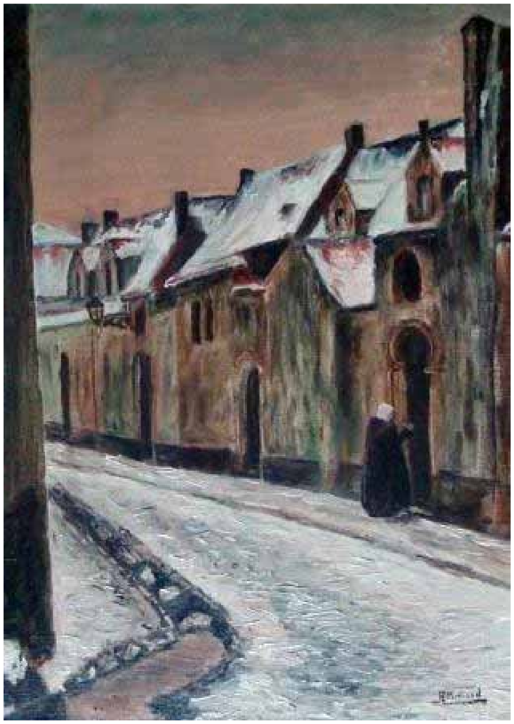
Hospital discharge: Problems and interventions



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Cover: ***“Visspaanstraat, Brugge”***, 1933 by Roger Mistiaen
Word processing: Herma van den Brink
Printing: Twin Design BV, Culemborg

HOSPITAL DISCHARGE: PROBLEMS AND INTERVENTIONS

PROEFSCHRIFT

ter verkrijging van de graad van doctor aan de Universiteit Maastricht,
op gezag van de Rector Magnificus, Prof. Mr. G.P.M.F. Mols
volgens het besluit van het College van Decanen,
in het openbaar te verdedigen
op donderdag 25 oktober 2007 om 12.00 uur

door

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Introduction

Background

Problems after hospital discharge are not new, nor are they exclusively Dutch. Nationally and internationally, there is a long history of research about (post) discharge problems. The oldest reference in Pubmed that can be found with “Discharge planning” in the title dates from 1960 (Spicer and Gysin, 1960). Until January 2007 more than 700 references can be found in Pubmed with discharge planning in the title; 5 publications date from the sixties, 63 from the ‘70s, 239 from the ‘80s, 251 from the ‘90s and already 159 from the first 7 years of this millennium. It appears therefore that discharge planning is an area that attracts much research attention internationally. Hospital discharge has not only attracted research attention but it has also remained a problematic area, as is demonstrated by following anecdotal quotes.

	National	**International**
1970		*45% of the discharged patients needed either practical assistance of one kind or another, or information and advice. 19% needed the former and were not getting it and 26% were needing the latter and not receiving it.* (Skeet, 1970)
1990	*Governmental policy of the last decade has led to shorter hospital stays. The assumption that discharged patients receive no or insufficient aftercare, although needed, was confirmed by our data: on average 23% of the patients who claimed they needed assistance, did not get either professional or informal care.* (Kerkstra *et al.*, 1990)	
1991		*Many articles on transition from hospital to home still read like catalogues of disaster.* (Armitage, 1991)
1997	*Hospital stays are becoming shorter and shorter. The research center primary/secondary care of the Vrije Universiteit hospital conducted research on the problems that elderly patients face after discharge home from hospital. [..] The main conclusion is that discharged patients feel insufficiently informed: 80% of the patients said one week after discharge that they lacked information. Furthermore, half of the patients experienced difficulty in personal care activities, 75% had mobility problems and 80% perceived difficulty in performimg household activities in the first week after discharge.* (Warmels, 1997)	

Continued

	National	**International**
2001	*Results showed that continuity of care was poor as only 36% of the district nurses were informed about patients' pain by hospital nurses* (de Wit and van Dam, 2001)	
2002		*Despite 30 years of research attention, discharge planning and district nurse referral remain problematic.* (Wilson *et al.*, 2002)
2005		*Evidence that both quality and patient safety are jeopardized for patients undergoing transitions across care settings continues to expand.* (Coleman *et al.*, 2005)
2006	*'Aftercare of hospital patients is badly organized'. The problems vary from not getting the indicated home care to not having information and instruction about the needed therapy at home or about what to do in emergency situations. One in three of the discharged patients has not been told what to do in case of emergency or in what circumstances they need to contact their general practitioner. Some patients did not get any instructions at all. Almost all patients (96%) consider it of utmost importance that they are clearly told what to do or not to do after discharge from hospital.* (Inspectie voor de Gezondheidszorg, 2006)	
2007		*It can be concluded that older people experience a wide variety of difficulty managing aspects of their own care on discharge from hospital following assessment by the public health nurse. [..] This study supports the findings of other studies of the problems after discharge elsewhere in the world and to studies carried out in the 1970s, 80s and 90s.* (McKeown, 2007)

Changes in society and in health care surround and probably influence these post discharge problems, such as the governmental policy, hospital capacity and length of stay, technological developments and demographic changes. These are now discussed in brief from a Dutch perspective.

Demographic changes

The average age of the Dutch population is steadily increasing. There is a relatively large increase in the number of (old) elderly, who are the main consumers of hospital health care and community care services. In 1972, one out of 7 hospitalized patients was 65 years or older; in 1986 the ratio was 1 to 4, and the estimated ratio for 2010 is 1 to 2 (Lems, 1990). The focus of health care for the elderly is largely on chronic conditions, involving frequent episodes of acute health care and the resulting transitions between health care levels and providers (Kempen, 2003).

Social trends

Modern society is becoming more individualistic, and more people are living alone (Ekamper *et al.*, 2003). In particular there is a growing population of widowed elderly. There are fewer informal caregivers available, and people are forced to seek professional care. Furthermore, people want to be more involved in their own health care decisions. In the Netherlands there is a general desire to stay at home as long as possible and to be discharged from hospital as soon as possible (Dokter *et al.*, 1996; Le Grand-van den Bogaard, 1997).

Hospital capacity and length of stay

After a rise in hospital capacity during the fifties and sixties, in more recent decades hospital bed capacity in the Netherlands decreased from about 74,500 in 1975 to about 56,500 in 1995 and about 51,500 in 2006 (Stichting Informatie Gezondheidszorg, 1996; Deuning, 2006). Along with this and probably due to technological improvements (Sloan and Valvona, 1986), the mean length of stay in a general hospital in the Netherlands dropped from 16.1 days in 1975 to 12.5 days in 1985, to 9.5 days in 1995 and 4.1 days in 2005. This means that more patients are now treated for shorter periods and patients are being discharged from hospital quicker. However, there are no Dutch data to underpin that ‘quicker’ also means ‘sicker’, as was demonstrated in the USA (Kosecoff *et al.*, 1990).

