

“Wind of change”: the role of human centered healthcare factors in the implementation of clinical governance in an Italian University teaching hospital

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Abstract

Background. Clinical governance (CG) is an approach to quality improvement in healthcare aimed at achieving a patient-centered health care system. The main objective of this study was to highlight human centered healthcare latent factors underlying the results of a CG assessment performed in the teaching hospital “A. Gemelli” of Rome, Italy.

Materials and methods. CG implementation levels were assessed through OPTIGOV[®] (OPTimizing healthcare GOVernance), a CG scorecard methodology. In order to identify the variables generating latent factors that can influence the governance of the Hospital, the multiple correspondence analysis (MCA) was applied.

Results. The application of OPTIGOV[®] showed a good CG implementation level in the Gemelli Hospital. By applying MCA, the variables aggregated so as to define 3 latent factors (F1: assessment for people oriented improvement strategy; F2: assessment for people targeted management; F3: tracking for timely accountable people) explaining as a whole 82.68% of the total variance and respectively 48.09% (F1), 24.95% (F2) and 9.64% (F3).

Conclusions. The heuristic interpretation of the three latent factors could bring back to the concept of humanization in healthcare. This study shows that in the teaching hospital “A. Gemelli” humanization in healthcare is the driver of health care quality improvement.

Key words

- clinical governance
- humanized healthcare
- multiple correspondence analysis

INTRODUCTION

Since the late 1990s, the concept of Clinical governance (CG) has become an internationally recognized approach for the improvement of quality in healthcare, so that its principles are now of value worldwide. The different definitions given to CG have in common the attribution to healthcare professionals of a double responsibility: providing care and improving healthcare system by giving the same emphasis to quality and financial aspects [1]. The CG’s great opportunity is, therefore, to change systems by merging the different components of clinical and managerial worlds to improve healthcare quality [2], through the pursuit, besides the financial balance, of a continuous improvement of both patient care and professional practice [3,

4]. Several attempts to measure the implementation levels of CG – as a whole or in its single dimensions – or, more generally, hospital quality management systems within healthcare organizations have been made. These attempts were characterized by a substantial heterogeneity both in terms of methodological rigor and scope [5]. One of these approaches is OPTIGOV[®] (Optimizing Health Care Governance), a methodology developed in 2006 by the Department of Public Health of the Università Cattolica del Sacro Cuore, teaching hospital “A. Gemelli”, Rome, Italy. OPTIGOV[®] has been applied within several Italian hospitals, resulting in a realistic representation of the effective CG implementation degree. In 2013 the OPTIGOV[®] analysis was carried out within the teaching hospital “A. Gemelli”,

by highlighting strengths and weaknesses of the organization and resulting in a plan for improvement [1].

In a framework characterized by a plenty of heterogeneous tools aimed at assessing CG, it would be very challenging for healthcare providers to recognize – through the use of these instruments – the presence inside the organization, beside the CG core elements, also of latent elements underling a potential of humanization, thus including attention both to patient centered care and healthcare professionals' quality working life. Patient centered care has been defined by Institute of Medicine (IOM)'s Quality Chasm report as care that is "respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions" [6]. According to Courtney M *et al.* quality working life (QWL) can be defined as the state of the art of practices aimed at the development of programs attempting to modify existing organization structures, systems and management processes by involving employees in decision making processes that lead to enhanced organizational performance and greater employee satisfaction [7]. Managers can and must work on both patient centeredness and quality working life by calibrating their strategic vision. Reaching this objective requires a growing attention to human person, both patient and healthcare worker, aimed to realize a human-centered healthcare system. The last should combine clinical excellence and patient's satisfaction based on the perception of high standards of care [8, 9]. However, to our knowledge, none of the available approaches to CG assessment have been used on the one hand to search for a strategic vision, on the other to assess the degree of healthcare humanization.

Therefore the aim of this study has been to characterize the findings of the OPTIGOV® evaluation through a likely dichotomy between the "status quo ante" assessment of the teaching hospital "A. Gemelli" and a human centered healthcare latent strategic vision. The last has been inferred by the multiple correspondence analysis (MCA), thus providing a further interpretation of the OPTIGOV® results, in order to identify strategic levels for the improvement of the whole Hospital.

