Italian Journal of Medicine 2014; volume 8:238-245

pagepress

The nurse-physician collaboration: a survey among Internal Medical Units in Liguria region

Roberta Rapetti,[1] Barbara Fiorini,[2] Matteo Puntoni,[3] Andrea DeCensi,[2] Giuliano Lo Pinto[2]

[1]San Paolo Hospital, Savona; [2]Medical Department, Galliera Hospital, Genoa; [3]Office of the Scientific Director, Galliera Hospital, Genoa, Italy

ABSTRACT

The nurse-physician relationship is undergoing profound changes after the introduction of the degree in nursing sciences. We conducted a survey among 18 Internal Medicine Units in Liguria region to investigate the real picture of this collaboration, using the Jefferson collaboration scale (JCS) and the nurse-physician collaboration scale (NPCS). We sent anonymous questionnaires to 580 nurses and 180 physicians of whom over 50% responded. Of 15 items of JCS and 27 of NPCS, 9 (60%) and 13 (48.1%) did not show different opinions between nurses and physicians, respectively. However, significant differences were observed on several items, including the caring process, the nurse autonomy, the physician authority and the human relationship. On the question: *The primary function of the nurse is to carry out the physician's orders*, 23% of the nurses and 33% of physicians agreed, whereas only 46% of the nurses and 22% of the physicians strongly disagreed (P<0.001). Our study demonstrates the desire of nurses and physicians to cooperate, although some differences are still evident and require plans of improvement.

Introduction

To assist derives from the Late Latin term *ad-sistere* which means *to be close to the patients needs*. The nurse-physician collaboration affects the quality of care.[1-6] The educational system in our country has undergone profound changes in recent years with the introduction of the degree in nursing sciences, which has abolished the concept of job description. This change, which has equated the role of the two health professionals, has altered the traditional scheme with the physician focusing his/her attention on the clinical case knowledge and the nurse taking care of the person knowledge and patient needs.

Several aspects still threaten this change, including the distinct role of the two health professional categories in the society, some relevant income differences, gender prejudices, power and hierarchy, even though the number of women in the medical profession has dramatically increased in the last ten years. Moreover there is a lack of an adequate educational training in medical school regarding the concept and practice of team work.

Martin *et al.*[2] have recently reviewed 14 studies on the impact of the nurse-physician collaboration on the clinical outcome of hospitalized patients, indicating a better outcome where the nurse-physician collaboration was adopted. Also Tschannen *et al.* demonstrated a reduction of the length of stay in Hospital where such a collaboration was implemented.[3]

Several authors (reviewed by Cypress[7]) have addressed the nurse-physician collaboration since 1986 using the concept analysis developed by Rodgers.[8] These papers have shown the influence of nurse-physician communication on patient's safety and clinical outcomes. The Royal College of Physicians and the Royal College of Nursing have recently defined the principles of best practice stating the crucial importance of team work and effective communication in the *Ward rounds in medicine*.[9]

Correspondence: Giuliano Lo Pinto, Medicina Interna, EO Ospedali Galliera di Genova, Mura delle Cappuccine 14, 16121 Genova, Italy.
Tel.: +39.320.4309403 - Fax: +39.010.57481355.
E-mail: giuliano.lo.pinto@galliera.it

Key words: physician-nurse relations, nurse's role, physician's role, outcome assessment, health care.

Contributions: RR, GLP, conception and design, data collection and management; RR, BF, MP, ADC, GLP, data interpretation and manuscript writing; MP, statistical analysis.

Conflict of interests: the authors declare no potential conflicts of interest.

Support: supported by Federation of Associations of Hospital Doctors on Internal Medicine Liguria region (FADOI Liguria).

Received for publication: 21 October 2013.
Revision received: 22 November 2013.
Accepted for publication: 25 November 2013.

This work is licensed under a Creative Commons Attribution NonCommercial 3.0 License (CC BY-NC 3.0).

©Copyright R. Rapetti et al., 2014
Licensee PAGEPress, Italy

Italian Journal of Medicine 2014; 8:238-245
doi:10.4081/itjm.2014.439

Non-commercial use only

OPEN ACCESS

We conducted a survey on the nurse-physician relationship among all Medical Units of the Ligurian Hospitals, a region covering nearly 1.5 million inhabitants in Northwest Italy.

The aim of the study was to investigate the real life nurse-physician collaboration in these Medical Units.