Technological developments

The shorter hospital admissions are also a result of the development of new and less invasive technologies for diagnostic and surgical procedures. Many technologies, which in the past could only safely be applied in the hospital setting, have become available for use in the home care environment

(Richter *et al.*, 2003; Hollestelle *et al.*, 2005). Moreover, the introduction of new technologies, procedures and treatment modalities contribute to the increased survival of patients. As a consequence, there is a shift in focus from acute to chronic health problems, on the one hand, and from cure to care on the other (Delnoij *et al.*, 2002).

Dutch Governmental policy

The consumption and costs of health care in the Netherlands have increased rapidly from 3.2% of the gross national income in 1953 to 7.9% in 1974 and 9.2% in 2004 (Ministerie van VWS, 2006). In order to control this increasing expenditure, the Dutch government developed a new health care system in 1974 (Tweede Kamer der Staten Generaal, 1974). The structure of that new system defined two levels: general care at home (primary health care) which was clearly separated from specialized care in hospitals (secondary health care). The general practitioner had a central role in this system, being the gatekeeper for entrance to specialized care in health care institutions.

However, in the eighties several disadvantages of this system became apparent (Boot *et al.*, 1983; Spreeuwenberg *et al.*, 2000). The two different levels of care grew worlds apart and patients did not experience continuity of care. Consequently, in the late eighties several new initiatives to reorganise the health care system were developed (Tweede Kamer der Staten Generaal, 1986; Commissie structuur en financiering gezondheidszorg, 1987; Ministerie van WVC, 1990; Tweede Kamer der Staten Generaal, 1991; Commissie modernisering curatieve zorg, 1994). Common objectives were to ensure continuity of care for patients, to foster co-operation between health care providers and organisations and to encourage home care. To promote the implementation of these new ideas the government offered incentives to all parties involved in health care (Ministerie van WVC, 1989; Ministerie van WVC, 1991).

Changes in the health care system are still in progress such as a recent complete new system of health care funding (Tweede Kamer der Staten Generaal, 2005) and mergers between health care institutions to form mega-consortiums, in a sector and across sectors (CBS, 2005). Also new reforms are anticipated in the coming years, as is demonstrated by a recent discussion paper of the Dutch Ministry of Health Care (Ministerie van VWS, 2007).

Innovations in health care organization

Government policy reforms have led to a variety of initiatives, including projects that tried to improve the transition from hospital to home and/or the problems after discharge. Some examples are: continuity visits of home health care nurses for cancer patients after discharge from hospital (Harteveld *et al.*, 1995), liaison nurses (Peters, 1995), hospital care at home for patients who are dependent on medical technology (van Bilsen and Dukkers van Emden, 1995), transmural clinics (Temmink, 2000), cross-boundary pharmacy (Brouwers, 1997), discharge preparation and after-care by clinical nurse specialists (Jaarsma, 1999), telephone follow-up by ward nurses after discharge (Boter *et al.*, 1998), nursing outpatient clinics (Mistiaen, 1998) and hospital-based convalescent wards (Oomen, 1996).

To ensure optimal continuity of care for patients during and after transitions between health care settings it is essential that caregivers have accurate data about the type of problems patients encounter during these transitional periods. It is also essential that they have a clear understanding of the relevant factors that influence these transitional problems. Based on this information (new) interventions can be developed with the aim to prevent or reduce the problems encountered during or after hospital discharge.

Research questions and objective

The aim of this study is to provide health care providers with data which will enable them to improve care for patients during and after transition from the hospital to the home environment. The following main research questions have been formulated for this study:

- *What kind of problems do patients encounter after discharge from hospital? And what factors influence these problems?*

- *Can patients with post discharge problems be identified at admission?*

- *What is the effectiveness of 'discharge interventions', with special attention to the effects of telephone-follow up?*

The study is confined to adult, often elderly, patients who have been discharged home from an acute somatic care hospital. The empirical section of the research is limited to patients discharged from nine different nursing wards of two hospitals in Amsterdam.

Outline of the study

The study consists of three parts. The first part is an exploration of the literature concerning problems after discharge and relevant determinants. The findings of the literature search are summarized in a tentative theoretical framework.

The second part consists of four empirical studies. Chapter 2 presents an empirical study in which problems after discharge are measured in a population of elderly discharged from an university hospital in Amsterdam.

In the third chapter, a comparison is made regarding health status and functional problems between elderly who were recently discharged from hospital and elderly who were not.

The fourth chapter contains a study in which the predictive validity of a risk-screening instrument was tested, with the purpose of identifying patients with a high risk on post-discharge problems soon after hospital admission.

After these descriptive and correlational studies, an intervention trial is presented in Chapter 5. In this trial the effectiveness of a telephone follow-up after discharge in ophthalmic surgery patients was studied. The study, however, did not show the expected effect. Therefore, it was decided to go back to the literature in a systematic way.

This exercise resulted in Part 3, which contains two systematic reviews. Chapter 6 consists of a systematic review of the international literature about the effectiveness of hospital based telephone follow-up interventions.

The final chapter is a systematic review of reviews (a meta-review) concerning the effectiveness of different kinds of discharge interventions.

The thesis ends with a discussion and conclusion section in which recommendations for practice and future research are made.

This PhD thesis is somewhat different from most others. It is different in the fact that the publications in the various chapters cover a period of ten years, which is quite unusual. It is also different in that it contains three literature reviews, one at the beginning and two at the end.

But these special features give the readers the chance to see how the subject of the thesis evolved over the years, without losing its importance, as was shown in the quotes in the beginning of the introduction.

Furthermore, the ten-year period of publications gives the readers an opportunity to see how the methodology for conducting literature reviews evolved from narrative to more systematic, scientific approaches.

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Part 1

Exploration of the literature on post-discharge problems and discharge planning

Chapter 1:

The construction of a research model on post-discharge problems based on a review of the literature 1990-1995

1 The construction of a research model on post-discharge problems based on a review of the literature 1990-1995

Mistiaen P, Duijnhouwer E, Ettema T: **The construction of a research model on post-discharge problems based on a review of the literature 1990-1995.** *Soc Work Health Care, 1999,* ***29****: 33-68*

Abstract

Based on a review of the research literature on post-discharge problems published between 1990-1995, a model is constructed for future research. Hereto a two-step theory synthesis method was used. Main problematic areas after discharge are a decreased functional, health, emotional and social status. Limitations or problems in these areas are influenced by patient-related and care-related factors and by the social network of the patient. Both, outcome areas after discharge and the different influencing factors seem to be strongly interrelated. Some studies show favourable results from discharge planning activities. However, there is a great lack of empirical and controlled research.