MATERIAL AND METHODS

OPTIGOV®

A cross-sectional study had been previously performed, by applying the OPTIGOV® methodology [1] within the teaching hospital "A. Gemelli" between July and December 2012. CG had been evaluated in 47 hospital wards (24 surgical and 23 medical wards) and 10 clinical directorates. The CG areas analyzed had been: evidence based medicine (EBM), accountability, clinical audit, risk management, performance evaluation, patient involvement, which definitions are reported in Table 1. These areas had been assessed through hospital audits, supported by an evidence-based weighted questionnaire – the OPTIGOV® Scorecard – which has been previously described in detail [1]. OPTIGOV® is a methodology aimed at assessing the CG implementation level within a healthcare organization by assigning an overall CG score and partial scores referred to the single CG areas. The questionnaire used for the audit/assessment is divided into different areas of analysis and for each area there is a form with a variable number of questions and "closed" answers, 179 questions as a whole. A score is assigned to each answer so that all the answers total up to a maximum global score of 100 for each area of analysis (min = 0 – max = 100) [1].

Statistical analysis

In order to identify the variables generating latent factors (composite indicators) influencing hospital governance, MCA [10] was applied to the findings of the cross-sectional study previously performed in the teaching hospital "A. Gemelli" by applying the OPTIGOV® methodology (see above). Data to be analyzed by MCA were extracted from a database resulting from the findings of the last, and the study did not involve human subjects. Therefore, the approval of the ethics committee was not required. For the same reason (*i.e.* there were not human subjects involved in the study), we performed an evaluation not related to sex/gender or other patient characteristics, so we did not provide a sex/gender analysis.

MCA is a particular technique of factor analysis, that has been chosen for flexibility and applicability, allow-

Table 1

Clinical governance (CG) areas investigated by OPTIGOV®

CG areas	Definition
Evidence based medicine (EBM)	The practice of medicine based on the integration of clinical experience with the best available scientific proofs applied to each patient's unique features and values.
Accountability	The availability within the organization of univocal systems of identification of those responsible for clinical activities (doctors, nurses and other health professionals).
Clinical audit	The structured and systematic peer review process, aimed at systematically examine one's own activity and results by comparing them with explicit standards, with the purpose of improving healthcare quality and outcomes.
Performance evaluation	The ability of healthcare organization to systematically monitor the results of clinical practice in terms of efficacy, suitability, efficiency, quality and time.
Risk management	The techniques and methods to manage risk, the existence of insurance coverage, the identification of risks, the procedures to prevent risks and medical errors.
Patient involvement	The structured and systematic discussion and dialogue with the patient/citizen about clinical decisions taken in healthcare wards.

Table 2
Clinical governance (CG) global and partial scores

	Mean	SD	Min	Max	95% CI
Clinical governance	48.84	14.25	27.99	85.59	43.63-51.84
EBM	49.00	13.21	15.48	85.71	44.62-52.24
Accountability	59.03	19.37	28.57	100.00	58.03-63.87
Clinical audit	36.50	29.41	3.77	97.80	25.96-42.38
Performance evaluation	60.00	18.67	18.75	100.00	53.47-63.89
Risk management	26.53	26.08	00.00	100.00	18.12-32.69
Patient involvement	51.97	14.57	29.41	94.12	57.11-65.50

SD: standard deviation; CI: confidence interval.

ing to analyze the pattern of relationship of several categorical dependent variables. A preliminary descriptive analysis was carried out to sort different answer modalities to each OPTIGOV® question, by putting them in the same order, from positive to negative modalities (*i.e.* from “yes always” to “no, never”). By applying MCA, variables were reduced into composite indicators and factorial axes were identified.

The interpretation of the axes is based upon the categories contributions.

In order to correct the likely underestimated explained inertia (variance), the Benzecri formula was applied. Each composite indicator was arbitrarily named according to the interpretation of the included variables (all the variables contributing to generate that specific latent factor) [10].

The French SPAD Package Software 5.0 was used to perform the analysis.

