The road to successful geriatric rehabilitation

Holstege, M.S.

CHAPTER 4

Changes in geriatric rehabilitation: a national programme to improve quality of care. The synergy and innovation in geriatric rehabilitation study

Marije S Holstege[1,2] MSc; Monique AA Caljouw[1] PhD; Ineke G Zekveld[1] MSc; Romke van Balen[1] MD PhD; Aafke J de Groot[3] MSc; Jolanda CM van Haastregt[4] PhD; Jos MGA Schols[4,5] MD PhD; Cees MPM Hertogh[3] MD PhD; Jacobijn Gussekloo[1] MD PhD; Wilco P Achterberg[1] MD PhD

[1] Dept. of Public Health and Primary Care, Leiden University Medical Center, Leiden, the Netherlands.
[2] Dept. of Research and Development, Evean, Purmerend, the Netherlands
[3] Dept. of General Practice and Elderly Care Medicine, VU University Medical Center, Amsterdam, the Netherlands
[4] Dept. of Health Services Research, Maastricht University, Maastricht, the Netherlands
[5] Dept. of Family Medicine, Maastricht University, Maastricht, the Netherlands

International Journal of Integrated care 2015 December15;15:e045.

ABSTRACT

Objective

To describe changes in the health service delivery process experienced by professionals, patients and informal caregivers during implementation of a national programme to improve quality of care of geriatric rehabilitation by improving integration of health service delivery processes.

Study Setting

Sixteen skilled nursing facilities

Study Design

Prospective study, comparing three consecutive cohorts.

Data Collection

Professionals (elderly care physicians, physiotherapists and nursing staff) rated four domains of health service delivery at admission and at discharge of 1075 patients. In addition, these patients [median age 79 Interquartile range 71-85 years, 63% females] and their informal caregivers rated their experiences on these domains 4 weeks after discharge.

Principal Findings

During the three consecutive cohorts, professionals reported improvement on the domain team cooperation, including assessment for intensive treatment and information transfer among professionals. Fewer improvements were reported within the domains alignment with patients' needs, care coordination and care quality. Between the cohorts, according to patients (n=521) and informal caregivers (n=319) there were no changes in the four domains of health service delivery.

Conclusion

This national programme resulted in small improvements in team cooperation as reported by the professionals. No effects were found on patients' and informal caregivers' perceptions of health service delivery.

Keywords

Geriatric rehabilitation, health service delivery, national programme, quality of care, care process

INTRODUCTION

In the Netherlands, postacute geriatric rehabilitation takes place in skilled nursing facilities, with a comprehensive rehabilitation team which often includes an elderly care physician, nursing staff, physiotherapist and occupational therapist, together with a psychomotor therapist, psychologist, social worker, speech therapist, dietician and pharmacist[1]. Geriatric rehabilitation is defined as a multidisciplinary set of evaluative, diagnostic and therapeutic interventions with the purpose to restore functioning or enhance residual functional capability in older people with disabling impairments[2]. The medical diagnosis for geriatric rehabilitation can be categorized into four main groups, i.e. stroke, trauma, joint replacement and a miscellaneous group for other diagnoses, i.e. COPD, amputee, heart failure.

The organisation of geriatric rehabilitation is a complex care process which suffers from a fragmented approach allowing room for improvement in the coordination, communication and continuity of care between the various health care providers and professionals involved[3]. Because most geriatric rehabilitation is provided after acute hospitalization of older persons, effective collaboration between hospitals and postacute care settings for the development and performance of integrated care is essential[4-6]. Poor organisation of care has a negative impact on health care costs, patient outcomes and patient satisfaction with care[7, 8].

An important challenge when developing integrated care is to get the patient and informal caregiver more involved in the rehabilitation process. Involvement of the patient and informal caregiver can improve continuity of care, quality of care and positive experiences with care[9-11]. Therefore, it is important to use different perspectives (patient/professional/informal caregiver) in the evaluation of processes and outcomes on the level of health service delivery (i.e. alignment with patients care needs; care coordination; team cooperation; and quality of care[12]. However, few studies have evaluated multiple perspectives involved with changes in health service delivery[9, 10, 13].

To improve the quality of service delivery for geriatric rehabilitation in the Netherlands, a national programme was initiated by the Dutch Ministry of Health, Welfare and Sport in 2011. The aim of this programme was to stimulate self-organising capacity to develop integrated geriatric rehabilitation in order to improve the health service delivery. This programme was introduced at a time when the health care system was transforming from a typical long-term care government-guided reimbursement system without financial incentive for efficient geriatric rehabilitation, towards a more market-guided bundled payment system Internationally, bundled payment systems appear to be a strong incentive for collaborating geriatric rehabilitation service organisations with the goal to improve quality of care[6, 13].

The aim of this study is to describe changes in the health service delivery process during implementation of the national programme, as experienced and rated by professionals, patients and their informal caregivers.

METHODS

Study design

During implementation of the national programme in the Netherlands, a prospective longitudinal mixed method study was performed among the participating skilled nursing facilities, i.e. the Synergy and INnovation in GEriatric Rehabilitation (SINGER) Study. For data collection, three consecutive cohorts (each cohort recruited over a 4-month period in March 2011, September 2011 and March 2012), were used to evaluate changes in perceptions of health service delivery during implementation of the national programme. The first cohort was enrolled at the start of the implementation phase, and the second and third cohorts at 6 and 12 months, respectively, after the start of the national programme. The process evaluation with quantitative measures was postulated by the Dutch Ministry of Health

Participants

Eighty groups of collaborating geriatric rehabilitation service organisations that wanted to participate in the national programme provided an action plan outlining the goals they aimed to achieve to improve their quality of care. A geriatric rehabilitation service organisation consisted of at least one skilled nursing facility, a hospital and a health insurance company, but could also include home care providers, primary care providers (e.g. physiotherapists, occupational therapists) or rehabilitation centers. From the 80 available geriatric rehabilitation service organisations, the Dutch Ministry of Health, Welfare and Sport selected 16 for the national programme based on their initial plans and national coverage. Data collection took place in the skilled nursing facilities of the selected organisations.

