closely correlated with work load. In fact, three participants in the study use

the term *work load* to define care complexity (general surgery, specialist medicine and nursing home 2). Work loads in turn derive from subcategories originating in matters linked to nursing activities, bureaucratic activities (related to the type of organisation), to skills, and to the time made available for the patient.

Furthermore, within the theme of the nurse, there emerges strongly the category of skills which, on the one hand points up the subcategory of training, culture, knowledge and appropriateness but on the other hand is also determined by the ability to observe, reason, and listen. The contrast between objectivity and subjectivity emerges once again also within the theoretical model where standardisation even through the use of evaluation scales contrasts with personalised care.

The theme of ORGANISATION emerges from the subcategories of available resources, efficiency, costs, which are all elements that refer to the category of economics. Also times and places determine the organisation: for example, managing shifts, prioritising, but also the physical environments in which care is provided (poor layout, unsuitable rooms, distances to be covered) and all the subcategories which are aspects of bureaucracy such as set rules at all levels, protocols, organisational models, and the activities linked with them. In the organisation one has to measure oneself against other professional figures, hence there is the need to develop relational models and integration models to overcome conflicts or to help oneself within the team. It should be noted that the category of time, in all themes, takes on a different meaning but has a central role. In the theme of the person, time is what exists before the illness; it is the duration of the illness, it is uncertainty about the future, it is the possibility that a relapse will occur, it is the chronic nature of the pathology that will be with you all your life.

For the nurse, time is the enemy to be contended with, as there is always little time in the context of all that has to be done within an eight-hour shift, along with answers to provide, decisions to take, endless hospital stays. It is also true that time often brings change, and it is not always easy to adapt to change.

Then there is the time of the organisation, the time that determines priorities, the time that *ties up* patients and nurses, the time that nurses cannot change, against which they often struggle, trying to provide a rational motivation.

It is noteworthy that despite working in widely differing environments, including organisational environments, all the nurses interviewed brought the same themes into focus. Nurses working in the clinical environment also related the concept of care complexity to bureaucracy and nurses dealing with organisation made mention of patients' pathologies. We could reflect on the fact that whatever the working environment, the setting is and remains nursing and this is certainly not an element to be underestimated.

The limitation of the study is that the concept was analysed only from the point of view of the nursing profession. Although the participants in the qualitative study included two nurses who are involved in organisation (departmental coordinators), the thought reflected the nursing background. It would be interesting to pursue the topic further in future studies, examining the meaning of the concept amongst health authority directors, or amongst clinical directors and administrative directors.

## Conclusions

The fact that care complexity is linked to other complex elements inevitably leads to the theory of complex systems and, in particular, to the hierarchy of complex systems. According to such a theory, in order to thoroughly understand the operation of a complex system one should understand the operation of the lower hierarchical levels so as to be

able to make significant improvements to the complex system being studied. The relationships and interactions of these lower hierarchical levels should be studied in that they are more important than the intrinsic nature of the elements themselves.<sup>15</sup> With regard to the complexity theory, in order to further scrutinise the concept of care complexity, it would thus be necessary to study in depth the relationships between patient, nurse, work organisation, and, at the lower hierarchical levels (applying a top-down method), the relationships between (but not limited to) pathology, care and psychological needs, time and the personal uniqueness of the patient; the relationships between emotions, work load, skills, the theoretical model in the nursing profession; and between financial aspects, time, places, bureaucracy and multidisciplinary in organisations.

Therefore, in order to understand the behaviour of care complexity (but not to measure it, as the concept draws too much on qualitative elements that are, therefore, not measurable) it becomes necessary, according to complexity theory, to identify and thoroughly understand all the interactions between the different elements that emerge from the interviews with the nurses.

The study shows that care complexity comprises both quantitative and qualitative aspects. The importance of such a duality emerges in many of the interviews regarding the role of the nurse: standardisation of care or personalisation of care? Care guided by reasoning or care guided by intuition? The emphasis on objectivisation or on the subjective perception of the complexity? The presence of such a duality was already apparent in a preceding study that stressed these two attributes of the concept, of which one is connected to uncertainty and the other to measurement.<sup>16</sup>

Expertise emerged several times as a subcategory of nursing skills. In fact, if we look at the context of the care complexity (hospital organisation based on intensity of care) and we class said complexity as part of Progressive Patient Care<sup>14</sup>, it is impossible not to stress that the question of nursing skills has been considered in depth in countries in which PPC has been a well-established model for decades. It is therefore natural that by linking the concept of care complexity to the hospital model based on the intensity of care also in the Italian context, the question of nursing skills is raised. This question is moreover extremely topical.