Keywords: discharge planning, literature review, theoretical model

1.1. Introduction

The continuity of care for patients across the boundaries of various health care institutions and care services is becoming increasingly important, due to a general decrease in the duration of hospitalization and the increasing number of transitions (chronic) patients make between these institutions and care services. In order to anticipate problems which occur after discharge and to develop or optimize systems of cross-boundary care, a deeper understanding of the nature of these problems, and of the underlying factors and determinants, is essential. Although the results of previous studies[88,89,90,91,92,93] have demonstrated that patients encounter various problems after discharge from hospital, and other studies[94,95,96] have reported on the effects of cross-boundary care on patient outcomes, there is still no comprehensive empirically-based model explaining the occurrence of post-discharge problems which could form the basis for interventions to facilitate the transition process.

The objective of this study is therefore to construct a theoretical model, based on so-called theory synthesis. Theory synthesis builds on empirical evidence that is derived from various sources, such as field observations or research reports[97]. This theory synthesis will focus on the problems patients encounter after discharge from hospital, defined as the troubles, worries, limitations, concerns, inconveniences or difficulties that patients experience or present in the first 2 months after discharge from hospital.

This literature review will answer the following research question: *which post-discharge problems have been addressed in the published research articles, and what are the factors which influence these problems? The* aim of the study is to construct a conceptual model which could form the basis for empirical research.

1.2. Methods

For this literature review the method of theory synthesis[97] is followed. The basic process underlying theory synthesis is induction, in which is reasoned from particular facts to generalizations. The first step in the development is to formulate a general framework of relevant concepts. The framework subsequently is validated by the collection of empirical data. The two-step process of constructing a framework and validating it on the basis of

additional data is also followed in this literature review. Hereto, the selected studies were classified in qualitative and quantitative studies. The results of publications using qualitative research methods were used to formulate a general scheme for post-discharge problems. Subsequently, this scheme was then refined, validated and supplemented with data from the results of quantitative studies, resulting in the construction of a theoretical framework.
The choice for this approach is based on the concept that the evaluation and analysis of the transition process should be based on the perspective of the patient. An inductive research method guarantees optimal objectivity and understanding of post-discharge problems from the perspective of the patient.
Two computerized databases, MEDLINE and PSYCHLIT, were used for the literature search. These comprehensive databases contain medical, nursing and general social-scientific publications, and cover over 3000 journals. The databases were searched by means of the December 1995 update of the CD-ROM versions available at the Vrije Universiteit in Amsterdam. Both databases were screened for a combination of the major subject headings 'Patient discharge' <u>or</u> 'Continuity of patient care' <u>or</u> 'Aftercare' and confined to the "Human" area. Selection and analysis of the publications was carried out by two (nurse) researchers. Reference Manager, QuattroPro-Windows and SPSS-Windows were used for data-management and analysis.
The search was limited to the period 1990-1995, and confined to journal publications, because this is the most accepted format to reveal scientific research and because journals have a high degree of topicality. The search was further confined to articles published in the English or Dutch language; English, because it is the most common language in the international field of health care, and Dutch, because it was also of interest to identify specific problems in the country in which the study was performed. The final limitation of the search was that only references accompanied by an abstract in the computerized databases were selected, since titles often contain insufficient information to determine whether or not the article meets the inclusion criteria. The titles and abstracts of the selected references were then screened on the basis of the following inclusion criteria:

- it concerns results of primary research
- the results concern the status of patients at home after discharge
- the study population involved adult patients who had been admitted to an acute care hospital for diagnostic purposes or therapy for a primarily somatic disease

- the patient outcomes were related to the first 2 months after discharge
- the patients had a minimum of 1 overnight stay in the hospital.

For all the references that met the inclusion criteria, the complete article was ordered via the normal international library order-system. If the complete articles were received within 6 months of ordering, they were screened again, now based on the full text, to determine if they still met the inclusion criteria. This provided a final set for analysis and synthesis.

From each article included in the final set, the following data were gathered: type of research (quantitative, qualitative), design, population characteristics, research variables (outcomes and influencing factors), research instruments, measurement points, results and conclusions. Statistical analysis was confined to descriptive measures; no attempt was made to pool results as is done in quantitative meta-analysis.

1.3. Results

Four aspects of the results will be presented, starting with the general results of the search method and a description of the general characteristics of the selected publications. This will be followed by a discussion of the studies that used a qualitative research method and a preliminary framework is presented. In the third part, the results of the studies using a quantitative approach and which are not experimental studies, are described within the context of the preliminary framework. Finally, the results of the quantitative intervention studies are presented.

General results

The literature search based on the afore mentioned major subject headings resulted in 1440 references of which 1197 concerned articles published in the English (n=1185) or Dutch (N=12) language. For 770 (763 in English and 7 in Dutch) of these articles, an abstract was included in the databases, so they were retained, and the other 427 references without abstract were excluded from the study. Comparison of the title and the abstract resulted in a further 615 references being excluded because they did not meet the inclusion criteria. A copy of the complete article was ordered for the remaining 155 references, which were all published in the English language. These complete articles were then checked again to determine whether they still met the inclusion criteria for analysis. One article was not obtained within 6 months, and 67 publications did not meet the inclusion criteria. So, this resulted in a total of 87 publications to be included in the final analysis (Table 1.1).

Table 1.1 Results of CD-ROM search of MEDLINE & PSYCHLIT

	Number of references	
Major subject headings search	1440	
English or Dutch	1197	(Dutch 12)
Abstract in database	770	(Dutch 7)
Inclusion criteria met (based on title & abstract) and ordered	155	(Dutch 0)
Received within 6 months	154	
Inclusion criteria met (based on full text) and data analyzed	87	

The articles were published in 61 different journals, Age & Ageing and the Journal of the American Geriatric Society being the most relevant with 4 publications found in each. Most publications were from USA-origin (55%), followed by the UK (21%) and Canada (8%); the other 16% originated from 8 other countries. The size of the study population varied from 4 to 28953 participants with a mean of 1062; 44 (50.5%) studies had a study population of over 100 patients, and in 16% there were more than 500. 55% of the studies concerned patient populations with mixed medical diagnoses. The research approach was qualitative in 8 studies and quantitative (outcomes and influencing factors expressed numerically) in the other 79; 30 publications concerned intervention research (Table 1.2).

