

Careggi Re-Engineered Discharge project: standardize discharge and improve care coordination between healthcare professionals

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Abstract

Background: The hospital discharge process plays a key role in patient care. Careggi Re-Engineered Discharge (CaRED) aimed at establishing a meaningful relationship among general practitioners (GPs) and patients, throughout the discharge process.

Objective: The aim is to describe the activities and results in the period 2014–17 of the CaRED.

Methods: CaRED is a restructured discharge protocol, which foresees a different, more direct form of communication between hospital and GPs, enabled by an ad hoc electronic medical record. The 30-day hospital readmission rate and/or accesses to the emergency department were evaluated as proxy for effective communication. A pre–post survey was launched to assess the GPs' perceived quality, and patient and family satisfaction.

Results: A total of 1549 hospitalizations were included, respectively, 717 in the pre and 832 in the post-intervention period. The 30-day hospital readmission rate decreased significantly in the post-intervention period (14.4% vs. 19.4%, $\chi^2(1) = 8.03$, $P < 0.05$).

Eighty-two and 52 GPs participated, respectively, in the pre- and post-survey. In the post-phase the percentage of GPs declaring the discharge letter facilitated the communication on the admission causes ($\chi^2(1) = 0.56$, $P = 0.03$) and on what to do if conditions change ($\chi^2(31) = 19.0$, $P < 0.01$) significantly increased, as well as the perception of an easier contact with the hospitalist ($\chi^2(3) = 19.6$, $P < 0.01$).

Two-hundred-eighty and 282 patients were enrolled in the pre- and post-survey. The level of understanding of key parts of the discharge letter (reason for hospitalization, post-discharge therapy, follow-up examinations and how to contact the hospital ward) improved significantly ($P < 0.01$).

Conclusions: CaRED significantly improved the discharge process and became a benchmark for local improvements in communication patterns with GPs.

Key words: quality improvement, informational continuity of care, discharge process, interdisciplinary communication

Background

The hospital discharge process is a component of patient care and safety. An effective discharge process is based on a direct communication between patient and physician and an effective information exchange between hospital and primary care.

Effective face-to-face communication between patients and healthcare staff have been shown to improve patients' safety [1]: it seems that patients who report to have been involved by clinical staff in a meaningful communication were less likely to be readmitted [2].

The discharge letter is a key element in information exchange between physicians, although it is generally poorly available (12–34%) at the first visit post-discharge [3]: it establishes direct contact between the hospital and the general practitioner (GP), providing information on the patient's hospitalization.

Early readmissions have been associated with the quality of the hospital care process, since they are generally associated with unfavourable outcomes and financial costs [4–6].

The influence of organizational factors [7, 8] has become a matter of extensive research: almost one patient in five was

exposed to an adverse event during the transition from hospital to home [9, 10]. Poor communication between the hospital medical staff and either the patient or the GP was one of the main system factors accounting for most preventable adverse events [9].

Causes of readmissions are multidimensional and vary by hospitals and healthcare organizations. Nevertheless, insufficient care coordination impacts on patient flow, resource use and post-discharge outcomes. In fact, patients lacking timely primary care follow-up are 10 times more likely to be readmitted [11]. Moreover, the proportion of all readmissions assessed as preventable varies from 9% to 59% [12]. Care coordination is a mitigating factor for reducing hospital readmissions. Increased communication skills may improve the continuity of care, considered as integration, coordination and the sharing of information between different providers [8, 13].

Sharing information with GPs has been associated with lower hospital readmission rates. Other activities with similar results are in-hospital strategies to improve patient discharge experience, medication reconciliation, follow-up appointments and improved communication related to discharge summary [7].

In 2013, a research group at the Boston University Medical Center gave birth to the Re-Engineered Discharge (RED) project, where they analysed the effects of the US discharge process and edited a checklist aimed to standardize it [14].