Patients admitted to a participating skilled nursing facility for geriatric rehabilitation were recruited for participation. For each participating patient, their professional caregivers (elderly care physician, physiotherapist and one delegate of the nursing staff) and informal caregivers involved were also invited to participate. The study population was recruited in three consecutive cohorts starting in March 2011, September 2011 and March 2012 (spanning a 4-month period for each cohort).

Each skilled nursing facility was asked to include a minimum of (the first) 10-15 admitted patients, stratified for diagnostic group, in each cohort. Excluded from the study were patients with a diagnosis of dementia.

A waiver of consent was given by the Medical Ethics Committee of the Leiden University Medical Center (LUMC).

National intervention programme

The Ministry of Health, Welfare and Sport initiated the national programme with the aim to stimulate self-organising capacity to develop integrated geriatric rehabilitation in order to improve the health service delivery. The Ministry provided financial support to the participating geriatric rehabilitation service organisations for internal project management. The health insurance companies provided financial incentives for the more intensive treatment programmes. In addition, the geriatric rehabilitation service organisations themselves contributed to the implementation of their goals to improve geriatric rehabilitation service delivery. Each participating geriatric rehabilitation service organisation was responsible for the internal project organisation, implementation of their action plan, and for achievement of their formulated goals. During implementation of the programme, nine national meetings were held with the project board and members of the participating geriatric rehabilitation service organisations. The project board consisted of an expert team of stakeholders with the aim to initiate, identify and disseminate best practices between the involved geriatric rehabilitation service organisations. During these meetings, representatives of the 16 geriatric rehabilitation service organisations shared their experiences and knowledge. In addition, preliminary process outcomes on this national evaluation study were presented as feedback for the ongoing implementation process. To monitor and supervise the action plans and goals, using the plan-do-study-act cycles[14], two national process managers visited the internal project managers of each geriatric rehabilitation service organisations at the start of the implementation (between July and December 2011) and twice during follow-up. These process managers had a more qualitative approach and interviewed the internal project managers of each geriatric rehabilitation service organisations on the facilitators and barriers of this national incentive and reported in a process evaluation[15]. The lessons learned from these interviews were reported in a guidebook [16] and summarized in Box 1.

Content of the programme

To improve the geriatric rehabilitation service, each geriatric rehabilitation service organisation set its goals to optimize integrated care. Integrated care is defined as "*a concept bringing together inputs, delivery, management and organisation of services related to diagnosis, treatment, care, rehabilitation, and health promotion. Integration means to improve the service in relation to access to care, quality of care, user satisfaction, and efficiency of care*".[17] For that purpose each geriatric rehabilitation service organisation developed or improved care pathways for a specific group, i.e. stroke, joint replacement and hip fracture, as well as for other smaller groups of specific diseases (i.e. COPD, am-

Box 1. Facilitators and Barriers during the national incentive according to the national process managers

Facilitators:

- A top-down mandate is necessary to bring about changes and to collaborate the different stakeholders to set goals together.
- Commitment of all participating organisations to participate, wanting to invest (time, capacity and education) and focusing on the benefit for the patient instead of organisational interest is essential to optimize integrated care.
- Project management was necessary to maintain the process and keep focus on the outcomes. Also a project group with participants from the different organisations and a mix of management, health professionals, innovators, and incorporating the patients' opinion is warranted.
- The development of goals had to fit daily practice, and had to connect with the process and content of care to get a good adaptation in the health service delivery.

Barriers:

- Development of integrated care within a changing healthcare economy, with little room for investment hampers the process.
- The benefit of the innovation is not always to the benefit of the organisation that invests.
- A lack of communication between patient registration systems across organisations hampers the process.

putation, heart failure), or for all patient groups. A care pathway is defined as a complex intervention for the mutual decision-making and organisation of care processes for a well-defined group of patients during a well-defined period[18, 19].

Within the national programme the main goals of development of integrated care in geriatric rehabilitation can be divided into four domains of (geriatric rehabilitation) service delivery, according to the evaluation model of Hartgerink et al.[12], i.e. 1) with patients (care) needs; 2) care coordination 3) team cooperation, and 4) quality of care. Box 2 presents the main goals of development in this national programme based on these domains and aiming to improve quality of care.

Data collection and outcome measures

Professional caregivers collected patient characteristics, i.e. age, gender, Barthel Index[20] and indication for geriatric rehabilitation by diagnostic group, as well as process outcomes of geriatric rehabilitation service delivery, were collected for each cohort at admission and again at discharge by means of an online questionnaire. A helpdesk was available for any questions concerning the online questionnaire.

In addition, patients and informal caregivers filled in a (paper version) questionnaire to measure their experiences with the process of geriatric rehabilitation service delivery 4 weeks after patient discharge.