Materials and Methods

We selected two validated questionnaires which cover complementary aspects of the collaboration, the Jefferson collaboration scale (JCS)[10,11] and the nurse-physician collaboration scale (NPCS).[12] All Medical Units of the Liguria region and all tenured nurses and physician working in these units were eligible.

The JCS was adopted in USA by Hojat *et al.* since 1985.[10] It comprises four categories: sharing some aspects of the professional education; the caring process; the nurse autonomy; and the physician authority. The JCS includes 15 items on a Likert scale (from 1 to 4) with the highest score meaning the greatest degree of collaboration.

The NPCS was developed in Japan by Ushiro *et al.* in 2009.[12] It measures the actual collaborative behavior between nurse and physician based on a self-reported assessment. NPCS is divided into three categories, including the sharing of the clinical patient information; the decision-making process; the nurse-physician cooperation.

The scale includes 27 items on a Likert scale (from 5 to 1) with the lowest score meaning the greatest degree of collaboration. Both questionnaires were translated in Italian using the *back translation* method to ensure an accurate reporting of the original meaning.[13]

The questionnaires were sent to the physicians and nurses heads of each unit and were filled on paper and returned by courier to the coordinating center at Galliera Hospital in Genoa, and the data were collected on a computer data base.

The study was approved by the Institutional Review Board of the coordinating institution, the Galliera Hospital, Genoa, in 2011. All participants signed a written informed consent.

Statistical methods

The main descriptive statistics used for continuous variables were mean, standard deviation, median, minimum and maximum; for discrete variables (gender and the answers to the questionnaires) were absolute frequency and relative frequency. Independent sample t-test was used to compare mean age between the two categories of professionals (nurses and physicians) while Pearson chi-square or Fisher's exact test (in case of 2x2 tables) were used between categorical variables (*e.g.*, frequency of response to each question between nurses and physicians). Nonparametric Kruskal-Wallis test for comparison of medians was used for continuous variables into categories such as age. Graphical representations of responses were made by bar charts and box-plots. In all tests the threshold for statistical significance was a two-tailed α-error of 5% with no correction for multiplicity.

The software used for statistical analyses is STATA (Release 13; StataCorp., College Station, TX, USA).

Results

We sent anonymous questionnaires to the 18 units of Internal Medicine composed by 580 nurses and 180 physicians. A total 311 nurses responded for JCS (53.6%) and 299 for NPCS (51.5%), whereas 97 physicians responded for JCS (53.8%) and 88 for NPCS (48.8%). Two Units did not adhere to the study.

The main subject characteristics of the study population are summarized in Table 1. As expected the vast majority of the nurses (88%) were women, whereas the physicians were equally distributed between genders. The median age was 42 years among nurses and 50 years among physicians.

Non-commercial Use only

Table 1. Main subjects characteristics.

	Physicians	Nurses	P*
JCS responders (N=408)	**N=97**	**N=311**	
Gender°, n (%)			
Males	45 (48.9)	35 (12.1)	<0.001
Females	47 (51.1)	254 (87.9)	
Age, years (median, min-max)	50 (34-65)	42 (23-62)	<0.001
NPCS responders (N=387)	**N=88**	**N=299**	
Gender°, n (%)			
Males	39 (45.9)	37 (12.7)	<0.001
Females	46 (54.1)	254 (87.3)	
Age, years (median, min-max)	50 (33-83)	42 (23-62)	<0.001

JCS, Jefferson collaboration scale; NPCS, nurse-physician collaboration scale. *Pearson chi-square or independent samples *t*-test; °missing data for 27 (JCS) and 11 (NCPS) responders.

Of a total of 15 items of JCS, 9 (60%) did not show a significant difference of opinions between nurses and physicians. Four items of JCS were selected based on the greatest difference of opinions between nurses and physicians. The overall results of JCS are shown in Table 2. The most striking results are illustrated in Figure 1.

Specifically, on question 9 of JCS: *Physicians and nurses should contribute to decisions regarding the hospital discharge of patients*, a total of 81% of the nurses agreed (strongly or tended to agree) in contrast to only 28% among physicians (P<0.005).

On question 10 of JCS: *The primary function of the nurse is to carry out the physician's orders*, a total of 23% of the nurses and 33% of physicians agreed (strongly or tended to agree), whereas only 46% of the nurses and 22% of the physicians strongly disagreed (P<0.001).

On question 12 of JCS *Nurses should also have responsibility for monitoring the effects of medical treatment*, a total of 87% of the nurses and only 28% of the physicians agreed (P<0.01).