Similarly, the CaRED project (Careggi Re-Engineered Discharge) originates from the need of hospital healthcare workers of Careggi Teaching Hospital (a tertiary referral hospital in Florence, Italy) to establish a transparent relationship with GPs and patients, so as to warrant an effective and satisfactory discharge process. CaRED started in 2014, and it is still ongoing. In this paper we describe the activities and results between 2014 and 2017.

Methods

The CaRED project has been introduced and experimented for the first time in Italy in one internal medicine ward of Careggi Teaching Hospital and in six Florentine primary care urban districts.

The aim of the project is to assess the impact of a new, discharge protocol and communication between hospital and GPs. Its effectiveness has been assessed in terms of reduction of readmissions and improvement in the perceived quality of hospital care by the GPs and patients' satisfaction.

Setting

The CaRED project involved a High Complexity Care Medicine ward (HCCMw) (40 beds and 10 doctors) and 168 GPs. This HCCMw usually performs 2000 hospital admissions per year with a mean length of stay of 6.8 days. All the 168 GPs (It is to note that in Italy, as in other European Union countries, GPs are self-employed professionals affiliated with the National Healthcare Service by means of a national conventional agreement. CaRED aims to create a bridge between hospital and primary care, improving information continuity and integration between these settings.) operating in the six primary care urban districts around Careggi Teaching Hospital (364 665 inhabitants) were invited to participate on a

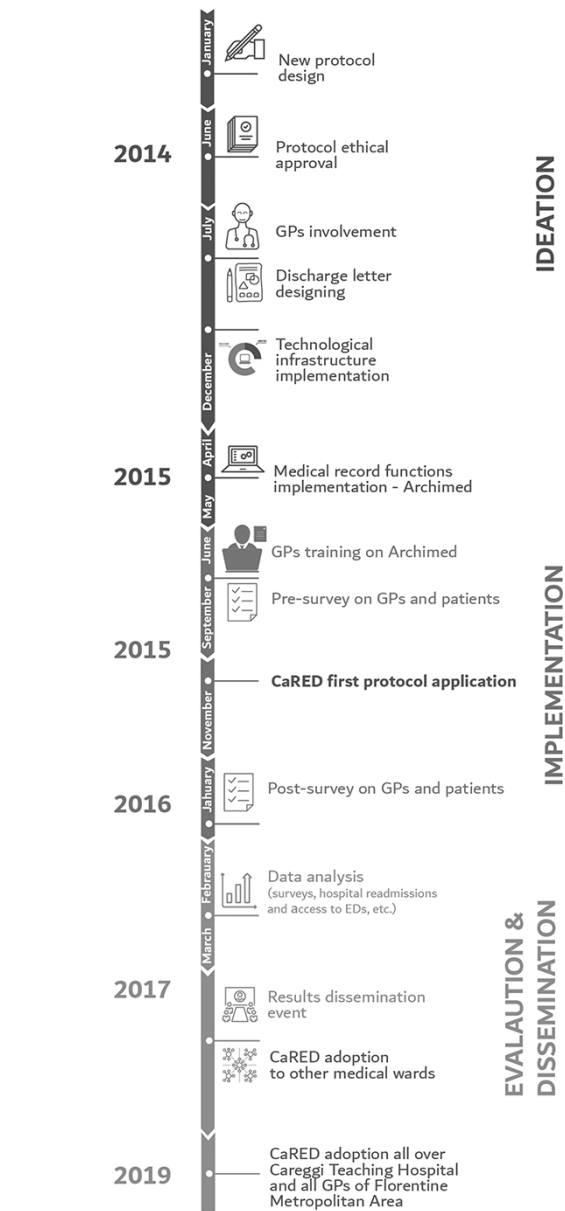


Figure 1 Timeline of the implementation of the new protocol.

voluntary basis. Patients assisted by those GPs represent 85% of admissions to the HCCMw.

Project timeline

The new protocol began in 2014, and all the activities required 3 years to be realized. The project foresaw three main phases: ideation, implementation, and assessment and dissemination (Figure 1).