The experience with the geriatric rehabilitation health service delivery processes was measured with self-developed questionnaires based on face validity for the professionals, as well as for patients and informal caregivers; all questions (answered on a 4-point

Box 2. Main goals of development of integrated care within the skilled nursing facilities in the four domains of geriatric rehabilitation service delivery

Domains of geriatric rehabilitation service delivery	Main goals of development
1. Alignment with patients' (care) needs	The professionals invested in (more) involvement of the patient and informal caregiver in the rehabilitation process (goal attainment). For example: in setting rehabilitation goals, process of referral for post-acute and home care, involvement in the multidisciplinary team meetings, and discharge planning.
2. Care coordination	The healthcare providers and professionals aimed to work closely together to achieve common patient-centered goals of care to improve the quality and continuity of care by: • Developing structured care pathway(s) and (information, communication and clinical) guidelines. • Developing assessment and referral instruments to determine priority of need and proper place of treatment (triage). • Introducing case managers who coordinated care, aimed to reach 'seamless' care and alignment with the patient needs during the continuum from acute to postacute care.
3. Team cooperation	Aiming at improving inter-professional information handover and alignment of professional performance during the care pathway. For example by: • Introducing digital patient registration • Using multidisciplinary treatment plans • Evaluating rehabilitation goals in multidisciplinary team meetings. • Involvement of the elderly care physician (of the skilled nursing facility) in the multidisciplinary team meeting in the hospital
4. Quality of care	Aiming at improving quality of care by: • Improving the communication of professionals towards patients and informal caregivers. • Enhancing the rehabilitation culture by stimulating and facilitating individual exercises at the rehabilitation ward and empowering the patient in the rehabilitation process. • Stimulating knowledge exchange between the professionals of the different healthcare providers by exchange programs and 'on-the-job training' in a different setting. • Education of the professionals Introducing more treatment intensity (i.e. 6 h/per week) for a selected population. For example, by: • Implementation of more treatment moments during the day or more treatment days a week • Beside individual treatment, also (mono and multi-disciplinary) group therapy • Enhancing and stimulating patients to do more individual exercise, e.g. by using an exercise agenda.

Likert scale) concerned the four domains of health service delivery. Questions on(1) alignment with patients care needs were filled out by the elderly care physicians and physiotherapists; on (2) care coordination were filled out by the elderly care physicians

and a member of the nursing staff; on (3) team cooperation were filled out by all three professionals; and questions on (4) care quality were filled out by the nursing staff.

The questionnaire for the patients and informal caregivers covered also all these four domains.

Statistical analysis

Descriptive statistics were used to analyze outcomes on the four domains of health service delivery as reported by the professionals, patients and informal caregivers. For each question, the percentage of the category 'good and excellent' was reported versus the answer option 'poor and fair'. To compare the outcomes of the three consecutive cohorts, *P* for trend values were calculated with the Kruskal-Wallis test and, in case of numeric data, values were calculated with one-way analysis of variance (ANOVA). A *P* for trend ≤ 0.05 was considered statistically significant. All patients with data from all three professional caregivers at admission to the skilled nursing facility (baseline) and who had not died and who were not readmitted to hospital during the rehabilitation stay were included for analysis of the process outcomes at admission, discharge and four weeks follow up.

Data were analyzed using IBM SPSS Statistics for Windows, version 20.0.

RESULTS

Respons and background characteristics

The flowchart of patient recruitment and follow-up is presented in Figure 1.

Of the 1150 eligible patients, at baseline 1075 patients (93.5%) had completed questionnaires from all three professionals and were included in the present study. At discharge 1018 patients (95%) were included for data analysis. Of this latter group, at 4 weeks after discharge 774 patients were eligible for follow-up measurement. Finally, 512 patients and 319 of their informal caregivers had provided a response to the follow-up questionnaire.

Each of the 16 skilled nursing facilities included a median of 46.5 (IQR 28-126) patients. Overall, the baseline population of patients (n=1075) had a median age of 79 (IQR 71-85) years, consisted of 63% females, and were categorised into stroke (36%), elective joint replacement (15%), traumatic injuries (25%), and other smaller groups of specific diseases (i.e. COPD, amputation, heart failure (24%). There were no differences in age, gender and baseline Barthel Index between the cohorts. The informal caregivers (n=319) had a median age of 65 (IQR 56-75) years and consisted of 66% females. The relationship between informal caregivers and patients was: spouse (49%), sibling (4%), daughter or