On question 14 of JCS *Physician should be educated to establish collaborative relationships with nurses*, a total of 96% of the nurses and only 28% of the physicians agreed (P<0.001).

Table 2. Responses to the Jefferson collaboration scale questionnaire by physicians and nurses.

		Strongly disagree		Tend to disagree		Tend to agree		Strongly agree		
Question	**Responder**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**P**
A nurse should be viewed as a collaborator and colleague with a physician rather than his or her assistant (Q1)	Physicians	4	4.1	14	14.4	31	32.0	48	49.5	<0.001
	Nurses	7	2.3	21	6.8	55	17.8	226	73.1	
Nurses are qualified to assess and respond to psychological aspects of patient's needs (Q2)	Physicians	4	4.1	16	16.5	41	42.3	36	37.1	<0.001
	Nurses	4	1.3	12	3.9	90	28.9	205	65.9	
During their education, medical and nursing stud. Should be involved in teamwork in order to understand their respective roles (Q3)	Physicians	5	5.2	8	8.2	22	22.7	62	63.9	<0.001
	Nurses	3	1.0	6	1.9	46	14.8	256	82.3	
Nurses should be involved in making policy decision affecting their working conditions (Q4)	Physicians	2	2.1	8	8.2	23	23.7	64	66.0	<0.001
	Nurses	1	0.3	4	1.3	29	9.3	277	89.1	
Nurses should be accountable to patients for the nursing care they provide (Q5)	Physicians	3	3.1	2	2.1	8	8.2	84	86.6	0.4
	Nurses	4	1.3	7	2.3	39	12.6	259	83.8	
There are many overlapping areas of responsibility between physicians and nurses (Q6)	Physicians	6	6.3	16	16.8	44	46.3	29	30.5	0.7
	Nurses	20	6.5	44	14.2	130	41.9	116	37.4	
Nurses have special expertise in patient education and psychological counseling (Q7)	Physicians	5	5.3	17	17.9	46	48.4	27	28.4	<0.001
	Nurses	16	5.1	17	5.5	117	37.6	161	51.8	
Physicians should be the dominant authority in all health care matters (Q8)	Physicians	34	35.1	35	36.1	20	20.6	8	8.2	0.06
	Nurses	152	48.9	100	32.2	38	12.2	21	6.8	
Physicians and nurses should contribute to decisions regarding the hospital discharge of patients (Q9)	Physicians	11	11.5	17	17.7	42	43.8	26	27.1	0.008
	Nurses	20	6.4	38	12.2	110	35.4	143	46.0	
The primary function of the nurse is to carry out the physician's orders (Q10)	Physicians	21	22.1	42	44.2	24	25.3	8	8.4	0.001
	Nurses	139	45.1	100	32.5	51	16.6	18	5.8	
Nurses should be involved in making policy decisions concerning the hospital support services upon which their work depends (Q11)	Physicians	3	3.1	12	12.5	36	37.5	45	46.9	<0.001
	Nurses	4	1.3	8	2.6	65	21.0	232	75.1	
Nurses should also have responsibility for monitoring the effects of medical treatment (Q12)	Physicians	7	7.3	11	11.5	44	45.8	34	35.4	0.014
	Nurses	6	1.9	36	11.6	117	37.7	151	48.7	
Nurses should clarify a physician's order when they feel that it might have the potential for detrimental effects on the patient (Q13)	Physicians	8	8.3	4	4.2	17	17.7	67	69.8	<0.001
	Nurses	4	1.3	3	1.0	42	13.5	261	84.2	
Physicians should be educated to establish collaborative relationships with nurses (Q14)	Physicians	7	7.3	12	12.5	32	33.3	45	46.9	<0.001
	Nurses	8	2.6	8	2.6	54	17.4	240	77.4	
Interprofessional relationships between physicians and nurses should be included in their educational programs (Q15)	Physicians	15	15.6	20	20.8	33	34.4	28	29.2	0.03
	Nurses	23	7.5	36	11.7	108	35.2	140	45.6	

Q, question.

Non-commercial use only

Of a total of 27 items of NPCS, 13 (48.1%) did not show a significant difference of opinions between nurses and physicians. The overall results of NPCS are shown in Table 3. We selected 4 items based on the greatest difference of opinions between nurses and physicians. The most striking results are illustrated in Figure 2.

Specifically, on question 7 of NPCS: *The nurses and the physicians have the same understanding of the future direction of the patient's care*, a total of 27% of the nurses and 6% of the physicians stated it never happens (P<0.001).