RESULTS

A CG global score and 6 partial scores (overall hospital average scores) referred to the above mentioned CG areas were obtained by applying the OPTIGOV® Scorecard [1]. The results of this evaluation according to OPTIGOV®'s are shown in *Table 2*.

By applying the MCA among the clinical directorates, the variables clustered so as to define three dimensions (latent factors), which explained as a whole 82.68% of total inertia. Each dimension explained a percentage of total inertia amounting to respectively: 48.09% (dimension 1), 24.95% (dimension 2) and 9.64% (dimension 3) (*Table 3*).

By analyzing each dimension and its related variables, the following interpretations were heuristically derived:

Dimension 1: focus on both healthcare professionals and patients by providing evidence and feedback about clinical performance and safety in order to identify strategies and continues long-term improvement actions;

Dimension 2: focus on both healthcare professionals and patients through performance assessment aimed to middle-term planning and monitoring in order to improve healthcare quality by empowering healthcare professionals awareness;

Dimension 3: impact on healthcare quality by timely improving communication and cooperation among healthcare professionals and doctor-patient relationship and enhancing safety for both healthcare workers and patients.

On the basis on these interpretations the dimensions were respectively named as:

Table 3
Factors sets of the three main dimensions (variables relatives contribution)

Dimensions	Dimension 1 Assessment for people Oriented improvement Strategy	Dimension 2 Assessment for People targeted Management	Dimension 3 Tracking for Timely Accountable People
Inertia	48.09%	24.95%	9.64%
Variables	Performance evaluation of nurses (No 1.9; Yes 5.4)	Clinical audit activities (No 4.6; Sometimes 0.5; Always 6.0)	Accountability for nurses (No 5.7; Sometimes 11.0; Always 1.2)
	Performance evaluation and clinical outcome (No 1.8; Yes 2.6)	Performance evaluation measurement results and improvement of health care activity (No 6.7; Sometimes 5.9; Always 0.5)	Incidence reporting system (No 2.3; Yes 5.2)
	Performance assessment and feedback process (No 5.2; Sometimes 1.0; Always 7.5)	Performance evaluation and clinical output (No 9.7; Yes 3.4)	
	Benchmarking about medical error prevention (No 1.0; Yes 4.2)		

Dimension 1: “Assessment for people oriented improvement strategy”;

Dimension 2: “Assessment for people targeted management”;

Dimension 3: “Tracking for timely accountable people”.

Regarding the first and the second factors (*Figure 1* – Assessment for people targeted management and assessment for people oriented improvement strategy) the variables “Clinical output are not evaluated” (PerfEval & Output NO), “Performance assessment does not trigger some feedback process” (Eval & FB NO), “Measurement results are not used in order to improve health care activity” (PerfEval & Improve NO), “Clinical audit is sometimes performed within the wards” (ClinAud ST) were in the bottom left quadrant, indicating a basic attention to performance assessment but a moderate propensity to the peer review process. The variables “Performance assessment sometimes triggers some feedback process” (Eval & FB ST), “Measurement results are sometimes used in order to improve health care activity” (PerfEval & Improve ST), “Clinical outcomes are not evaluated” (PerfEval & Outcome NO), “Clinical audit is not performed within the wards” (ClinAud NO) were in the top left quadrant, indicating a still marginal leaning toward strategic perspective (As-

essment for people oriented improvement strategy). At the same time the variables “Clinical outcomes are evaluated” (PerfEval & Outcome YES), “Measurement results are always used in order to improve health care activity” (PerfEval & Improve ALW), “Performance assessment always triggers some feedback process” (Eval & FB ALW), “Clinical audit is always performed within the wards” (ClinAud ALW) and “There is some benchmarking about risk management” (MedErrPrev & Bench YES) were in the bottom right quadrant, signifying a good tension to assessment practices implementation aimed at healthcare organization managing (Assessment for people targeted management) and a moderate assessment for strategy. The variable “Clinical output are evaluated” (PerfEval & Output YES) was in the top right quadrant, showing a notable attention to performance assessment.