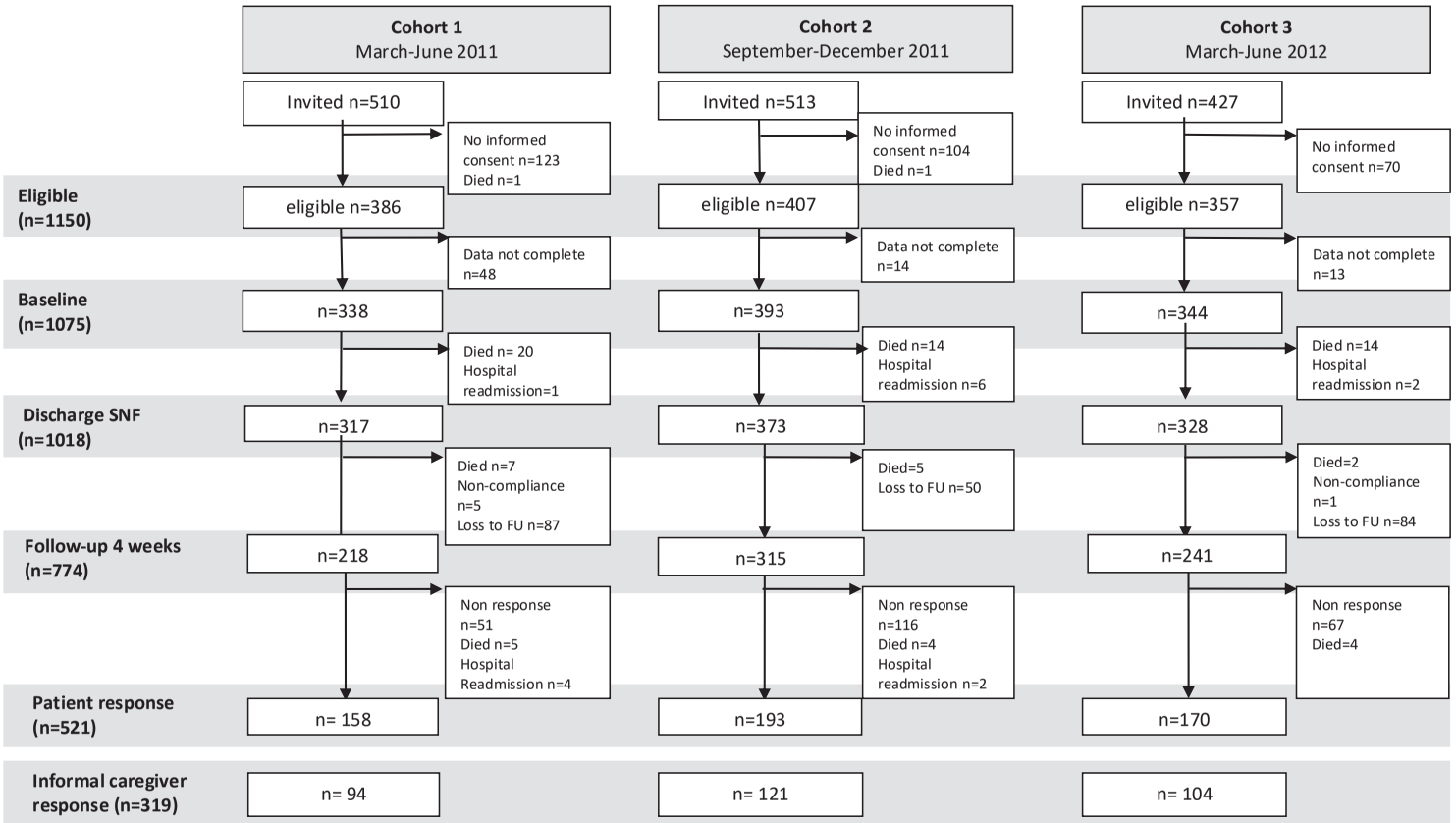

Figure 1. Flowchart of patient recruitment and follow-up in the 16 skilled nursing facility. Analysed data includes data rated by professional caregivers at admission and discharge, and response at 4 weeks' follow-up, of patients and their informal caregivers.

son (36%), and other relation (11%). There were no differences in age, gender and type of relationship between the cohorts.

Process outcomes

Tables 1-4 present the outcomes (in percentage 'good and excellent') on geriatric rehabilitation service delivery process as reported by the professionals (elderly care physicians, nursing staff and physiotherapists), patients, and their informal caregivers.

Alignment with patients (care) needs: do professionals give what patients need? (Table 1)
Professionals

Involvement of the patient by the physiotherapist in setting rehabilitation goals decreased across three cohorts (p trend=0.05). Elderly care physicians reported high patient involvement in setting rehabilitation goals in all cohorts, with no significant change between the cohorts (p trend=0.69). In contrast, the percentage involvement of the informal caregiver in setting rehabilitation goals had increased (p trend <0.01), as reported by elderly care physicians. Physiotherapists reported that in total (all three cohorts together) 155 (21%) of the informal caregivers were involved in setting rehabilitation goals, but with no change over time (p=0.85).

Across three cohorts, there was an increase in the percentage of patients and/or informal caregivers attending the multidisciplinary team (meeting or the discussion of individual care plans, as reported by elderly care physicians (p trend=0.05)

Patients and informal caregivers

Across three cohorts there was a non significant increase in the percentage involvement of setting rehabilitation goals, as reported by the informal caregivers (p-trend: 0.06). In total, 312 (61%) patients and 150 (48%) informal caregivers reported a 'good' or 'excellent' way of dealing with individual needs, with no difference between the three cohorts (p trend=0.85 and 0.74, respectively).

In total, 48% of the patients and 52% of the informal caregivers were involved in the decision-making process for referral to a rehabilitation location after a hospital stay, with no difference in trend between the cohorts (p trend= 0.38 and 0.85, respectively).

Care coordination (Table 2)
Professionals

Across three cohorts, professionals gave a higher rating (percentage 'good or excellent') for guidance and support of patients' transfer from hospital to a skilled nursing facility (p trend <0.01). The rating of patients and informal caregivers for guidance and support with the transfer from a skilled nursing facility to home remained the same in all three

Table 1. *Alignment with patients (care) needs, do professionals give what patients need?* According to professionals (elderly care physicians and physiotherapists), patients and informal caregivers in percentage good and excellent. Selection of patients with completed professional data at baseline who had not died and were not readmitted to hospital during their rehabilitation stay (n=1018).