On question 8 of NPCS: *In the event a patient develops unexpected side effects or complications, the nurses and the physicians discuss countermeasures*, a total of 14% of nurses *vs* 1% of physicians stated it never happens (P<0.001).

On question 23 of NPCS: *The nurses and the physicians can freely exchange information or opinions about matters related to work*, a total of 13% of the nurses and 33% of the physicians stated it always happens, whereas 8% of the nurses and only 1% of the physicians stated it never happens (P<0.001).

On question 24 of NPCS: *The nurses and the physicians show concern for each other when they are very tired*, a total of 10% of the nurses and 20% of the physicians stated it always happens, whereas 20% of the nurses and 5% of the physicians stated it never happens (P<0.001).

Discussion

We assessed the nurse-physician collaboration in 16 of 18 Internal Medicine Units of the Liguria region through two validated questionnaires exploring different aspects. While JCS is related to the ideal perception of the collaboration, NPCS records opinions among health professionals regarding its real application in everyday practice.

Overall the results demonstrate a high perception of the importance of the nurse-physician collaboration, but in some items which concern the caring process, the nurse autonomy, the physician authority and even the human relationship the opinions differ dramatically between the two groups.

Noticeably, JCS item 10 demonstrated that still a third of the physicians consider nurses as pure executors of their orders, but even more remarkably, nearly one quarter of the nurses agree with this organization. As expected, the relationship with age was borderline significant for physicians, *i.e.*, older physicians more strongly agreed with this statement (Figure 3). This observation suggests that while the nurses autonomy is recognized by law, still an important proportion of the nurses are not ready to take this responsibility. Likewise, a significant proportion of physicians are not ready to accept the new nurse's role. In line with these findings, question 12 on the shared responsibility for monitoring the effects of

Non-commercial use only

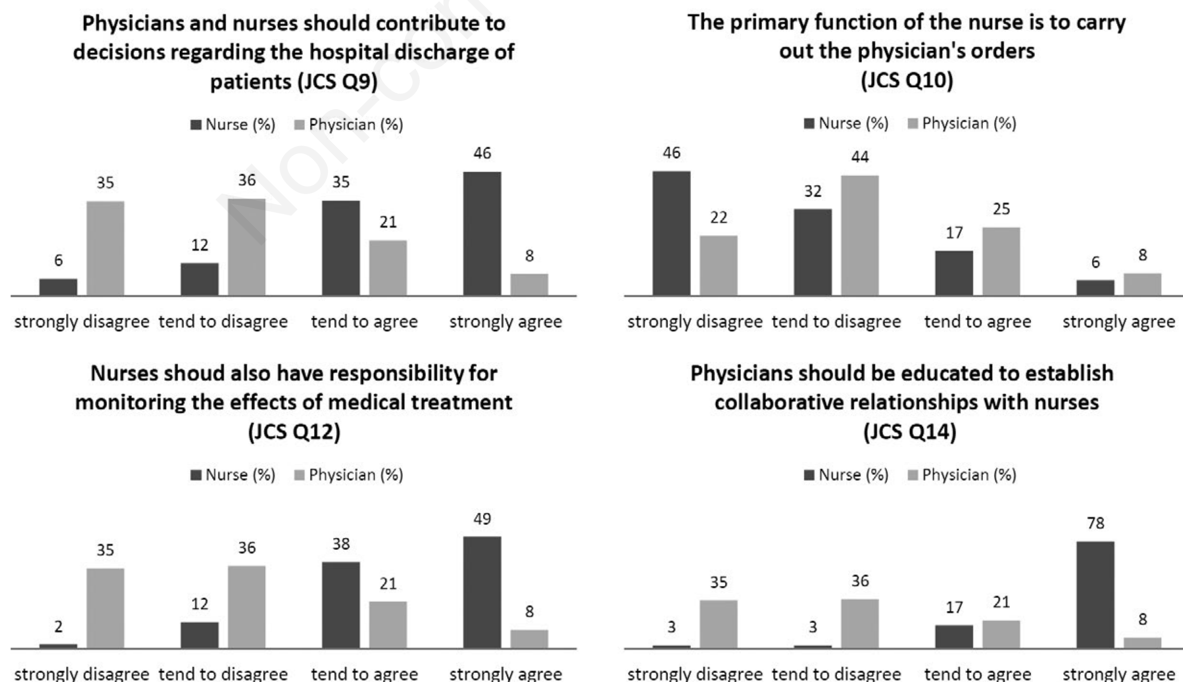

Figure 1. Histograms of Jefferson collaboration scale (JCS) question (Q) 9, Q10, Q12 and Q14. The differences between nurse and physician responses were significant at P<0.005, P<0.001, P<0.01 and P<0.001 respectively.