The new discharge protocol

A new communication protocol between hospital doctors and GPs was developed to facilitate the handover and a safer transition from hospital to home. Patients at admission were invited to provide and signed a written informed consent (Since 1 January 2004 the Italian Personal Data Protection Code established the national rules relating to the protection of personal data, comprising those referred to a person's

health. On May 2016, with the new General Data Protection Regulation, the same data protection rules are valid on the whole territory of EU.), which allowed the hospital doctors to contact their GPs. According to the new protocol, GPs received an e-mail informing that one of their patients was hospitalized and authorized the GP to access ArchiMed, the teaching hospital electronic health record (EHR) developed in 2009 in-house by one of Careggi doctors, throughout all hospitalization. The GPs had also a chat available to directly contact and discuss health data and healthcare decisions with hospital staff. Moreover, at discharge, GPs received an e-mail alerting them and directly accessed the discharge letter.

For what concerned the discharge letter, from July 2014 till the end of the year a redesign visualization process was put in place. The new discharge letter layout was co-designed by the GPs and hospital doctors, to improve comprehensibility, readability, information completeness and handover clarity.

The discharge letter reported therapy (hour, dose and part of the day to administer), examination results, follow-up appointments and contacts of the hospital team.

This new structure of the discharge letter also represented a tool to make patients more aware and autonomous in managing their therapy at home and monitoring their state of health.

GPs involvement

Meetings with GPs were organized to explain the potential benefits so as to overcome the barriers to their participation. Regarding their hospitalized patients, problems have to be faced with very old people because of cognitive impairments, anyway it was quite easy to obtain consent and share their data with their own GPs.

EHR new functionalities

From June to the end of 2014, a GPs access to ArchiMed was implemented. During April and May 2015, new functionalities were developed to consult the medical records and interact with hospital doctors.

GPs training

During September 2015, five training sessions were held and 82 out of 168 GPs decided to join CaRED. No data were collected on the 86 GPs who decided not to follow the training. Before the training, they filled out an online survey regarding their perception on the usefulness of the tool.

Evaluation methods

The main endpoint was represented by the 30-day rates of hospital readmissions and accesses to emergency departments (EDs) after discharge. Secondary endpoints regarded the patients' and GPs' satisfactions and understanding of information given at discharge.

Hospital readmissions and accesses to EDs

To assess the impact of the protocol on 30-day readmissions and ED visits, a pre-post analysis was performed, in July 2014–June 2015 (pre) and July 2016–June 2017 (post). The population included all the patients discharged from the HCCMw alive, age > 18 and living in Florentine Local Health Authority (LHA), in the study periods [15].

Readmissions or ED accesses were defined as hospital admission or visit to ED (with or without subsequent hospitalization) between 2 and 30 days after index discharge. Planned admissions [16], patients transferred to another facility and discharged against medical advice, admissions in rehabilitation or psychiatric wards and those undergoing chemotherapy or radiotherapy were excluded.

Patients' surveys

Two telephone surveys were performed in the pre (August–October 2015) and post (January–March 2016) phase of the discharge protocol implementation, involving a sample of patients (Figure 1). Patients' inclusion criteria were discharged from HCCMw in the two study periods; lived in Florentine LHA; alive at the time of the survey and who had given, at discharge, their informed consent to be interviewed. Then, a random sample was selected to be involved in the telephone survey from the patients who fulfilled the criteria. The sample size was set to 600 (300 pre and 300 post) to detect a 10% increase in a 75% proportion with a significant level of 5% and a power of 80%. In the absence of previous studies conducted in Careggi hospital, the research team estimated a 75% a priori level of satisfaction with the discharge process.