	Responders	Cohort 1 March-June 2011		Cohort 2 Sept-Dec 2011		Cohort 3 March-June 2012		P for trend
		N	n (%)	N	n (%)	N	n (%)	
Professional rating*								
Patient involvement in setting rehabilitation goals	ECP	264	216 (81.8)	348	275 (97)	309	247 (79.9)	0.69
	PT	260	186 (71.5)	354	259 (73.2)	313	203 (64.9)	0.05
Informal caregiver involvement in setting rehabilitation goals	ECP	242	131 (54.1)	325	220 (67.7)	277	163 (58.8)	<0.01
	PT	202	44 (21.8)	289	57 (19.7)	258	54 (20.9)	0.85
Patient/informal caregiver attending the multidisciplinary team meeting (SNF)	ECP	265	49(18.5)	349	94(26.9)	310	73(23.5)	0.05
Patients/Informal caregivers rating#								
Way of dealing with individual needs	P	155	95 (61.3)	191	119 (62.3)	165	98 (59.4)	0.85
	IC	90	44 (48.9)	118	54 (45.8)	102	52 (51)	0.74
Involvement in setting rehabilitation goals	P	125	86 (68.8)	174	110 (63.2)	148	92 (62.2)	0.48
	IC	72	30 (41.7)	99	59 (59.6)	86	41 (47.7)	0.07
Involvement in referral to a rehabilitation location	P	154	78 (50.6)	190	83 (43.7)	170	84 (49.4)	0.38
	IC	92	46 (50)	120	61 (50.8)	104	56 (53.8)	0.85

ECP: Elderly Care Physician; PT: Physiotherapist; P: Patient; IC: Informal Caregiver. Values are numbers (% good and excellent) unless indicated otherwise. P for trend values were calculated with the Kruskal-Wallis test

Professional rating N total: C1: n=317; C2: n=373; C3: n=328

Patient rating N total: C1:158; C2:193; C3:170

Informal Caregiver rating N total: C1:94; C2:121; C3:104

*rated at discharge from skilled nursing facility (SNF)

#rated 4 weeks after discharge SNF

Table 2. *Care coordination* according to professionals (elderly care physicians and nursing staff), patients and informal caregivers in percentage good and excellent. Selection of patients with completed professional data at baseline and not-died or having a readmission to hospital during their rehabilitation stay (n=1018).

	Responders	Cohort 1 March-June 2011		Cohort 2 Sept-Dec 2011		Cohort 3 March-June 2012		P for trend
		N	n (%)	N	n (%)	N	n (%)	
Professional rating								
Guidance and support of the patient from hospital → SNF[$]	NS	281	217(77.2)	346	305 (88.2)	310	276 (89)	<0.01
Guidance and support of the patient from SNF → home[*]	NS	267	261 (97.8)	347	339 (97.7)	304	298 (98)	0.96
Guidance and support of the informal caregiver SNF → home[*]	NS	267	240 (89.9)	347	309 (89)	304	275 (90.5)	0.84
Preparation of the patient for discharge[*]	ECP	252	230 (91.3)	338	307 (90.8)	298	271 (90.9)	0.98
Patients/Informal caregivers rating[#]								
Coordination of the transfer hospital →SNF	P	153	88 (57.5)	187	118 (63.1)	165	104 (63)	0.50
	IC	88	43 (48.9)	118	50 (42.4)	103	53 (51.5)	0.38
Coordination of the transfer SNF → home	P	154	88 (57.1)	186	116 (62.4)	167	107 (64.1)	0.42
	IC	89	43 (48.3)	115	60 (52.2)	103	58 (56.3)	0.54

SNF. NS: Nursing Staff; ECP: Elderly Care Physician; P: Patient; IC: Informal Caregiver. Values are numbers (% good and excellent) unless indicated otherwise. P for trend values were calculated with the Kruskal-Wallis test

Professional rating N total: C1: n=317; C2: n=373; C3: n=328

Patient rating N total: C1:158; C2:193; C3:170

Informal Caregiver rating N total: C1:94; C2:121; C3:104

[$] rated at admission skilled nursing facility (SNF)

[*] rated at discharge SNF

[#] rated 4 weeks after discharge

cohorts (p=0.96 and p=0.84, respectively), as did the rating for the preparation of the patient for discharge home (overall 91%, p trend=0.84).

Patients and informal caregivers

The rating for guidance and support with the transfer from hospital to skilled nursing facility (percentage 'good' or 'excellent') did not change over time, as rated by patients (p trend=0.50) and informal caregivers (p trend=0.38); neither did satisfaction with the transfer from skilled nursing facility to home as reported by patients (p trend=0.42) and informal caregivers (p trend=0.54).

Team cooperation (Table 3)

Professionals

There was an improvement in the rating (percentage 'good or excellent') of the information handover between professionals from hospital to skilled nursing facility, as reported by the nursing staff (p trend=<0.01) and elderly care physicians (p trend=0.04). Rating of the information handover between physiotherapists improved significantly from skilled nursing facility to follow-up care (p trend=0.01) and did not change between nurses and between medical specialists from skilled nursing facility to follow-up care.

There was an increase of the (small) percentage of elderly care physicians who participated in the MDT hospital meetings (p trend=0.04), to determine the priority of need and proper place of treatment (triage). There was no change in the percentage of consultations by rehabilitation physicians during the rehabilitation stay (p trend=0.14).

In the skilled nursing facility, in 98% of the MDT meetings the team consisted of an elderly care physician, a physiotherapist and a member of the nursing staff. In addition, the MDT meetings consisted of an occupational therapist (79%), speech therapist (39%), a dietician (26%) and other professional(s) (51%) (i.e. psychologist, social worker, creative therapist, nurse practitioner, case manager). Only participation of the occupational therapist showed an increase across cohorts (p trend <0.01). Rehabilitation goals were evaluated weekly or every two weeks for 64% of the included patients.

According to the elderly care physician, the amount of patients assessed for the indication of more intensive treatment at the rehabilitation ward increased by 10% between cohort 1 and cohort 3 (p trend=0.01).

Patients and informal caregivers

In all cohorts, patients and informal caregivers reported similar percentages for good and excellent alignment of the professionals.