Table 1.2 General characteristics of the final set of publications selected for analysis (n=87)

		number
Year of publication	1990	5
	1991	7
	1992	23
	1993	14
	1994	29
	1995	9
Journal (61 different ones)	Age & Ageing	4
	J. American Geriatric Society	4
	Applied Nursing Research	3
	J. Advanced Nursing	3
	J. Public Health Medicine	3
	Rehabilitation Nursing	3
	other:	10 x 2 44 x 1
Country of origin (11 different ones)	USA	48
	UK	18
	Canada	7
	Australia	3
	Sweden	3
	Israel	2
	New-Zealand	2
	Denmark	1
	Germany	1
	Netherlands	1
	Switzerland	1
Diagnostic groups	mixed	48
	coronary heart failure	8
	hip fractures or hip -surgery	8
	solid tumors	4
	cerebrovascular	3
	eye surgery	1
	asthma	1
	periferal vascular bypass	1
	burns of feet	1
	gynecological surgery	1
	sectio cesarea	1
	hernia inguinalis surgery	1
	prostatectomy	1
	not mentioned	7
Research approach	qualitative	8
	quantitative without intervention	49
	quantitative intervention-research	30
Population size (patients) (mean 1062, range 4-28953)	unknown	1
	10 or less	3
	11-50	19
	51-100	20
	101-500	30
	501-1000	5
	1001-5000	6
	more than 5000	3

Qualitative studies

Sample characteristics

All the qualitative studies selected concerned elderly populations, with sample sizes varying from 4 to 25 (Table 1.3). Three studies were based on a specific medical diagnostic group. All studies made use of (open) interview techniques, sometimes combined with observation and content analysis of patient charts. Most of the measurements took place approximately 2 weeks after discharge with one exception which was 90 days after discharge.

Table 1.3 General characteristics of the qualitative studies

reference	n	age range	diagnostic group	measurement mode	measurement moments after discharge
Bull, 1994a [10]	25	68-90	mixed	interview	10-15 days
Congdon, 1994 [19]	8	75-95	hip fracture	interview observation	on discharge 7-10 days
Jewell, 1993 [39]	4	elderly	not mentioned	interview status analysis	14 days
Klop, 1991 [46]	11	>60	not mentioned	interview	90 days
McWilliam, 1992 [58]	12	68-84	mixed	interview observation status analysis	10 days
McWilliam, 1994 [59]	21	68-84	mixed	interview observation status analysis	15 days
Moore, 1994 [60]	20	51-76	coronary bypass	interview	on discharge 2 days 21 days
Wiffin, 1995 [81]	7	not mentioned	hip surgery	interview status analysis	14 days

Problem areas

Table 1.4 gives an overview of the problems patients experience after discharge, insofar as these were mentioned during the post-discharge interviews.

Table 1.4 Problems after discharge experienced by patients, mentioned in the qualitative studies

reference	problem
Bull, 1994a [10]	- insufficiently informed - feeling uncertain - difficulty with and needing assistance with activities of daily life - insufficient help and access to community services - insufficient recovery - being readmitted - dissatisfaction with hospital and discharge procedures
Congdon, 1994 [19]	- difficulty with activities of daily life - insufficient help with activities of daily life
Jewell, 1993 [39]	- insufficiently informed - difficulty with activities of daily life - insufficient/inadequate help
Klop, 1991 [46]	- patients are not aware of the communication between carers about them, but they don't consider it as a problem
McWilliam, 1992 [58]	- insufficiently informed - difficulty with activities of daily life - difficulty with prescriptions - emotional complaints (loneliness, apathy, dependence, anxiety) - insufficient emotional and physical support - being readmitted
McWilliam, 1994 [59]	- insufficiently informed - insufficient help - physical complaints - being readmitted
Moore, 1994 [60]	- difficulty with activities of daily life - physical complaints (tiredness, sleep disturbances, coughing, pain,...) - negative feelings (depression, fear, anxiety, concerns...) - insufficiently informed - financial problems - dependence on others
Wiffin, 1995 [81]	- insufficiently informed - inadequate and insufficient home care - inadequate provision of aids

Bull[10] found as problem areas that patients felt insufficiently informed (not fully informed, received contradictory information or they did not understand the information), felt uncertain, had difficulty in performing normal daily activities, had insufficient help and access to community services, felt insufficiently recovered, were dissatisfied with the hospital care and the discharge procedures, and were sometimes readmitted. Congdong[19] focussed on the discharge process itself. However, the interviews held on discharge and 7-10 days after discharge revealed that patients had problems in performing normal daily living activities, and that they felt that they received insufficient support in this respect. Based on home interviews with patients and family carers, Jewell[39] found that patients felt insufficiently informed about their prescriptions for medication and diet, that their mobility was limited, that they had difficulty in performing daily activities such as personal care and housekeeping, and that they received inadequate or insufficient support. Klop et al.[46] studied the discharge process from a legislative perspective, and found that patients were not aware of the communication between the carers in different echelons, but that they did not consider this to be a problem. A double study by McWilliam[58] and McWilliam en Sangster[59] (one in a rural and one in an urbanized area) reported that patients felt insufficiently informed after discharge, had difficulty in performing the activities of daily living, had difficulty with prescriptions, medication or the administration of oxygen, had emotional problems such as feelings of loneliness, apathy, dependence and anxiety, had physical complaints, did not receive sufficient emotional and physical support, and sometimes had to be readmitted. In her study, Moore[60] questioned patients about the concerns, emotions and physical limitations they experienced in the first 3 weeks after discharge. She found that patients experienced fatigue, incision pain, coughing, sleep disturbances, muscle pain, depressive feelings, anxiety, concern, irritation, emotional disturbances and sadness. Patients also felt concerned about the extent to which they could function independently, were afraid they were going to faint or were concerned about their incision when showering. Patients felt uncomfortable because they were dependent on others and found it hard to still be treated as a patient during the recovery period. They also had informational needs, in particular about when the rehabilitation programme would be initiated or when they would be able to return to work. Some patients experienced financial problems. This study also revealed that the wordings patients used to describe their experiences after discharge did not match the wordings that were used in the information leaflets, they received. Finally, Wiffin[81] identified problems such as informational needs, insufficient and inadequate home help and inadequate provision of aids.

Influencing factors

Factors that could be of influence on the various post-discharge problems, found in these qualitative studies, are shown in Table 1.5.