Two medical doctors were involved as interviewers. They were trained by members of the research group on how to conduct the interview in encouraging patients' participation and limiting interviewer bias. Indeed, the degree of agreement of the two interviewers in collecting answers in the same way was high. Patients were contacted between 30 and 90 days after discharge to collect data regarding information about their health, clarity and completeness of the information given at discharge concerning drug therapy reconciliation, follow-up visits and medical aids. Moreover, some questions regarded communication problems with GPs and hospital doctors and home care management. Finally, a question on self-perceived safety about going home from hospital was included.

GPs surveys

Two surveys were carried out before and after the discharge protocol implementation (Figure 1). All 168 GPs operating in the LHA were invited in the survey, 82 (49%) answered in the period before and 52 (38%) after the implementation. The pre-survey was conducted during the training sessions rewarded by Continuing Medical Education credits, while the post one by e-mail and telephone reminders. In the pre-survey, opinions and perceptions concerning quality and safety of discharge were investigated, while in the post GPs were asked to evaluate the new discharge protocol.

Statistical analysis

A descriptive analysis with χ^2 test for categorical and ordinal data, unpaired *t*-test for continuous data and Wilcoxon test for median were performed to assess significant variations in pre and post periods. For each analysis, an α level of 0.05 is considered as significant. Variations in readmissions and ED accesses were assessed by Incidence Rate Ratios. Stata 15 SE™ was used for data analyses.

Results

Hospital readmissions and access to EDs

A total of 1549 hospitalizations, representing all the admissions to the HCCMw in the two study periods considered, were included; they were, respectively, 717 (43.3%) in the pre and 832 (53.7%) in the post-intervention period. Mean age was 74.57 (SE 0.53) in the pre- and 73.33 (SE 0.54) in the post-intervention period (t -test $P=0.1007$). Male proportions were 50.83% and 47.10%, respectively, in the pre- and post-intervention periods ($\chi^2(1)=2.1305$, $P>0.05$). Mean length of stay was 8.14 (SE 0.28) in the pre- and 7.66 (SE 0.25) in the post-intervention period (t -test $P=0.2122$). The 30-day-hospital readmissions were 139 (19.4%) and 120 (14.4%), respectively, in the pre- and post-intervention periods, with a statistically significant difference ($\chi^2(1)=8.03$, $P<0.05$). No significant differences were observed for the access to ED, either as a whole (83 (11.6%) and 86 (10.3%) in the pre- and post-intervention periods, respectively; $\chi^2(1)=0.30$, $P>0.05$) or for those—although decreasing—that required hospitalization after ED passage (58 (8.1%) and 53(6.4%) in the pre- and post-intervention periods, respectively; $\chi^2(1)=1.86$, $P>0.05$).

GPs' surveys

Eighty-two and 52 GPs participated in the pre- and post-survey, respectively. Sex and years of professional experience did not significantly differ: respondents were mostly males (53(64.6%) in the pre-survey and 35(67.3%) in the post-survey), with more than 15 years of professional experience (67(82%) in the pre-study and 50(96.2%) in the post-survey).

By comparing data collected in the pre- and post-survey (Table 1), it emerged that the percentage significantly increased regarding favourable GPs statements about understanding the reasons for hospitalization ('totally': from 22% to 42.3%) and what to do if clinical conditions change ('enough relevant': from 37% to 69.2%; 'totally': from 11% to 15.4%); moreover, the easiness in contacting the hospital physician significantly increased as well ('enough relevant': from 23% to 46.2%; 'totally': from 0% to 5.5%). Moreover, a decrease was observed in the perception of relevance of the notes of comment to the discharge therapy directly accessible on the computer folder before the discharge ('enough relevant': from 65.8% to 55.8%; 'totally': from 22% to 5.8%). For the other collected data, no significant differences were observed.

Likert-scale items confirmed no statistically significant differences between the two surveys, in the perception of the effectiveness of the GP's communication on the discharge process and on the relevance of a standardized process of discharge for patient's safety, as well as of the relevance of accessing ArchiMed before the discharge and the receipt of the discharge letter via e-mail (data not shown in tables).