About the first and the third factors (*Figure 2* – Assessment for people oriented improvement strategy and Tracking for timely accountable people), the variables “Performance assessment does not trigger any feedback process” (Eval & FB NO), “Nurses and technical personnel performances are not assessed” (PerfEval & Nurse NO), “Nurses are sometimes accountable” (NurseAcc ST) and “There isn’t an incident reporting system” (MedErrPrev NO) were in the bottom left

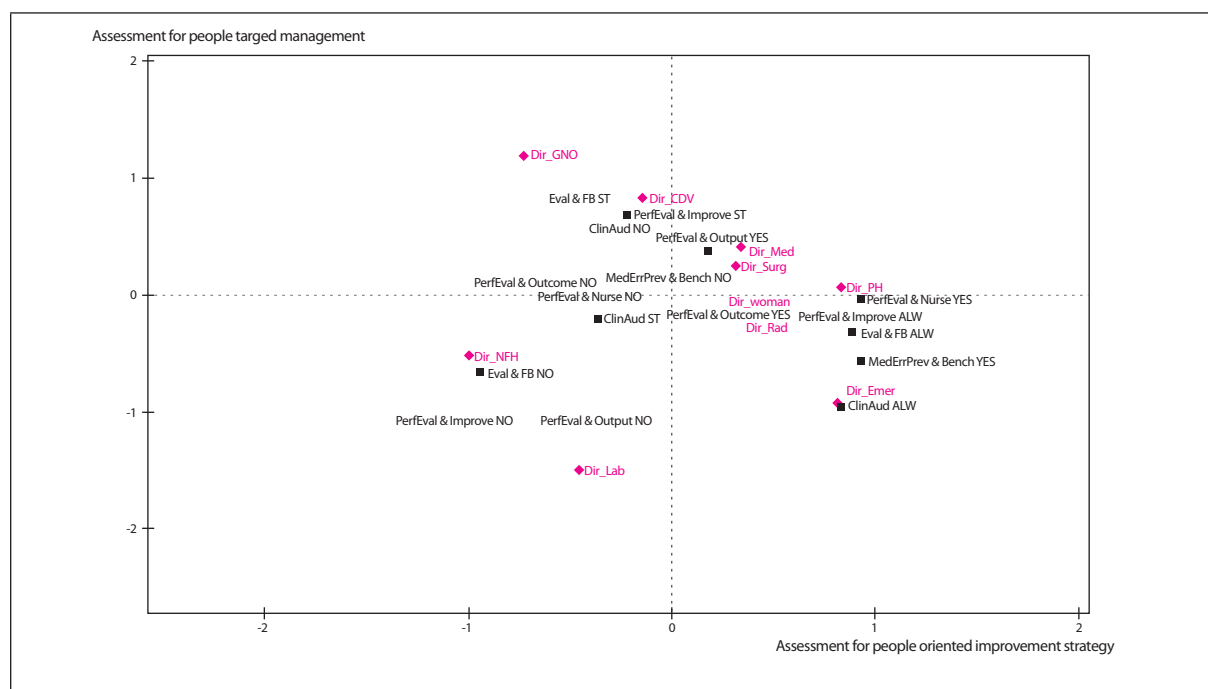


Figure 1

Assessment for people targeted management and assessment for people oriented improvement strategy.