As in previous studies,<sup>16</sup> the work clearly shows that care intensity consists both of measurable elements that can be objectivised (the type of illness and its course, the level of self-sufficiency of the person receiving care, the number of hours in a working shift, a professional's type of training, the theoretical reference model in a given operational unit, the efficacy of the care, the staffing levels of a department) and of elements that are not quantifiable and are correlated to the subjectivity of persons (fear of the future, trust, self-determination, the feelings of the patients and nurses, the *glance* that enables nurses to go beyond logic and knowledge, the cooperation within a multidisciplinary team). These latter elements lead us once again to assert that the concept of care complexity as described by this study cannot be measured or classified on any scale.

We therefore deduce that the use of the terminology adopted today should be reconsidered. It is in fact inappropriate to talk of *measuring care complexity*,<sup>17-19</sup> because the concept also comprises qualitative aspects that, as such, are not quantifiable and are not referable only to the person receiving care. Accordingly, we could instead consider measuring the complexity of the recipient of care, which would also determine the nursing skills required for the patient's care within an organisation that displays all its complexity characteristics.

It is to be hoped that further studies will identify and investigate the factors that have the greatest impact in the assessment of the complexity of patient care for a systemic approach.

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## References

1. Anderson RA, Allred CA, Sloan FA. Effect of hospital conversion on organizational decision making and service coordination. *Health Care Manage Rev* 2003;28:141-54.
2. Noll DC. Complexity theory 101. *Med Group Manage J* 1997;44:224-76.
3. Rhydderch M, Elwyn G, Marshall M, Grol R. Organisational change theory and the use of indicators in general practice. *Qual Saf Health Care* 2004;13:213-7.
4. Holden LM. Complex adaptive systems: concept analysis. *J Adv Nurs* 2005;52:651-7.
5. Paley J. Complex adaptive systems and nursing. *Nurs Inq* 2007;14:233-42.
6. Paley J. The appropriation of complexity theory in health care. *J Health Serv Res Policy* 2010;15:59-61.
7. Benedict L, Robinson K, Holder C. Clinical nurse specialist practice within the acute care for elders interdisciplinary team model. *Clinical Nurse Specialist* 2006;20:248-5
8. Goossen WTF, Epping P, Van den Heuvel WJA, et al. Development of the Nursing Minimum Data Set for the Netherlands (NMDSN): identification of categories and items. *J Adv Nurs* 2000;31:536-47.
9. Morris R, MacNeela P, Scott A, et al. Reconsidering the conceptualization of nursing workload: literature review. *J Adv Nurs* 2007;57:463.
10. O'Brien Pallas L, Irvine D, Peereboom E, Murray M. Measuring nursing workload: Understanding the variability. *Nurs Econ* 1997;15:171-82.
11. Welton JM, Unruh L, Halloran EJ. Nurse staffing, nursing intensity, staff mix, and direct nursing care costs across Massachusetts hospitals. *J Nurs Admin* 2006;36:416-25.
12. Cologna M, Zanolli D, Saiani L. Complexity of care: meanings and interpretations. *Assistenza Infermieristica E Ricerca* 2010;29:184-91.
13. Lancia L, Di Labio L, Carpico A, Petrucci C. Aspects and relevant relationship in the nursing workload conceptualization: literature review. *Prof Inferm* 2011;64:3-10.
14. Guarinoni MG, Motta PC, Petrucci C, Lancia L. Complexity of care: a concept analysis. *Ann Ig* 2014;26:226-36.
15. Morin E. From the concept of system to the paradigm of complexity. *J Soc Evol Syst* 1992;15:371-85.
16. Guarinoni MG, Motta PC, Petrucci C, Lancia L. [Progressive

- Patient Care Model and its application into hospital organization: a narrative review]. *Prof Inferm* 2013;66:205. [Article in Italian]
17. Bollini G, Colombo F. L'Intensità assistenziale e la Complessità Clinica – un progetto di ricerca della Regione Lombardia. Milano: Regione Lombardia, 2011.
  18. Cavaliere B. Sistema integrato di misurazione della complessità assistenziale. *Manag Inferm* 2006;12:13-22.
  19. Galimberti S, Rebora P, Di Mauro S, et al. The SIPI for measuring complexity in nursing care: evaluation study. *Int J Nurs Stud* 2012;49:320-6.