Patients' surveys

A total of 305 and 300 patients were included in the sample. Twenty-five and 18, respectively, were dead after discharge, so 280 and 282 patients were enrolled in the pre- and post-implementation surveys. Age and gender did not significantly differ ($\chi^2(71)=76.30$, $P=0.31$ and $\chi^2(1)=1.65$, $P=0.199$); in the pre-survey, the mean age was 74.8 years (SD 0.92) and males were 116 (41.4%); in the post-survey, the mean age

Table 1 Descriptive analysis of the data collected in the survey on GPs, in the pre- and post-periods

Questions	Pre (N = 82)		Post (N = 52)		P
	N	%	N	%	
<i>Socialization with hospital colleagues on therapy management in the last month</i>					
Never	24	29%	16	30.8%	0.08
Once	28	34%	16	30.8%	
Sometimes	18	22%	19	36.5%	
Frequently	10	12%	1	1.9%	
Missing	2	2%	0	0.0%	
<i>Importance attributed to home therapy provision by the hospital doctor in charge for his/her patient</i>					
Not at all	0	0.0%	0	0.0%	0.16
Little relevant	4	5%	2	3.9%	
Enough relevant	26	32%	25	48.1%	
Highly relevant	52	63%	25	48.1%	
Missing	0	0.0%	0	0.0%	
<i>How much the current discharge letter facilitates communication on the reasons for hospitalization</i>					
Not at all	1	1%	0	0.0%	0.03
A little	10	12%	1	1.9%	
Enough relevant	50	61%	29	55.8%	
Totally	18	22%	22	42.3%	
Missing	3	4%	0	0.0%	
<i>How much the current discharge letter facilitates communication on home therapy</i>					
Not at all	2	2%	0	0.0%	0.29
A little	17	21%	8	15%	
Enough relevant	44	53%	36	69%	
Totally	18	22%	8	15%	
Missing	2	2%	0	0.0%	
<i>In case of doubt on discharge therapy mentioned in the discharge letter, how easy it is to contact the hospital physician</i>					
Not at all	19	23%	1	1.9%	<0.01
A little	42	51%	24	46.2%	
Enough relevant	19	23%	24	46.2%	
Totally	0	0%	3	5.7%	
Missing	2	2%	0	0.0%	
<i>How much the current discharge letter facilitates communication of what to do if conditions change</i>					
Not at all	6	7%	0	0%	<0.01
A little	36	44%	8	15.4%	
Enough relevant	30	37%	36	69.2%	
Totally	9	11%	8	15.4%	
Missing	1	1%	0	0.0%	
<i>Effectiveness—in terms of adherence to therapy—to provide the patient with a clear, simple and personalized summary table to facilitate the compliance to therapy</i>					
Not effective	2	2%	1	1.9%	0.10
Enough effective	29	35%	11	21.2%	
Highly effective	50	61%	40	76.9%	
Missing	1	1%	0	0.0%	
<i>Effectiveness in providing patient information on visits and examinations</i>					
Not at all	1	1%	0	0.0%	0.55
A little	7	9%	3	5.8%	
Enough relevant	31	38%	16	30.8%	
Totally	43	52%	33	63.4%	
Missing	0	0%	0	0.0%	
<i>The relevance of the notes of comment to the discharge therapy directly accessible on the computer folder before the discharge</i>					
Not at all	2	2%	1	1.9%	0.01
A little	8	10%	19	36.5%	
Enough relevant	54	66%	29	55.8%	
Totally	18	22%	3	5.8%	
Missing	0	0.0%	0	0.0%	