Dir_Surg: Directorate of Surgical Sciences; Dir_PH: Directorate of Public Health; Dir_woman: Directorate of Woman Health; Dir_Emer: Directorate of Emergency; Dir_Lab: Directorate of Laboratory Medicine; Dir_Rad: Directorate of Radiological Sciences; Dir_NFH: Directorate of Surgery for Head, Face and Neck; Dir_Med: Directorate of Medical Sciences; Dir_CDV: Directorate of Cardiovascular Diseases; Dir_GNO: Directorate of Geriatric, Orthopedic and Neurological Sciences; PerfEval & Output YES: Clinical output are evaluated; PerfEval & Output NO: Clinical output are not evaluated; PerfEval & Outcome YES: Clinical outcomes are evaluated; PerfEval & Outcome NO: Clinical outcomes are not evaluated; PerfEval & Improve ALW: Measurement results are always used in order to improve health care activity; PerfEval & Improve ST: Measurement results are sometimes used in order to improve health care activity; PerfEval & Improve NO: Measurement results are not used in order to improve health care activity; PerfEval & Nurse YES: Nurses and technical personnel performances are assessed; PerfEval & Nurse NO: Nurses and technical personnel performances are not assessed; MedErrPrev & Bench YES: There is some benchmarking about risk management; MedErrPrev & Bench NO: There is any benchmarking about medical error prevention; Eval & FB ALW: Performance assessment always triggers some feedback process; Eval & FB ST: Performance assessment sometimes triggers some feedback process; Eval & FB NO: Performance assessment doesn't trigger some feedback process; ClinAud ALW: Clinical audit is always performed within the wards; ClinAud ST: Clinical audit is sometimes performed within the wards; ClinAud NO: Clinical audit is not performed within the wards.

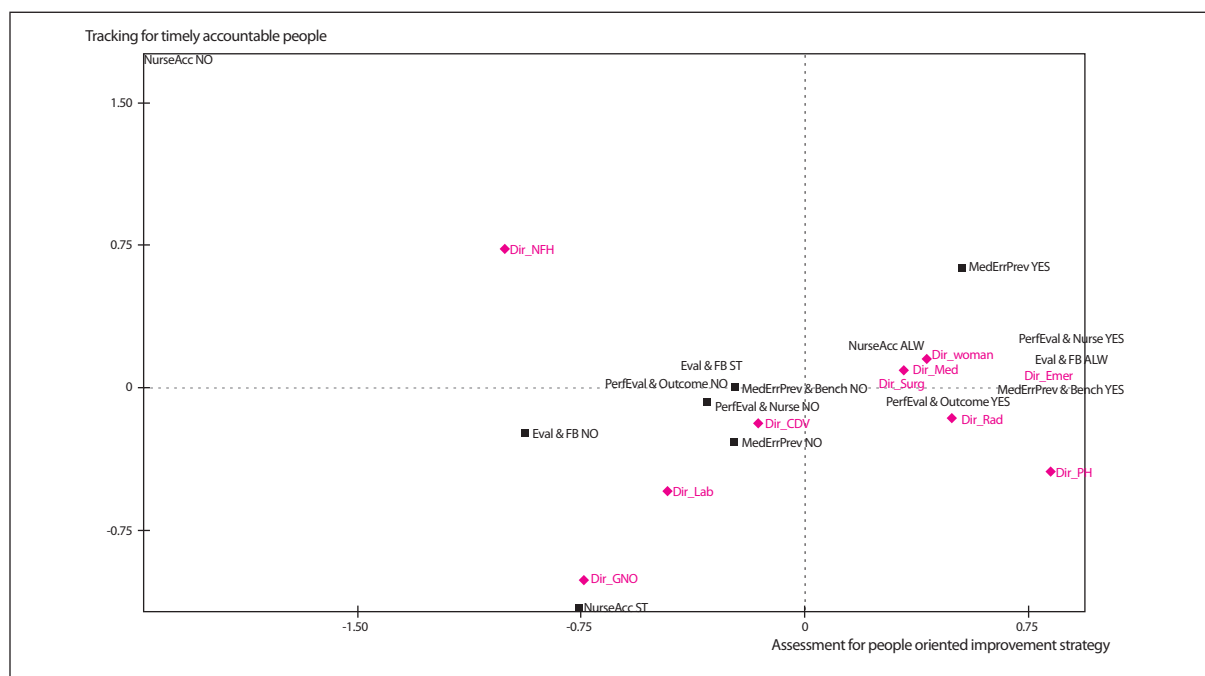


Figure 2
Assessment for people oriented improvement strategy and tracking for timely accountable people.