Table 3. Responses to the nurse-physician collaboration scale questionnaire by physicians and nurses.

Question	Responder	Always		Usually		Sometimes		Rarely		Never		
		No.	%	No.	%	No.	%	No.	%	No.	%	P
The nurses and the physicians exchange opinions to resolve problems related to patient cure/care (Q1)	Physicians	16	18.2	35	39.8	23	26.1	12	13.6	2	2.3	0.003
	Nurses	28	9.4	86	28.8	90	30.1	56	18.7	39	13.0	
In the event of a disagreement about the future direction of a patient's care, the nurses and the physicians hold discussion to resolve differences of opinion (Q2)	Physicians	9	10.2	19	21.6	32	36.4	20	22.7	8	9.1	0.01
	Nurses	18	6.0	49	16.4	80	26.8	77	25.8	75	25.1	
The nurses and the physicians discuss whether to continue a certain treatment when that treatment is not having the expected effect (Q3)	Physicians	8	9.1	16	18.2	27	30.7	25	28.4	12	13.6	0.04
	Nurses	21	7.0	43	14.4	64	21.5	82	27.5	88	29.5	
When a patient is to be discharged from the hospital, the nurses and the physician discuss where the patient will continue to be treated and the lifestyle regimen the patient needs to follow (Q4)	Physicians	14	15.9	17	19.3	17	19.3	29	33.0	11	12.5	0.03
	Nurses	26	8.7	55	18.4	53	17.7	82	27.4	83	27.8	
When confronted by a difficult patient, the nurses and the physicians discuss how to handle the situation (Q5)	Physicians	17	19.3	30	34.1	23	26.1	14	15.9	4	4.5	0.002
	Nurses	31	10.4	69	23.1	81	27.1	64	21.4	54	18.1	
The nurses and the physicians discuss the problems a patient has (Q6)	Physicians	16	18.2	35	39.8	21	23.9	15	17.0	1	1.1	0.01
	Nurses	31	10.4	94	31.6	74	24.9	64	21.5	34	11.4	
The nurses and the physicians have the same understanding of the future direction of the patient's care (Q7)	Physicians	6	6.8	18	20.5	30	34.1	29	33.0	5	5.7	0.001
	Nurses	24	8.1	40	13.5	74	24.9	79	26.6	80	26.9	
In the event a patient develops unexpected side effects or complications the nurses and the physicians discuss countermeasures (Q8)	Physicians	12	13.6	30	34.1	26	29.5	19	21.6	1	1.1	0.001
	Nurses	56	18.7	73	24.4	56	18.7	70	23.4	44	14.7	
In the event a patient no longer trusts a staff member, the nurses and the physicians try to respond to the patient in a consistent manner to resolve the situation (Q9)	Physicians	11	12.5	29	33.0	22	25.0	17	19.3	9	10.2	0.8
	Nurses	38	12.8	87	29.2	68	22.8	58	19.5	47	15.8	
The future direction of a patient's care is based on a mutual exchange of opinions between the nurses and the physicians (Q10)	Physicians	10	11.4	19	21.6	34	38.6	18	20.5	7	8.0	0.02
	Nurses	32	10.7	59	19.7	74	24.7	71	23.7	63	21.1	
The nurses and the physicians seek agreement on signs that a patient can be discharged (Q11)	Physicians	9	10.3	15	17.2	20	23.0	26	29.9	17	19.5	0.01
	Nurses	27	9.0	28	9.4	57	19.1	69	23.1	118	39.5	
The nurses and the physicians discuss how to prevent medical care accidents (Q12)	Physicians	8	9.1	27	30.7	26	29.5	22	25.0	5	5.7	0.05
	Nurses	20	7.0	57	20.0	80	28.1	82	28.8	46	16.1	
The nurses and the physicians all know what has been explained to a patient about his/her condition or treatment (Q13)	Physicians	9	10.2	28	31.8	21	23.9	22	25.0	8	9.1	0.5
	Nurses	30	10.6	75	26.4	77	27.1	59	20.8	43	15.1	
The nurses and the physicians share information to verify the effects of treatment (Q14)	Physicians	6	6.9	26	29.9	35	40.2	14	16.1	6	6.9	0.07
	Nurses	32	11.3	76	26.9	78	27.6	54	19.1	43	15.2	
The nurses and the physicians have the same understanding of the future direction of the patient's care (Q15)	Physicians	3	3.4	29	33.0	28	31.8	21	23.9	7	8.0	0.06
	Nurses	17	6.0	55	19.3	92	32.3	80	28.1	41	14.4	
The nurses and the physicians identify the key person in a patient's life (Q16)	Physicians	17	19.5	31	35.6	14	16.1	18	20.7	7	8.0	0.07
	Nurses	32	11.2	90	31.6	75	26.3	50	17.5	38	13.3	
In the event of a change in treatment plan, the nurses and the physicians have a mutual understanding of the reason for the change (Q17)	Physicians	3	3.4	33	37.5	30	34.1	16	18.2	6	6.8	0.06
	Nurses	11	3.9	73	25.8	82	29.0	77	27.2	40	14.1	