Table 1.5 Factors influencing problems after discharge, mentioned in the qualitative studies

reference	**influencing factor**
Bull, 1994a[10]	- quality of discharge planning; this is determined by an effective, comprehensive, timely and correct communication between caregivers in and across institutions and between caregivers and the patient and his family. Good communication on turn is determined by the time available, the professional experience of the caregiver and the age and educational level of the patient - availability of formal and informal care after discharge - access to formal care, which, in turn, is determined by the financial position and insurance coverage of the patient - physical capability of the patient to take care for himself - amount of information giving during admission
Congdon, 1994 [19]	- diversity between caregivers, patient and family in the perception of discharge readiness - availability, willingness and skill of family to assist the patient with daily activities and to provide emotional support; this, in turn, is determined by the extent to which caregivers support the family in this respect - the extent to which patient and family were involved in procedures/decisionmaking in discharge planning - lack of coordination, management, role clarity & anonimity in the multidisciplinary approach of patient care & discharge planning, which leads to lack of clarity, fragmentization and ineffective communication - coping and adaptation capability of the patient
Jewell, 1993[39]	- discharge planning (time of initiation, history taking, multi-disciplinary approach,...) - (non)involvement of patient and family in decisionmaking - information giving - involvement of community care givers - role and attitude of staff - communication between hospital and community staff and between staff and patients

Table 1.5 *Continued*

reference	influencing factor
Klop, 1991[46]	//
McWilliam, 1992[58]	- 'the patient mindset', which includes someone's philosophy of life, attitude toward aging, attitude toward self and one's own care, level of psychological dependence, and deference toward caregiver authority. - physical capability of patient to take care of himself - intellectual and mental ability of the patient to solve problems - extent, availability, skill and willingness of the family to help and support - deference to caregivers - quality of the (written and oral) communication and coordination between caregivers in and across institutions - roleconfusion of the discharge planner - discharge preparation, information giving en skills training of the patient and his family

McWilliam, 1994[59]	- urban versus rural areas:
	  - in rural settings, hospitals and community care are organized differently than in urban areas
	  - in rural settings there is less pressure on beds, so longer hospital stays are possible; there is a different professional atmosphere, less bureaucracy, less specialization, and less anonimity
	  - in rural hospitals there is more clarity on who is responsible for discharge planning
	  - in rural areas there is more social responsibility to care for each other
	- ineffective communication and coordination between caregivers and patients
	- availability and acces of doctors and health care services
	- quality discharge planning and instruction

Moore, 1994[60]	- stress due to the required coping with problems after discharge - gender - wordings of caregivers and information leaflets - quality discharge planning, namely exact clear information on what feelings and symptoms one can expect after discharge and how to act
Wiffin, 1995[81]	- quality of documentation in discharge planning - involvement of patient and family - deficit in informing patients about the period after discharge - availability of and acces to community care services - initiatives of patient self to search for solutions

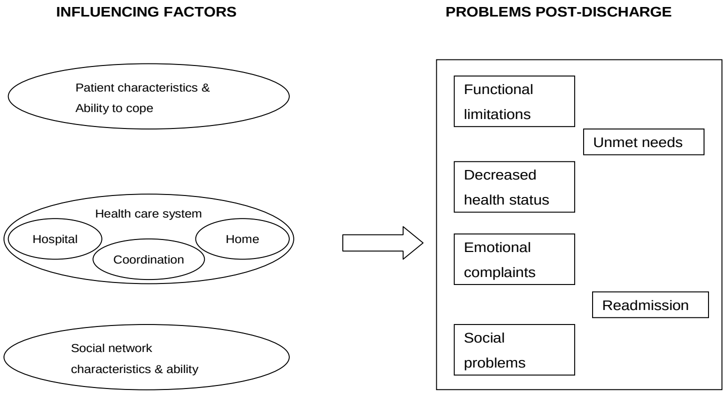
Bull[10] reported that 'effective communication' is the most important factor with regard to the quality of discharge planning, and thus in the prevention of post-discharge problems. However, effective communication concerning the discharge preparation is dependent on the time available for the carers, their professional experience and the relationship that has been built up between patient and caregiver. She considers it important that, on admission to hospital, patients are asked about their abilities and limitations, the home environment, the availability and ability of family carers, and the preferences of the patient and family with regard to aftercare; vice versa it is important that patients ask questions, for example about medication and regimes. Furthermore, she reported a tendency for younger patients and patients with a higher level of education to ask more questions. Other factors influencing the post-discharge course, according to Bull, are the financial position of the patient with regard to payment for community care services and the support that is provided by the informal network. Congdon[19] found that patient, caregivers and family differ in their judgment about the discharge readiness. Even professional caregivers differ from each other in their clinical judgement of the discharge readiness, which can be affected by too many staff changes and ineffective communication. Furthermore, she found that family support is a major determinant for the discharge destination; it was also found that professional carers mainly support the patient, and not the family in the discharge preparation. The post-discharge course is strongly influenced by support from the family, in forms of their presence, supporting the patient in the activities of daily living, or organizing professional assistance when needed. The support provided by the family is, in turn, influenced by the stress and the problems experienced by members of the family themselves. Congdon also found that the patient and the family are seldom involved in the discussions and decisions of professional caregivers with regard to the options for aftercare. Finally, she found that professionals tend to favour a team approach towards discharge planning with no single person responsible for the final decision. The major determinant for post-discharge problems, according to Jewell[39], is inadequate communication between caregivers (within and between institutions) and between caregivers and patients. McWilliam[58] and McWilliam & Sangster[59] consider that the degree to which the post- discharge period can be labelled as (un)succesful, depends on the ‘patient’s mind set’ (philosophy of life, attitude towards ageing and dependence, way of coping, etc.), on the reaction of caregivers within the family, and on the quality of the discharge planning in the hospital. This last variable is determined by the effectiveness of communication between caregivers, and also between caregivers, patient and family. Finally, differences between rural and urban areas were also found. Moore[60] suggests that feelings of discomfort may be influenced by the stress associated with adjusting to the home situation. She also suggests that a discharge preparation which involves detailed descriptions of recovery experiences using words which former patients were using, might help the patients to adjust more quickly to normal life and to reduce their anxiety. Wiffin[81] reports that the documentation of discharge planning is of poor quality, that patients have passive roles in the hospital environment and are poorly informed. Moreover, she found that there was inadequate provision and availability of community services. Patients have to rely on their own initiative to obtain the necessary services after discharge.