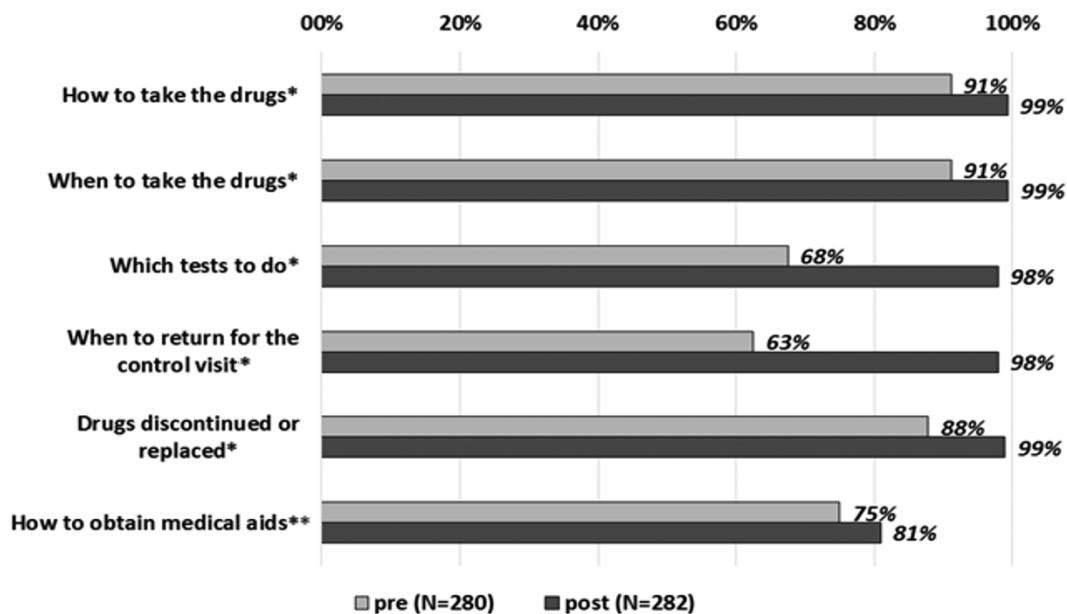


Figure 2 Information from the hospital doctors on how to manage their condition at home, before (pre) and after (post) the implementation of the new discharge protocol.

* $P < 0.01$; ** $P = 0.40$.

was 74.8 years (SD 0.90) and males were 132 (46.8%). Seventeen (6%) and thirteen (4.6%) patients were re-hospitalized during the pre- and post-survey, respectively ($\chi^2(1) = 0.60$, $P = 0.44$). In both surveys, over 50% (58.8% and 60.1%, respectively; $\chi^2(1) = 0.11$, $P = 0.74$) needed a caregiver to manage their health condition. Caregivers' mean age was 57.9 years (SD 1.09) in the pre-survey and 58.3 years (SD 1.19) in the post-survey ($\chi^2(58) = 71.7$, $P = 0.11$) and most of them were females (98(66.1%) and 120(67%), respectively, in the pre- and post-survey, $P = 0.78$). Caregivers' education was significantly ($\chi^2(1) = 0.08$, $P < 0.01$) lower in the pre-survey: the percentage attending high school or university was, respectively, 70% (114) and 78% (129).

Figure 2 reports responses to information provided by hospital doctors on how to manage the disease at home.

In the post-implementation survey, the percentage of patients who reported having useful information increased significantly. In particular, the percentage of patients who reported having had information on which tests to do (from 67.5% to 97.9%) and when to return for follow-up visit (from 62.5% to 97.9%) strongly increased. No significant differences were observed for what concerns medical aids.

Table 2 shows data collected in the other sections of the questionnaire.

For what concerns the discharge letter information, a statistically significant ($P < 0.01$) increase in understandability and clarity was observed, for all the investigated aspects. Data are confirmed by the Likert-scale items (from 1—unclear—to 10—very clear; data not shown in tables), in which a significant increase in the median values was observed from the pre- to the post-survey: from 8 to 10 ($P < 0.01$) for the items 'How clear are the written information on the examinations and on the follow-up visits to be made?', 'How clear are the written information on how to take the prescribed drugs?', 'How clear are the written information on when to take the prescribed drugs?' and 'How clear are the written information on the duration of therapy?.'