To be continued on next page

Non-commercial use only

OPEN ACCESS

Table 3. Continued from previous page.

		Always		Usually		Sometimes		Rarely		Never		
Question	Responder	No.	%	No.	%	No.	%	No.	%	No.	%	P
The nurses and the physicians check with each other concerning whether a patient has any signs of side effects or complications (Q18)	Physicians	6	6.8	29	33.0	34	38.6	16	18.2	3	3.4	0.02
	Nurses	46	16.1	84	29.5	75	26.3	52	18.2	28	9.8	
The nurses and the physicians share information about a patient's reaction to explanations of his/her disease status and treatment methods (Q19)	Physicians	6	6.8	22	25.0	39	44.3	17	19.3	4	4.5	0.04
	Nurses	28	9.9	71	25.0	86	30.3	59	20.8	40	14.1	
The nurses, the physicians, and the patient have the same understanding of the patient's wish for cure and care (Q20)	Physicians	5	5.7	37	42.5	27	31.0	17	19.5	1	1.1	0.004
	Nurses	22	7.8	79	28.0	80	28.4	61	21.6	40	14.2	
The nurses and the physicians share information about a patient's level of independence in regard to activities of daily living (Q21)	Physicians	13	14.8	36	40.9	27	30.7	12	13.6	0	0.0	0.02
	Nurses	35	12.4	93	33.0	76	27.0	50	17.7	28	9.9	
The nurses and the physicians can easily talk about topics other than topic related to work (Q22)	Physicians	17	19.3	33	37.5	23	26.1	12	13.6	3	3.4	0.2
	Nurses	44	15.7	92	32.7	67	23.8	48	17.1	30	10.7	
The nurses and the physicians can freely exchange information or opinions about matters related to work (Q23)	Physicians	29	33.0	26	29.5	17	19.3	15	17.0	1	1.1	<0.001
	Nurses	36	12.7	90	31.8	80	28.3	53	18.7	24	8.5	
The nurses and the physicians show concern for each other when they are very tired (Q24)	Physicians	18	20.5	32	36.4	18	20.5	15	17.0	5	5.7	<0.001
	Nurses	28	9.9	59	20.9	77	27.3	63	22.3	55	19.5	
The nurses and the physicians help each other (Q25)	Physicians	22	25.0	38	43.2	19	21.6	7	8.0	2	2.3	<0.001
	Nurses	31	11.0	70	24.8	81	28.7	52	18.4	48	17.0	
The nurses and the physicians greet each other every day (Q26)	Physicians	57	64.8	13	14.8	2	2.3	7	8.0	9	10.2	0.2
	Nurses	171	60.6	57	20.2	17	6.0	22	7.8	15	5.3	
The nurses and the physicians take into account each other's schedule when making plans to treat a patient together (Q27)	Physicians	8	9.1	29	33.0	32	36.4	14	15.9	5	5.7	0.02
	Nurses	25	8.9	68	24.3	76	27.1	59	21.1	52	18.6	

Q, question.

Non-commercial use only

medical treatment, only 28% of the physicians agreed in contrast to 87% of the nurses.

As regards NPCS, the differences in opinions on the actual collaboration become even more marked. Specifically, regarding the same understanding of the future direction on the patient's care the vast majority of the physicians believe it is common practice, whereas more than a quarter of nurses feel the opposite.

Regarding the human relationship both groups give a negative judgment since only a up to 10% of the nurses and 20% of the physicians believe they can be supported each other when they are tired, but up to 20% of the nurses feel they can never have support by the physician.