Preliminary framework

The qualitative studies demonstrate that patients encounter various types of post-discharge problems. These problems can be related to a *decreased functional status* (difficulty in performing the activities of daily life, and/or need of assistance with these activities). Other problems are related to a *decline in health status* (physical complaints and feeling insufficiently recovery). A third problem area for patients is a *disturbed emotional status* (feeling insufficiently informed or uncertain, negative feelings and emotional worries). The *social functioning* of patients can also give rise to problems (being dependent on others, financial problems). In all these four areas patients might experience insufficient or inadequate support in coping with the difficulties or limitations involved (*unmet needs*), which can sometimes result in *readmission*.

Furthermore, the qualitative studies provide evidence that problems after discharge are influenced by many factors. These influencing factors can be categorized as health care- related factors, patient-related factors and factors related to the social network of patients. Examples of *health care-related factors* are the extent to which and the way in which the patient and the family are prepared for discharge and the post-discharge period, the extent to which and the way in which home care is provided, and the extent to which hospital and home care are inter-related. Most studies indicate that insufficient preparation is made in hospitals to enable patients to cope with the problems after discharge. According to the qualitative studies, a central influencing factor or determinant of the development and the severity of post-discharge problems is the quality of the discharge planning process. In this respect, effective communication between carers, and also between carers, patient and family, is crucial. *Patient-related factors* are demographic characteristics, such as age, gender, disease characteristics, the physical and emotional ability of the patient to cope with problems, and changes in self-care. Finally, *factors related to the social network* are the availability, the skill and the willingness of the social network to provide support and/or help for the patient. However, none of the qualitative studies have drawn clear conclusions as to the exact mechanisms which underly these problems, or which factors influence them, but it can be assumed that the various influencing factors also influence each other, as well as the post-discharge problems, separately and collectively. Based on these qualitative studies, a preliminary framework (Figure 1.1) was constructed for use in the analysis of the quantitative studies.

Figure 1.1 Preliminary framework on problems post-discharge



Quantitative non-intervention studies

Sample characteristics

The size of the study populations in the quantitative non-intervention studies varied from 18 to 28953, but most had a population ranging between 50 and 300. In general, the study populations involved elderly people, and most of them concerned mixed diagnostic groups. Measurement points varied between 7 and 365 days after discharge, the majority taking place within the first month after discharge. Interviews and questionnaires were the methods most frequently used, sometimes supplemented by chart review and hospital database analysis. The characteristics of these 49 studies are presented in Table 1.6.

Table 1.6 General characteristics of the quantitative non-intervention studies

reference	**n**	**age range**	**diagnostic group**	**measurement mode**	**measurement moments after discharge**
Blaylock, 1992, [2]	206	16-85	mixed	unclear	60 days
Bostrom, 1994, [4]	89	mean 54	mixed	questionnaire telephone interview	14 days
Boyle, 1992, [6]	150	adults	mixed	questionnaire	within 120 days
Brandreit, 1991, [7]	32	elderly	not mentioned	questionnaire semi-structured interviews	7-28 days
Brown, 1995, [9]	135	65-94	mixed	chart review tel. interview	within 7 days
Bull, 1994b, [11]	185	55-97	mixed	interview	14 days
Burns J., 1992, [12]	56	65-98	not mentioned	unclear	after 5th day
Burns R., 1992, [13]	2504	mean 78	mixed	chart review interviews	6 weeks
Chadiha, 1995, [15]	208	65+	heart failure	tel. & home interviews	2 weeks
Chambers, 1990, [16]	356	mean 76	mixed	interview	3 & 12 months
Cochrane, 1992, [18]	50	mean 77	not mentioned	structured home interview	6-14 days
Corr, 1992, [20]	49	41-95	CVA	structured home interview	6-12 months

Table 1.6 *Continued*

reference	**n**	**age range**	**diagnostic group**	**measurement mode**	**measurement moments after discharge**
Czarn, 1992, [22]	2016	25-64	myocardin-farct	postal survey	1-6 years
Daffurn, 1994, [23]	54	mean 51	mixed	physical exam. semi-structured interview	3 months
Egan, 1992, [24]	61	65-92	hipfracture	tel. interview	21 days
Friedman B, 1992 [26]	46	adults	mixed	chart review tel. interview	3.5-20 months
Friedman P, 1990 [27]	342	mean 75	CVA	clinical observation interviews caregiver	7, 30, 60, 90, 120, & 180 days
Galloway, 1995, [28]	32	34-84	periferal bypass	interviews	first follow-up at OPD
Given, 1994, [30]	196	mean 78	mixed	tel. interview caregivers	2 weeks & 3 months
Haddock, 1991, [32]	80	70-96	mixed	tel. interview	2 & 4 weeks
Hanger, 1993, [34]	94	60-95	not mentioned	interview	3 months
Huber, 1992, [36]	28953	adults	mixed	analysis hospital database	during 0-30 days
Ibach, 1995, [38]	48	29-86	mixed	chart review	6 months
Johansson, 1994, [40]	53	66-96	mixed	interview	30 days
Jones, 1994, [41]	960	65-98	mixed	postal questionnaire	3 months
Jopp, 1993, [42]	47	60-90	mixed	chart review tel. interview	30 days
Kerr, 1993, [44]	59	adults	mixed	chart review tel. interview	30 & 90 days

Table 1.6 *Continued*

reference	**n**	**age range**	**diagnostic group**	**measurement mode**	**measurement moments after discharge**
Kiefe, 1993, [45]	195	14-94	mixed	chart review (tel.) interview	30 days
Kruse, 1992, [48]	18	65-93	heart disease	electr. monitoring interview	during 21 days 21 days
Lockery, 1994, [50]	264	mean 75	mixed	interview	30 days
Mackenzie, 1993, [51]	19	45-85	heart ischemia	interview	28-42 days
Mahoney, 1994, [52]	214	mean 78	mixed	questionnaire interview	30 days
Mamon, 1992, [53]	919	60+	mixed	questionnaire tel. interview chart review	14 & 90 days
Mark, 1991, [54]	580	48-63	myocardinfarct	phys. examination	30 days
McBride, 1995, [56]	60	elderly	not mentioned	questionnaire interview chart review	not mentioned
North, 1991, [63]	62	adults	mixed	tel. interview	14 days
O'Hare, 1993, [65]	63	adults	solid tumor	interview questionnaire	30 days
Oktay, 1992, [66]	1077	60+	mixed	tel. interview	14 & 90 days
Schaefer, 1990, [70]	25	65-86	mixed	questionnaire	10-12 days
Simchen, 1992, [72]	2846	adults	hernia inguinalis	clinical observ. tel. interview	10 & 20 & 30 days
Solomon, 1993, [73]	226	mean 79	mixed	interview chart review	14 days
Tierney, 1994, [77]	238	75+	mixed	chart review questionnaire (tel.) interview	14 & 42 & 90 days