Regarding questions related to problems encountered after returning home, no statistically significant differences were observed in the two study periods for most of the investigated aspects, with the exception of the delivery time of the discharge letter to the GPs (91% (211) and 96% (235) declared a delivery time shorter than 7 days, respectively, in the pre- and post-surveys) and in giving advice on how to manage care after discharge (12% (34) and 80% (226) declared to totally know while 78% (217) and 14% (41) to know enough, respectively, in the pre- and post-survey).

Discussion

Statement of principal findings

The aim of the study was to evaluate the impact of a new discharge protocol on hospital readmissions and patients' and GPs' perception. The 30-day hospital readmissions, comparing the pre- and post-implementation phases of the study, incurred a significant decrease. Regarding the patient's perception of the discharge process, the level of understanding of some key points, such as reason for hospitalization, post-discharge therapy, follow-up examinations and way of contacting the hospital ward, showed a significant improvement.

Strengths and limitations

One of the most important strengths was the endorsement provided by the ward head and by the hospital management and, consequently, the involvement of a supportive management structure. Another success factor was the GPs involvement, supported by a strong alliance between hospital and LHA management.

As for limitations, factors influencing a re-hospitalization are many and different (clinical, demographic and more) and not totally controllable only by improving management inside and outside hospitals. This could affect the interpretation and

Table 2 Descriptive analysis of data collected in the pre- and post-implementation surveys related to patients' experience

Questions	Pre (N = 280)		Post (N = 282)		P	
	N	%	N	%		
Section related to the information written on the documents delivered at the time of discharge from the hospital	How easy was understanding the reason for hospitalization					
	Not at all	3	1%	1	0%	<0.01
	A little	15	5%	1	0%	
	Enough	192	69%	9	3%	
	Totally	70	25%	268	95%	
	Missing	0	0%	3	1%	
	How easy was understanding the drugs to be taken (administered)					
	Not at all	12	4%	2	1%	<0.01
	A little	13	5%	4	1%	
	Enough	204	73%	14	5%	
	Totally	51	18%	259	92%	
	Missing	0	0%	3	1%	
	How easy was understanding how to contact the department in case of doubts or need					
	Not at all	69	25%	4	1%	<0.01
	A little	121	43%	7	2%	
	Enough	77	28%	17	6%	
	Totally	12	4%	251	89%	
	Missing	1	0%	3	1%	
Section related to any problems that may have been encountered after returning home	Did you have any problems in the management of care after returning home					
	Yes	60	21%	41	15%	0.06
	If yes, problems encountered					
	Drugs supply	6	10%	2	5%	0.22
	Contacting the staff	12	20%	2	5%	0.05
	Activating artificial nutrition	2	3%	1	2%	0.80
	Activating the physiotherapy	4	7%	3	7%	0.89
	Activating district nurses for dressing	1	2%	0	0%	0.41
	Other	39	65%	30	73%	0.41
	Delivery of the discharge letter to the family practitioner					
	Yes	233	83%	246	87%	0.18
	If the discharge letter was delivered to the family practitioner, what was the delivery time ^a					
	1–2 days	0	0%	0	0%	<0.01
	3–7 days	211	91%	235	96%	
	7 days or more	20	9%	3	3%	
	Missing	2	0%	8	1%	
	If the letter was not delivered to the family practitioner, the person intended to do it in the next days ^b					
	Yes	27	57%	26	72%	0.34
	Reasons for not delivering the discharge letter ^c					
	I don't think I will need	11	55%	5	56%	0.54
	I have no time	7	35%	3	33%	
	I don't want to do for confidentiality reasons	1	5%	0	0%	
	I couldn't reach him	0	0%	1	11%	
	Missing	0	0%	0	0%	
	Knowledge on how to manage the practical aspects of care, after discharge					
	Not at all	9	3%	5	2%	<0.01
	A little	20	7%	10	4%	
	Enough	217	78%	41	14%	
	Totally	34	12%	226	80%	
	Missing	0	0%	0	0%	

^aPre, N = 233, post, N = 246.