The strengths of our study are the ability to collect information from the vast majority of the Internal Medicine Units of Liguria region and the high response rate with over 50% of the professionals filling the questionnaires. One study limitation is the lack of validation of these instruments in the Italian population of health professionals notwithstanding the use of the back translation. In addition, we did not have a detailed information regarding physician specialty and nurses specialization which prevented us to conduct subgroups analysis.

The implications of our study are the following: i) the need for common teaching programs between nurses and physicians during university education; ii) the implementation of daily briefing and de-briefing in the ward; iii) periodical audits to verify the improvements; iv) use of evaluation tools of individual professionals and implementation of outcome research methods.[14]

Conclusions

The results of this survey demonstrate the desire of nurses and physicians to cooperate sharing knowl-

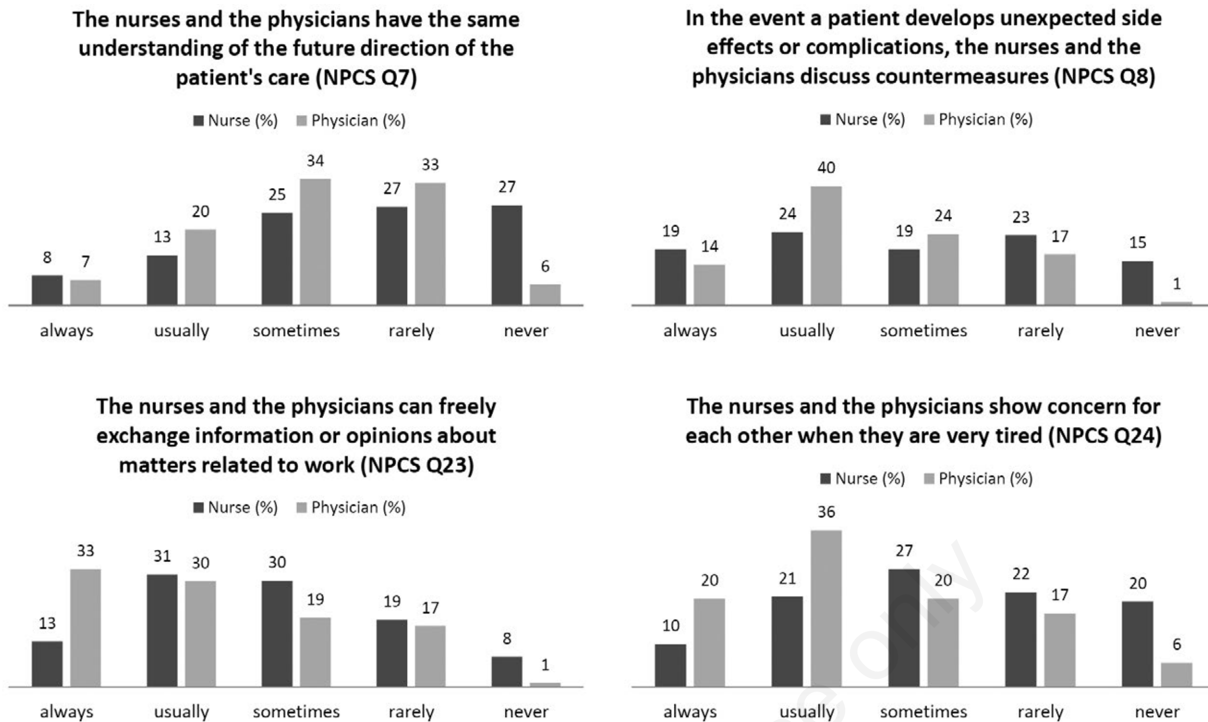

Figure 2. Histograms of nurse-physician collaboration scale (NPCS) question (Q) 7, Q8, Q23 and Q24. The differences between nurse and physician responses were all significant at P<0.001.

Non-commercial use only

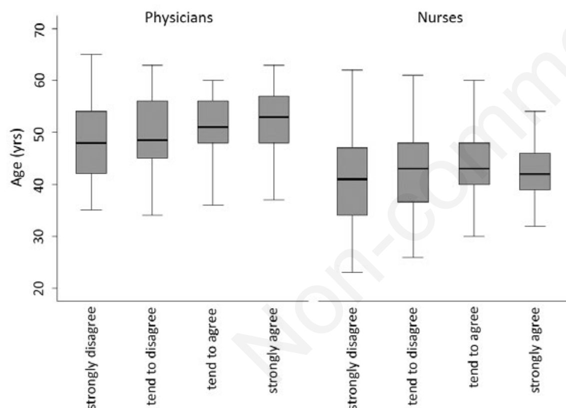

Figure 3. Age distribution (box-plot) by categories of response to Jefferson collaboration scale question (Q) 10 (*The primary function of the nurse is to carry out the physician's orders*) in physicians and nurses (P for trend =0.09 and 0.14, respectively).

edge and duties, yet maintaining each own role. Some differences are still evident in the caring process, the nurse autonomy, the physician authority and the human relationship require a number of plans of improvement, including education oriented to communication, team work, clinical outcome assessment and evaluation of each professional skills and results.