Table 3. *Team cooperation* according to professionals (elderly care physicians, nursing staff and physical therapists), patients and informal caregivers in percentage good and excellent. Selection of patients with completed professional data at baseline and not-died or having a readmission to hospital during their rehabilitation stay (n=1018).

	Responders	Cohort 1 March-June 2011		Cohort 2 Sept-Dec 2011		Cohort 3 March-June 2012		P for trend
		N	n (%)	N	n (%)	N	n (%)	
Professional rating								
Consulted ECP in the multidisciplinary team meeting in the hospital	ECP	311	13 (4)	367	9 (3)	323	21 (6.2)	0.05
Consulted rehabilitation physician during rehabilitation stay	ECP	265	26 (9.8)	349	48 (13.8)	310	29 (11.1)	0.14
Assessment of patients for indication intensive treatment at the SNF (yes)[*]	ECP	313	211 (67.4)	368	252 (68.5)	328	254 (77.4)	0.01
Information handover between professionals hospital à SNF[$]								
between nurses	NS	314	227 (72.3)	365	297 (81.4)	327	270 (82.6)	<0.01
between physical therapists	PT	316	162 (51.3)	369	215 (58.3)	327	177 (54.1)	0.18
medical information transfer	ECP	313	163 (52.1)	368	214 (58.2)	328	203 (61.9)	0.04
Information handover between professionals SNF à follow up care[*]								
between nurses	NS	267	217 (81.3)	347	293 (84.4)	304	241 (79.3)	0.23
between physical therapists	PT	265	157 (59.2)	355	238 (67)	315	226 (71.7)	0.01
medical information transfer	ECF	261	233 (89.3)	343	307 (89.5)	304	278 (91.4)	0.62
Patients/Informal caregivers rating[#]								
alignment of the professionals	P	135	84 (62.2)	180	110 (61.1)	164	86 (52.4)	0.15
	IC	85	41 (48.2)	112	54 (48.2)	98	39 (39.8)	0.39

NS: Nursing Staff; ECP: Elderly Care Physician; PT: Physical therapist; P: Patient; IC: Informal Caregiver. Values are numbers (% good and excellent) unless indicated otherwise. P for trend values were calculated with the Kruskal-Wallis test

Professional rating N total: C1: n=317; C2: n=373; C3: n=328

Patient rating N total: C1:158; C2:193; C3:170

Informal Caregiver rating N total: C1:94; C2:121; C3:104

[$] rated at admission skilled nursing facility (SNF)

[*] rated at discharge SNF

[#] rated 4 weeks after discharge SNF.

Table 4. *Care quality* at discharge skilled nursing facility (SNF) according to nursing staff and at 4 weeks follow-up according to patients and informal caregivers in percentage good and excellent. Selection of patients with completed professional data at baseline and not-died or having a readmission to hospital during their rehabilitation stay (n=1018).

	Responders	Cohort 1 March-June 2011		Cohort 2 Sept-Dec 2011		Cohort 3 March-June 2012		P for trend
		N	n (%)	N	n (%)	N	n (%)	
Professional rating								
Patient received sufficient information about care/treatment during rehabilitation (yes)	NS	267	259 (97)	347	344 (99.1)	304	302 (99.3)	0.03
Informal caregiver received sufficient information about care/ treatment during rehabilitation (yes)	NS	267	251(94)	347	331 (95.4)	304	292 (96.1)	0.51
Patients / Informal Caregivers rating								
Rating total care pathway (0-10 scale)[a] mean (sd)	P	155	7.3 (1.2)	190	7.31 (1.3)	166	7.3 (1.2)	0.88[#]
	IC	91	7.1 (1.3)	121	7.1 (1.3)	104	7 (1.3)	0.96[#]
Care/treatment during the hospital stay	P	157	125 (79.6)	190	155 (81.6)	167	131 (78.4)	0.76
	IC	92	66 (71.7)	120	83 (69.2)	104	76 (73.1)	0.81
Care/treatment during the rehabilitation stay	P	155	118 (76.1)	186	142 (76.3)	168	130 (77.4)	0.96
	IC	88	59 (67)	115	73 (63.5)	98	74 (70.5)	0.56
Care/treatment received in the current home situation	P	131	99 (75.6)	156	118 (75.6)	136	106 (77.9)	0.87
	IC	82	56 (68.3)	106	70 (66)	90	68 (75.6)	0.33
Information received from the professionals during rehabilitation	P	139	84 (60.4)	179	108 (60.3)	158	94 (59.5)	0.98
	IC	82	38 (46.3)	106	56 (52.8)	93	48 (51.6)	0.66
Appropriate referring from hospital to SNF (yes)	P	145	126 (86.9)	172	151 (87.8)	156	138 (88.5)	0.92
	IC	85	77 (90.6)	111	104 (93.7)	95	87 (91.6)	0.71
Sufficient possibilities to exercise individually (yes)	P	154	108 (70.1)	188	136 (72.3)	169	120 (71)	0.90
	IC	89	74 (83.1)	120	92 (76.7)	102	77 (75.5)	0.39

SNF: Skilled Nursing Facility; NS: Nursing Staff; P: Patient; IC: Informal Caregiver. Values are numbers (% good and excellent) unless indicated otherwise. P for trend values calculated with the Kruskal-Wallis test;

Professional rating N total: C1: n=317; C2: n=373; C3: n=328

Patient rating N total: C1:158; C2:193; C3:170

Informal Caregiver rating N total: C1:94; C2:121; C3:104

[#] One-Way ANOVA

[a] 10 indicating excellent

Quality of care (Table 4)

Professionals

According to the nursing staff, patients (p trend= 0.03) and informal caregivers (p trend=0.51) received sufficient information about care and treatment during rehabilitation.