Table 1.6 *Continued*

reference	n	age range	diagnostic group	measurement mode	measurement moments after discharge
Weddle, 1991, [78]	185	mean 63	mixed	analysis hospital database chart review	1 year
Wei, 1995, [79]	20136	mean 75	mixed	secondary data-analysis	30 days
Weigelt, 1992, [80]	16453	adults	mixed	clinical assessment chart review	30-60 days
Williams E., 1992, [82]	470	75+	mixed	home interviews	14-21 days
Williams M., 1994a, [84]	120	mean 80	hip fracture	interview chart review	2, 8, 14 weeks
Williams M., 1994b, [85]	120	60+	hip fracture	interview	2, 8, 14 weeks & 6 months
Williams T., 1994 [86]	75	13-67	asthma	diary questionnaires	during 2 weeks 2 months

Problem areas

Table 1.7 presents the type of problems reported in the various quantitative studies. Due to the great variety in operationalization of the concepts, diagnostic groups, and measurement points, no comparisons can be made across the studies concerning the incidence and extent of the post-discharge problems patients experience.

Health status. Sixteen of these studies measured some aspect of health status after discharge, using terms such as 'physical health'[11], 'wound infection'[72,80], 'general well-being'[16], 'mortality'[16], 'general health state'[23], 'health status'[26,82], 'symptom distress'[28,65], 'pulmonary embolism'[36], 'functional health state'[40], 'physical symptoms'[51], 'falls'[52], 'coronary complications'[54] and 'medical complications'[63].

Table 1.7 Post-discharge problems per dimensions in quantitative non-intervention studies

dimension	references	number of references
health status	11, 16, 23, 26, 28, 36, 40, 51, 52, 54, 63, 65, 72, 80, 82, 86	16
functional status	11, 12, 13, 16, 20, 24, 27, 30, 34, 40, 42, 44, 45, 48, 51, 52, 53, 63, 65, 66, 70, 73, 77, 82, 84, 85	26
emotional status	4, 6, 7, 9, 16, 18, 22, 23, 26, 28, 32, 38, 41, 51, 56, 63, 77, 82, 84, 85	20
social status	16, 20, 22, 23, 34, 51, 53, 63, 66	9
unmet needs	15, 32, 44, 53, 65, 66	6
readmission	2, 11, 16, 36, 50, 53, 73, 77, 78, 79, 86	11

Functional status. Functional limitations after discharge are included in 26 quantitative studies, referred to as: 'ability to perform ADL'[11,13], 'having difficulty with medication containers'[12], 'physical functioning'[16], 'functional status'[20], 'independence in ADL'[24], 'functional state'[27], 'limitations in ADL, IADL functioning and need for assistance with medical tasks'[30], 'adaptive aids and equipment need'[34], 'needs assistance in personal care/social/domestic/shopping/... activities'[40], etc. These concepts are measured by '(in)ability to perform...' or 'experienced trouble with...' or 'extent of needed assistance with...' the activities of daily living as bathing, taking care of yourself, going to the bathroom, etc., or with the instrumental activities of daily life, such as preparing meals, cleaning, shopping, etc., or with mobility as moving around the house, going for a walk, travelling, getting in and out bed, walking up stairs, etc. Many different measurement instruments were used, both standardised and self-developed, and also many different answering structures.

Emotional status. Twenty studies reported outcomes related to emotional status, referred to as 'psycho-social well-being'[3], 'powerlessness'[7], 'anxiety'[8,28], 'emotional problems'[23], 'mood state'[29,84], etc. One specific aspect in the emotional category is the feeling of being insufficiently informed. This is mentioned in 10 of the 49 quantitative non-intervention studies. Terms used for this aspect are: 'informational needs'[1,56,67,77], 'being (un)aware of'[7,59], 'misunderstanding'[8], etc. Other outcomes with regard to the emotional status are (dis)satisfaction with hospital and home care [56,63,73] and the (in)ability to cope with (unexpected) discharge destinations other than the home.

Social status. Problems related to social functioning are mentioned in 9 publications with a quantitative approach, referred to as 'social functioning'[16,68], 'social problems'[35,47], 'role enactment'[51] and 'return to work'[31]. Here, too, there is a great variation in operationalization, and there is also an overlap with outcomes of emotional status, e.g 'psycho-social capability'[87].

Unmet needs. Apart from the various afore- mentioned post-discharge problems patients are faced with, 6 publications reported an additional dimension of 'unmet needs', indicating that when a problem is encountered it can result in a need for help that is not (adequately) met. Mamon et al.[53], who studied over 900 patients with mixed diagnoses, discharged from five different hospitals, reported that 97% of the patients had one or more 'needs' and that 33% of the patients had unmet needs.

Readmission as an outcome was found in 10 publications in this group. The frequency of readmission varied between 13%[11] and 46%[16].

Influencing factors

The qualitative studies showed that problems after discharge are influenced by care-related factors, patient-related factors and by factors related to the social network of the patient. Influencing factors from all three dimensions are also found in this group of quantitative non-intervention studies (Table 1.8).

Table 1.8 Factors influencing post discharge problems found in the quantitative non-intervention studies

category	**elements & references**	**n**
Patient-related influencing factors	demographic:	
	age 2 6 9 11 13 15 16 23 27 28 38 40 52 53 65 66 77 79 82	19
	gender 6 11 13 15 16 23 27 38 40 42 44 45 50 52 53 65 73 79 82	19
	ethnicity/race 15 38 44 45 53 72 79	7
	living situation 2 13 15 16 30 40 45 52 56 77	10
	marital status 15 16 45 50 56	5
	educational level 11 56 73	3
	language 42	1
	functional status pre-admission/during admission/at discharge ((I)ADL-capability, mobility, energy, self care agency, use of assistive devices..) 2 9 11 13 23 27 40 42 50 51 52 56 73 79 82 84 85	17
	health status pre-admission/during admission/at discharge (medications, previous admissions, diagnoses, comorbidity, chronic conditions, severity of illness, treatment, consciousness, behavior pattern, sensory deficits, type of wound, physical symptoms, confusion, procedures, complications, type of admission, malnourishment, substance abuse, obesitas, surgery type, ...) 2 6 9 11 13 15 16 23 24 26 27 40 42 44 45 51 52 53 54 56 66 70 72 79 80 84 85	27
	emotional status pre-admission/during admission/at discharge (mental status, depression, mood, knowledge, ...) 24 50 51 70 84	5
	social status pre-admission/during admission/at discharge (insurance, income, employment, roleloss, role-enactment, socio-economic status,...) 11 15 23 24 38 44 45 50 51 53 56 66	12
social network related	social support/support system/social climate 9 24 40 50 53 73	6
	employment of caregiver 30	1
	relationship between patient and caregiver 30	1
	living situation of caregiver 36	1
	presence/availability of informal caregiver 53 66 70	3
care related factors	length of stay 6 11 16 23 26 52 53 80	8
	discharge planning (amount, structure, time...) 6 32 44 53 66	5
	patient involvement in decisionmaking/discharge planning 7 50 52 66	4
	provided education 53	1
	type/number of carers/disciplines 53	1
	involvement of social work/dietician in discharge planning 66 78	2
	discharge placement 50 85	2
	community resources 70	1
	ward structure and processes 77	1
other	legislation 34	1