^bPre, N = 54; post, N = 40.

^cPre, N = 19; post, N = 9.

the generalizability of the results, as most of the confounders have not been considered in our study. Particularly, it is to note that the patients' main characteristics at admission such as disease severity of morbidity were not available, as well as a control group. Moreover, as previously cited, the participation of the GPs has not been optimal (less of 50% in the two phases of the study) and different between the two

surveys, with a risk of selection bias. Regarding data collected in the patients' survey, recall bias and social desirability have to be mentioned, as well as potential bias related with having conducting telephone interviews (difficulties in verifying who is responding). On the other hand, telephone interviews can limit interviewer's biases related with their physical characteristics.

Finally, the fact of studying the discharge process may in itself lead to improved outcomes, irrespective of the nature of the intervention.

The success of these interventions in the Italian context depends a lot on cultural as well as organizational changes. The meetings with the GPs and the surveys represented essential tools for detecting their needs and understanding the degree of satisfaction with the solution implemented, as well as assessing the willingness to collaborate for the shared management of patients.

Interpretation within the context of the wider literature

The decrease in 30-day hospital readmissions is consistent with the original RED project, in which the number of re-hospitalizations significantly decreased after applying the RED procedure [10]. The specific reasons that link the discharge letter to the 30-day hospital readmissions need to be better investigated with specific future studies, to be conducted also on targeted groups.

The main improvement perceived by GPs was a greater effectiveness of communication and the possibility of accessing ArchiMed, in spite of not being part of the public healthcare service. By means of Information Technology (IT) solutions for communication in healthcare assistance, as reported also by other studies [17], CaRED aimed to overcome the distance between hospital and primary care thanks to ArchiMed, an EHR developed in-house, easily customizable, for answering to new organizational needs.

Implications for policy, practice and research

After the pilot phase and the promising results obtained, the CaRED project was implemented throughout the Careggi Teaching Hospital, becoming a communication flow between hospital and primary care and overcoming negative adverse events along the continuum of care transition [18, 19].

The CaRED experience is an attempt to build an active collaboration between hospital and local healthcare workers supported by IT solutions aimed at assuring quality and safety of care.

Gaining better communication showed a statistically significant improvement in informational continuity of care and more appropriate access to the hospital where stakeholders were purposefully engaged in richer and less cumbersome professional tasks [20–22]. The exchange of patient clinical information becomes the determining factor for better assistance by facilitating the taking charge and continuity of care, from one provider to another and from one clinical event to another. The designed system assumes greater importance for frail subjects, that is people who are often affected by multimorbidities and without an effective social network of protection, but it can be useful in any circumstance in which the informational continuity of care can be threatened by external factors. This is also in line with the modern managerial approach of the so-called Health Literate Organizations [23–25].

Conclusions

CaRED tested interesting solutions for future profitable collaboration between hospital and primary care: new tools

for communicating; development of non-technical skills of healthcare workers; in-house IT solutions management and better integration with hospital primary care in the patient flow management.

As proof of the positive feedback received until now, CaRED has been extended to all the GPs operating in Tuscany and in all Careggi Teaching Hospital, allowing better quality of communication assessment as well as a better handover between hospital and primary care.

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Contributorship

Conception and design: D.P. and A.M.; acquisition of data: D.P., S.F., S.D.A., A.P., A.M., A.B. and M.T.; analysis and interpretation of data: D.P., G.B., C.L., S.F., M.T., G.T. and A.M.; statistical analysis: S.F. and S.D.A.; administrative, technical or material support: B.D. and supervision: F.N. All authors contributed to the writing of the manuscript, approved the final version for submission and are in agreement with the content of the manuscript.

Ethics and other permissions

The ethics committee of Careggi Teaching Hospital approved the project on 9 June 2014 (CE 14.103 code: 6276).

Data availability statement

The data underlying this article will be shared on reasonable request to the corresponding author.

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