The percentage of patients receiving more (or more intensive) treatment (≥ 4 hours/week) increased, as reported by the elderly care physicians (p trend <0.01).

Only longer treatment periods (i.e. more treatment time during each session) decreased from 11% in cohort 1 to 2% in cohort 3 (p trend <0.01). The amount of group therapy increased between the cohorts from 13% in cohort 1 to 30% in cohort 3 (p trend <0.01). According to the physical therapists, a low percentage of patients (overall 13.9%: p trend=0.71) performed individual exercise without the supervision of a physical therapist; in contrast, the nursing staff reported that 68% of the patients performed daily individual exercise. Also, there was more physical activity at the rehabilitation ward under the supervision of the nursing staff (p trend=0.01).

Patients and informal caregivers

Overall, patients and informal caregivers rated the total care pathway as 7.3 (SD 1.3) on a 0-10 scale (with 10 indicating excellent). The level of satisfaction did not differ between the cohorts. In total, 390 (77%) patients and 201 (67%) informal caregivers rated the care and treatment during rehabilitation stay as good or excellent.

In total, 286 (60%) patients and 142 (51%) informal caregivers reported the received information from professionals to be 'good' or 'excellent'. Also, 415 (88%) patients and 268 (92%) informal caregivers reported that the patient was referred in a proper manner from hospital to skilled nursing facility for rehabilitation, with no change over the cohorts.

Overall 71% (n=364) of the patients and 78% (n=243) of the informal caregivers reported that there was enough (or more than enough) possibility to perform individual exercise at the rehabilitation ward without supervision of a physical therapist; this did not differ between the cohorts.

DISCUSSION

This study evaluated the perceptions of professionals, patients and informal caregivers related to the quality of health service delivery in geriatric rehabilitation during implementation of a national programme aimed at improving quality of geriatric rehabilitation in the Netherlands. The study underlines that geriatric rehabilitation is a multidisciplinary process aiming to achieve integrated patient-centered care.[3]

Professionals reported small but positive effects on several items of health service delivery, mainly on the domain team cooperation. Within the domains alignment with patients needs, care coordination and care quality, less changes were reported. In cohort 1, the perception of the quality of the service delivery was already high, indicating that professionals were largely satisfied with the service they provided. Our results also show positive patient and informal caregiver perceptions on the quality of geriatric rehabilitation service delivery. The level of satisfaction of patients and informal caregivers did not change during implementation of the programme. An explanation for this may be that patient satisfaction is related to service delivery and is based on expectations and personal interactions, rather than on the quality of technical competence.[21]

Our results are in line with the national integrated care pilot in the UK[13] in which improvements appeared on a process level, but had limited effects on patient satisfaction. However, after implementation of quality improvements, a longer period of evaluation may be needed to reveal changes in service delivery as experienced by patients and informal caregivers[9]. It is a worldwide challenge to initiate, develop and evaluate integrated care on a large scale with multiple health care providers involved in a changing health care economy, also called 'complex adaptive systems' or 'complex interventions'[22-24]. These systems are complex because of the dynamics within the different health care providers and the large number of components that interact when developing integrated care delivery[13, 22, 23, 25, 26]. Another explanation may be that the national project had too optimistic expectations about the capacity of the organisations to execute a successful change themselves. Although there was central monitoring of the goals and progress next to exchange of experiences between organisations, little was done on education and coaching of effective ways of change management in these complicated integrated care processes.

Strengths and limitations

One strength of this study is the use of multiple data sources, including the patient, informal caregiver and three core professionals (elderly care physicians, physiotherapists and nursing staff) to gain a broad perspective on the perceptions of health care delivery in skilled nursing facilities. Also, the study has a high response rate from the professionals.

The present study can been seen as having a type of active participatory research design. To achieve good adaptation in a real-world setting, an active research design has several advantages[13, 22]. Development, implementation and evaluation were combined to develop tailor-made integrated care. The developments covered the different aspects of health care delivery and all stakeholders were committed to improve the quality of care. The collaboration between hospitals, skilled nursing facilities, homecare, health insurance companies and the government resulted in a process to innovate and ex-

change knowledge. This national programme stimulated the self-organising capacity of the participants, and resulted in a national movement of development in skilled nursing facilities.

The study also has some limitations. First, the process outcomes of the professionals were based on self-rating, which may have led to more social desirable answers. However, quality outcomes were also based on rating by patients and informal caregivers, who were not aware of the changes. Second is that the ratings of the process and outcomes of professionals, patients and informal caregivers were already high at baseline, leaving little room for improvement (ceiling effect). Third is that the Dutch Ministry of Health may have selected relatively good quality geriatric rehabilitation service organisations, whereas a selection based on relatively poor performance by means of quality indicators might leave more room for improvement. Finally, within this study we were particularly interested to explore the changes in the health service delivery process experienced by professionals, patients and informal caregivers. Other factors depending on organisational characteristics of the skilled nursing facilities would be of interest for further research, since these characteristics could influence the expected level of change as well[12]. However, this was outside the scope of our study.

This study reports on a national programme to improve integrated care in geriatric rehabilitation. Professionals, informal caregivers and patients reported some and small improvements in the care process. Effective change in complex integrated care processes and the measurement of the effects on process outcomes remains a challenge.

CONCLUSION

This national programme to improve quality of care in geriatric rehabilitation resulted in small improvements in team cooperation, as reported by the professionals. However, no effects were found for patients' and informal caregivers' perceptions on health service delivery. These results may suggest that changes in organisational structure need time to penetrate to the outcome level of patients and informal caregivers

Acknowledgments

The authors thank the organisations and staff of the skilled nursing facilities that participated in this study.