Dir_Surg: Directorate of Surgical Sciences; Dir_PH: Directorate of Public Health; Dir_woman: Directorate of Woman Health; Dir_Emer: Directorate of Emergency; Dir_Lab: Directorate of Laboratory Medicine; Dir_Rad: Directorate of Radiological Sciences; Dir_NFH: Directorate of Surgery for Head, Face and Neck; Dir_Med: Directorate of Medical Sciences; Dir_CDV: Directorate of Cardiovascular Diseases; Dir_GNO: Directorate of Geriatric, Ortopedic and Neurological Sciences; PerfEval & Nurse YES: Nurses and technical personnel performances are assessed; PerfEval & Nurse NO: Nurses and technical personnel performances are not assessed; PerfEval & Outcome YES: Clinical outcomes are evaluated; PerfEval & Outcome NO: Clinical outcomes are not evaluated; MedErrPrev & Bench YES: There is some benchmarking about risk management; MedErrPrev & Bench NO: There is not benchmarking about risk management; NurseAcc ALW: Nurses are always accountable; NurseAcc ST: Nurses are sometimes accountable; NurseAcc NO: Nurses are not accountable; Eval & FB ALW: Performance assessment always triggers some feedback process; Eval & FB ST: Performance assessment sometimes triggers some feedback process; Eval & FB NO: Performance assessment does not trigger any feedback process; MedErrPrev NO: There is not an incident reporting system.

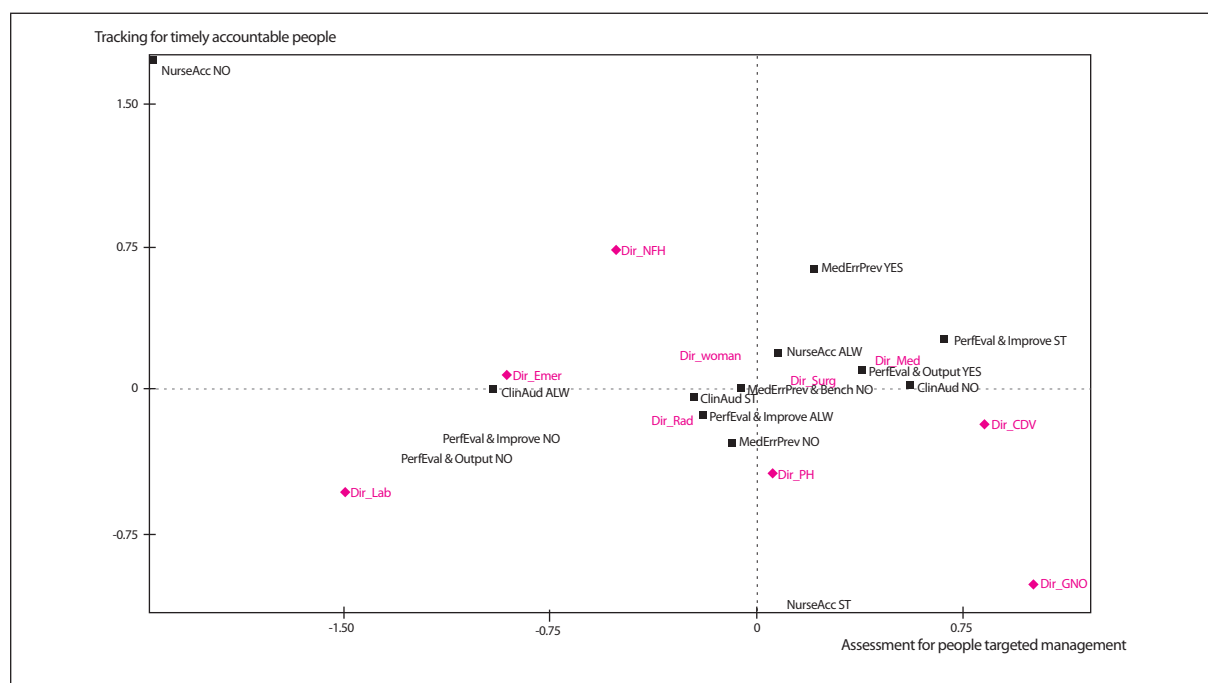
quadrant, indicating a likely lack of assessment for strategy but conversely a moderate attention to track clinical activities (Tracking for timely accountable people). The variables "Performance assessment sometimes triggers some feedback process" (Eval & FB ST) and "Nurses are not accountable" (NurseAcc NO), both placed in the top left quadrant, and "There is some benchmarking about risk management" (MedErrPrev & Bench YES) and "Clinical outcome are not evaluated" (PerfEval & Outcome YES), in the bottom right quadrant, indicate respectively a low-moderate and a good attention to assessment for strategy. The variables "Nurses are always accountable" (NurseAcc ALW), "Nurses and technical personnel performances are assessed" (PerfEval & Nurse YES), "There is an incident reporting system" (MedErrPrev YES) and "Performance assessment always triggers some feedback process" (Eval & FB ALW) were in the top right quadrant, signifying a very good tracking and assessment for strategy.