References

1. Tourangeau AE, Doran DM, McGillis Hall L, et al. Impact of hospital nursing care on 30-day mortality for acute medical patients. J Adv Nurs 2007;57:32-44.
2. Martin JS, Ummenhofer W, Manser T, et al. Interprofessional collaboration among nurses and physicians: making a difference in patient outcome. Swiss Med Wkly 2010;140.
3. Tschannen D, Kalish BJ. The impact of nurse/physician collaboration on patient length of stay. J Nurs Manag 2009;17:796-803.
4. Kalish BJ, Tschannen D, Lee KH. Do staffing levels predict missed nursing care? Int J Qual Health C 2011;23:1-7.
5. Crawford CL, Omery A, Seago JA. The challenges of nurse-physician communication. J Nurs Admin 2012;42:548-50.
6. Doran DM. Nursing-sensitive outcomes. State of the science. Burlington, MA: Jones and Bartlett Publ.; 2003.
7. Cypress BS. Exploring the concept of nurse-physician communication within the context of health care outcomes using the evolutionary method of concept analysis. Dimens Crit Care Nurs 2011;30:28-38.
8. Rodgers B. Concept analysis: an evolutionary view. In: Rodgers B, Krafl K, eds. Concept development in nursing foundations, techniques and applications. Oxford: WB Saunders; 2000. pp 77-101.
9. Royal College of Physician, Royal College of Nursing. Ward rounds in medicine: principles for best practice. London: Royal College of Physician; 2012.

10. Hojat M, Herman MW. Developing an instrument to measure attitudes toward nurses: preliminary psychometric findings. Psychol Rep 1985;56:571-9.
11. Hojat M, Fields S, Veloskj J, et al. Psychometric properties of an attitude scale measuring physician nurse collaboration. Eval Health Prof 1999;22:208-20.
12. Ushiro R. Nurse-physician collaboration scale: development and psychometric testing. J Adv Nurs 2009;65: 1497-508.
13. Guillemin F, Bombardier C, Beaton D. Cross-cultural adaptation of health-related quality of life measures: literature review and proposed guidelines. J Clin Epidemiol 1993;46:1417-32.
14. Porter ME. What is value in health care? N Engl J Med 2010;363:2477-81.

APPENDIX
List of collaborators

Martini Franco, Parodi Franca (*Sanremo, IM*), Rizzi Guido, Laura Massimiliano, Binaggia Rosanna (*Imperia*), Artom Alberto, Mela Donatella, Pizzignac Maria Antonietta, Monzani Nicoletta (*Pietra Ligure, SV*), De Franceschi Teresiano, Leonardi Rosanna (*Albenga, SV*), Tassara Rodolfo, Brignone Marcello, Saccone Annamaria, Consiglio Onorina, Parodi Lionello, Acierno Nicoletta, Civalleri Monica (*Savona*), Di Pede Egidio, Piana Simonetta (*Cairo Montenotte, SV*), Filippi Ugo, Castellaneta Marco, Terreni Danila (*Ospedale Evangelico Internazionale, Genova*), Venzano Carlo, Gallo Cassarino Marisa (*Sestri Ponente, GE*), Zavarise GianMaria, Serra Orietta (*Villa Scassi, Genova Sampierdarena*), Antonucci Giancarlo, Rapino Vincenzo, Taddeo Francesca, Obinu Enrico, Puppo Carmela (*EO Ospedali Galliera, Genova*), Franceschini Roberto, Pareti Giulia (*Rapallo, GE*), Haupt Enrico, Gandolfo Marzia (*Lavagna, GE*), Scudeletti Marco, Peri Marina (*Sestri Levante, GE*), Orlandini Francesco, La Regina Micaela, Nardini Michela (*La Spezia*), Berisso Giovanni, Giacchero Aurora, Lagomarsini Catia (*Sarzana, SP*).

Non-commercial use only