Funding

This study was funded by a grant from the Dutch Ministry of Health and *Het Kwaliteitsinstituut*: grant numbers 320506 and 89-89100-98-304, respectively. No conflicts of interest or financial disclosures are declared by any author of this study.

REVIEWERS

John Gladman, Professor of the Medicine of Older People, Division of Rehabilitation and Ageing, School of Medicine & MRC/Arthritis Research UK Centre for Musculoskeletal Ageing Research, University of Nottingham, UK

Ngaire Kerse, PhD, MBChB, FRNZCGP, Professor and Head of School of Population Health, Faculty of Medical and Health Sciences, University of Auckland, New Zealand

REFERENCES

1. Holstege MS, Zekveld IG, Caljouw MA, et al. Relationship of Patient Volume and Service Concentration With Outcome in Geriatric Rehabilitation. *J Am Med Dir Assoc*2013; 14(10):731-735.
2. Boston Working Group on Improving Health care Outcomes Through Geriatric Rehabilitation. Med Care 1997;35(6 Suppl):JS4-20.
3. Levenson SA. Past as prologue: applying enduring evidence to improve rehabilitative care. *J Am Med Dir Assoc* 2013;14(10):715-716.
4. Chen LM, Ayanian JZ. Care continuity and care coordination: what counts? *JAMA Intern Med* 2014;174(5):749-750.
5. Ackerly DC, Grabowski DC. Post-acute care reform--beyond the ACA. *N Engl J Med* 2014;370(8):689-691.
6. Mechanic R. Post-acute care--the next frontier for controlling Medicare spending. *N Engl J Med* 2014;370(8):692-694.
7. Bodenheimer T. Coordinating care--a perilous journey through the health care system. *N Engl J Med* 2008;358(10):1064-1071.
8. Kergoat MJ, Latour J, Lebel P,et al. quality-of-care processes in geriatric assessment units: principles, practice, and outcomes. *J Am Med Dir Assoc* 2012;13(5):459-463.
9. Mastellos N, Gunn L, Harris M,et al. Assessing patients' experience of integrated care: a survey of patient views in the North West London Integrated Care Pilot. *Int J Integr Care* 2014;14:e015.
10. Baillie L, Gallini A, Corser R,et al. Care transitions for frail, older people from acute hospital wards within an integrated healthcare system in England: a qualitative case study. *Int J Integr Care* 2014;14:e009.
11. Mirzaei M, Aspin C, Essue B, et al. A patient-centred approach to health service delivery: improving health outcomes for people with chronic illness. *BMC Health Serv Res* 2013;13:251.
12. Hartgerink JM, Cramm JM, van Wijngaarden JD, et al. A framework for understanding outcomes of integrated care programmes for the hospitalised elderly. *Int J Integr Care* 2013;13:e047.
13. Greaves F, Pappas Y, Bardsley M, et al. Evaluation of complex integrated care programmes: the approach in North West London. *Int J Integr Care* 2013;13:e006.
14. Langley G.J. The improvement guide: A practical approach to enhancing organisational performance (1st ed.). 1st ed. San Francisco: Jossey-Bass Publishers. 1996.
15. Bolscher A, Fonk H. Procesmonitor Proeftuin Geriatrische Revalidatie eindmeting [process-monitor national programme geriatric rehabilitation] 2012. [In Dutch]
16. Achterberg WP, Schols J, Hertogh C et al. Leidraad geriatrische revalidatiezorg [Guidebook geriatric rehabilitation]. Consortium Geriatrische Revalidatie LUMC/VUmc/MUMC, 2013 [In Dutch] https://www.lumc.nl/sub/9600/att/1090174/Leidraad-Geriatrische-Revalidatie-2013 (last accessed november 2015)
17. Grone O, Garcia-Barbero M. Integrated care: a position paper of the WHO European Office for Integrated Health Care Services. *Int J Integr Care* 2001;1:e21.
18. Schrijvers G, van Hoorn A, Huiskes N. The care pathway: concepts and theories: an introduction. *Int J Integr Care* 2012;12(Spec Ed Integrated Care Pathways):e192.
19. Vanhaecht K, De WK, Depreitere R, et al. Development and validation of a care process self-evaluation tool. *Health Serv Manage Res* 2007;20(3):189-202.
20. Mahoney FI, Bathel DW. Functional evaluation: The Barthel Index. *Md State Med J* 1965;14:61-65.
21. Kupfer JM, Bond EU. Patient satisfaction and patient-centered care: necessary but not equal. *J Am Med Dir Assoc* 2012;308(2):139-140.

22. Tsasis P, Evans JM, Owen S. Reframing the challenges to integrated care: a complex-adaptive systems perspective. *Int J Integr Care* 2012;12:e190.
23. Sturmberg JP, O'Halloran DM, Martin CM. Understanding health system reform - a complex adaptive systems perspective. *J Eval Clin Pract* 2012;18(1):202-208.
24. Peters DH, Adam T, Alonge O, et al. Implementation research: what it is and how to do it. *The BMJ* 2013;347:f6753.
25. Harris M, Greaves F, Gunn L, et al.. Multidisciplinary group performance-measuring integration intensity in the context of the North West London Integrated Care Pilot. *Int J Integr Care* 2013;13:e001.
26. Fleuren M, Wiefferink K, Paulussen T. Determinants of innovation within health care organisations: literature review and Delphi study. *Int J Qual Health Care* 2004;16(2):107-123.