Concerning the second and the third factors (Figure 3 – Assessment for people targeted management and Tracking for timely accountable people), the variables "Measurement results are not used in order to improve health care activity" (PerfEval & Improve NO), "Clinical output are not evaluated" (PerfEval & Output NO), "There is not an incident reporting system" (MedErrPrev NO) and "Clinical audit is sometimes performed within the wards" (ClinAud ST) were in the

bottom left quadrant likely showing a lack of tracking and a limited assessment for management. The variable "Nurses are not accountable" (NurseAcc NO) was in the top left quadrant, showing a lack of tracking. At the same time, the variable "Nurses are sometimes accountable" (NurseAcc ST) was in the bottom right quadrant, suggesting a partial tracking. Finally, the variables "Nurses are always accountable" (NurseAcc ALW), "There is an incident reporting system" (MedErrPrev YES), "Measurement results are sometimes used in order to improve health care activity" (PerfEval & Improve ST), "Clinical audit is not performed within the wards" (ClinAud NO) and "Clinical output are evaluated" (PerfEval & Output YES) were in the top right quadrant, signifying a good tracking and an adequate assessment for management.

DISCUSSION

The main objective of this study was to highlight human centered healthcare latent factors underlying the results of a CG assessment performed in an Italian teaching hospital by applying the OPTIGOV® methodology. MCA used to this purpose allowed the identification of three dimensions: "Assessment for people oriented improvement strategy", "Assessment for people targeted management", "Tracking for timely accountable people", which explained as a whole more than 82% of total inertia.

**Figure 3**

Assessment for people targeted management and tracking for timely accountable people.

Dir_Surg: Directorate of Surgical Sciences; Dir_PH: Directorate of Public Health; Dir_woman: Directorate of Woman Health; Dir_Emer: Directorate of Emergency; Dir_Lab: Directorate of Laboratory Medicine; Dir_Rad: Directorate of Radiological Sciences; Dir_NFH: Directorate of Surgery for Head, Face and Neck; Dir_Med: Directorate of Medical Sciences; Dir_CDV: Directorate of Cardiovascular Diseases; Dir_GNO: Directorate of Geriatric, Ortopedic and Neurological Sciences; PerfEval & Improve ALW: Measurement results are always used in order to improve health care activity; PerfEval & Improve NO: Measurement results are not used in order to improve health care activity; PerfEval & Output YES: Clinical output are evaluated; PerfEval & Output NO: Clinical output are not evaluated; NurseAcc ALW: Nurses are always accountable; NurseAcc ST: Nurses are sometimes accountable; NurseAcc NO: Nurses are not accountable; ClinAud ALW: Clinical audit is always performed within the wards; ClinAud ST: Clinical audit is sometimes performed within the wards; ClinAud NO: Clinical audit is not performed within the wards; MedErrPrev YES: There is an incident reporting system; MedErrPrev NO: There is not an incident reporting system.

Our study adds new findings on the role of human centeredness (*e.g.*, patient centeredness care and quality working life) as a successful key in CG assessment, necessary to gain a continuous quality improvement in a large teaching hospital.

Such a role was highlighted through the application of MCA analysis, which confirmed its prerogative to supply health services research with innovative perspectives and analysis tools taken from social sciences [11].

Concerning the above-mentioned dimensions, the first latent factor, “Assessment for people oriented improvement strategy”, was extrapolated according to a perspective dimension and the afferent variables (“nurses and technical personnel performances are assessed”, “clinical outcomes are evaluated”, “performance assessment always trigger feedback process”, “there is benchmarking about medical error prevention”) show a capacity building and continuous improvement attitude derived from strategic assessment. It should be possible to describe this latent factor as a long-term dimension. The second latent factor, defined as “assessment for people targeted management”, can be considered a middle-term dimension. It resumes (from its afferent variables: “clinical audit is always performed within the wards”, “the measurement results are used in order to improve health care activity”, “clinical output are evaluated”) the possibility of improvement for the Institution starting from a personal empowerment and culture de-

velopment, learning from errors and assessing performance for a better value healthcare [12].

The last factor, “tracking for timely accountable people” (“nurses are accountable” and “there is an incident reporting system”), synthesizes the concept of accountability focused on “people for people” building a more people-targeted environment aimed to give trust to the healthcare professionals giving trust to the patients and to give trust to the patients giving trust to healthcare professionals which clinical decisions should be guided by patient values [6].

This study shows some limits and also some strengths. Among limits there is a reductive evaluation of inertia explained by factorial axes which has been obviated by the Benzecri formula [10]. At the same time the heuristic interpretation of results could be considered as a subjective interpretation. Notwithstanding, considering that MCA has been applied to CG implementation levels previously assessed with a evidence-based CG scorecard (OPTIGOV®) [1], it is reasonable to conclude that the three factors identified can be effectively referred as CG “constituents”. Moreover, by setting a variance cut-off point of 60% [13], these results can be assumed to be more than satisfactory given their robustness. Furthermore, among strengths we can consider the joint analysis of different variables, the opportunity for the researcher to express his own sensibility and also his ability in interpreting measures which – although unre-

lated to a probabilistic logic – can lead him to analytical choices. Finally, MCA can be considered the crossroads of epistemological, theoretical, methodological, technical and applicative way of science interpreting [14].

We performed our analysis on a catholic university teaching hospital whose legal and moral responsibility is to focus on the person, not only the patient but also the healthcare professional, so to explain – through the dimensions derived by the MCA as human centered healthcare latent factors – that a good level of CG responsiveness can contribute to build a humanized healthcare environment.

The heuristic interpretation subtended to the definition of the above-mentioned three dimensions could bring back to the concept of humanization in healthcare. In fact, to ensure quality and sustainability of their activities, healthcare systems should adopt a human-centered model [8], which is a particular application of user-centered design [15, 16] and should be committed for both patient centeredness and quality working life [6, 7], which are a strong drivers of continuous quality improvement [5, 7].

Conversely, in time, healthcare practice has been focusing on the disease rather than on the patient, sacrificing its empathic component on behalf of care delivered, technological complexity, financial logic and making necessary its rediscovery.

Ethics requires the implementation of a reflective process concerning the principles, values, rights and duties guiding healthcare practice, the latter including the dimension of care from a humanized perspective.

Thus, the findings of this study lead to reflect on ethical considerations upon which humanization actions must be grounded, highlighting the importance of a human dimension in professional relations [17].

Finally, it is possible reading a coherent link between the findings of this study and the mission of the Università Cattolica del Sacro Cuore institution.

According to the teaching hospital “A. Gemelli” strategic

plan 2012-2016, in order to pursue the Polyclinic primary mission, a person focused healthcare is now more than ever needed, where healthcare, training, research and catholic culture become an “unicum”, the cornerstone for the intellectual and ethic empowerment of the person, both patient and healthcare professional. This was the first aim of Agostino Gemelli, the Università Cattolica founder, for its hospital: to create a “locus amoenus” where it is possible to take care of the patient, of the person, of the spirit [18].

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Conflicts of interest statement

The authors declare that they have no competing interests.

Authors' contributions

MLS: conceived of the study, participated in its design and drafted the manuscript.

AGdB: participated in its design and drafted the manuscript.

PP: participated in its design, performed the statistical analysis and drafted the manuscript.

MA: performed the statistical analysis and drafted the manuscript.

WR: conceived of the study and participated in its coordination.

GD: conceived of the study, participated in its design and in its coordination.

All authors have read and approved the final manuscript.

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