Patient-related factors. Most studies use one or more demographic patient characteristics as possible factors which influence the outcome variables. Most frequently used are age and gender; others are the patient's living situation, marital status, ethnicity and educational level. In addition to these 'classic' variables, many studies use some kind of 'patient status' before discharge as possible determinant for the status after discharge: e.g., 17 studies use the functional level, either before admission, during admission or immediately before discharge, as an influencing factor; health status before and during admission is very frequently used, as well as emotional and social status before and during admission. All these concepts are operationalized in many different ways and the points and modes of measurement also differ greatly from one study to another.

Social network- related factors. Ten studies measured influencing factors related to the social network, mainly with regard to the extent or availability of the social support system.

Care-related variables that have been measured in this group of studies are characteristics of the discharge planning, in terms of amount, structure and time, the involvement of the patient in discharge planning and decisions, and the involvement of various disciplines and caregivers in the care and discharge planning. Structures and processes within a ward are also considered to be possible influencing factors. A frequent subject of research is the relationship between the length of hospital stay and problems after discharge.

Finally, societal factors, such as political decision-making[43] and legal regulations[34], have also been suggested as possible influencing factors.

Quantitative intervention studies

Sample characteristics

Of the 79 quantitative studies selected, 30 were classified as intervention studies. Their general characteristics are presented in Table 1.9.

Table 1.9 General characteristics quantitative intervention studies

reference	con-trol	age range	diagnostic group	n exp.	n cont.	measurement mode	measurement moments after discharge
Bean, 1995 [1]		adults	mixed	503		tel. interview	2, 30 days
Boman, 1993 [3]	yes	mean 60	breast CA	28	90	questionnaire	2 weeks, 1 year
Bowman, 1994 [5]		19-88	mixed	85		tel. interview	7-10 days
Broughton, 1995 [8]		n.m.	bowel CA	100		interview	4-6 weeks
Byrne, 1994 [14]	yes	adults	mixed	1745	1721	clinical exam. questionnaire	6 weeks
Closson, 1994 [17]		adults	mixed	105		tel. interview	2, 3 weeks
Counsell, 1994 [21]		n.m.	neurological	33		questionnaire	5 weeks
Evans, 1993 [25]	yes	mean 67	mixed	417	418	chart review interview	1 month
Gilliss, 1993 [29]	yes	25-75	cardiac	75	81	tel. interview questionnaire	1, 4, 8, 12, 24 weeks
Grube, 1992 [31]		1-72	burns	92		chart review	1 month
Haddock, 1994 [33]	yes	65+	mixed	29	35	tel. interview	2, 4 weeks
Hansen, 1992 [35]	yes	75+	mixed	163	181	hospital database clinical assessment	1 day, 2 weeks, 1 year
Hulton, 1992 [37]	yes	adults	cesarean section	500	500	questionnaire	6 weeks
Kenny, 1991 [43]	yes	adults	mixed	121	118	postal questionnaire	4 weeks

Table 1.9 *Continued*

reference	**con-trol**	**age range**	**diagnostic group**	**n exp.**	**n cont.**	**measurement mode**	**measurement moments after discharge**
Kravitz, 1994 [47]		65+	mixed	152		clinical assessment interviews chart review	1-3 days
Lichtenstein, 1993 [49]		mean 69	orthopedic	249		tel. interview postal questionnaire	2, 6, 12 months
Martin, 1994 [55]	yes	mean 82	mixed	29	25	hospital database questionnaire	6, 12 weeks, 1 year
McCorkle, 1994 [57]	yes	adults	CA	49	11	questionnaire interview	1-30 days, 90 days
Naylor, 1994 [61]	yes	mean 75	cardiac	140	136	hospital database	2, 6, 12 weeks
Ng, 1994 [62]		18-72	gynecological	40		interview	2 weeks
O'Cathain, 1994 [64]	yes	mean 77	orthopedic	76	34	hospital database interview	few days, 3 months
Orticio, 1992 [67]		n.m.	opthalmic	1258		tel. interview	1-2 days
Pain, 1990 [68]	yes	adults	CVA	21	15	questionnaire interview	3 months
Rhoads, 1992 [69]		n.m.	cancer	n.m.		chart review interview	2 weeks
Schneider, 1993 [71]	yes	43-94	cardiac	28	26	hospital database	1 month
Soskolne, 1993 [74]	yes	mean 68	mixed	78	76	tel. interview chart review	3 weeks, 2 months
Spear, 1994 [75]	yes	51-89	urologic	47	50	chart review	unclear
Styrborn, 1994 [76]		mean 80	mixed	36		open interviews questionnaire chart review	1 month

Table 1.9 *Continued*

reference	con-trol	age range	diagnostic group	n exp.	n cont.	measurement mode	measurement moments after discharge
Williams, E., 1992 [83]	yes	75+	mixed	231	39	home questionnaire	15-20, 30, 60, 90, 150, 210, 300, 360 days
Wong, 1990 [87]	yes	mean 65	orthopedic	50 & 48	8	clinical exam questionnaire	2, 6 weeks

The size of the experimental groups varied between 21 and 1745. The study population in 13 studies concerned mixed diagnostic groups. Measurements mainly took place during the first month after discharge; questionnaires and interviews were the most frequently used research methods. 18 studies included a control group, either actual or historical, and 7 of these studies [25, 29,55,61,68,83,87] were based on a true experimental design involving pre-test measurements, randomization over experimental and control groups and (several) post-measurements

Problem areas

All aspects of the problems mentioned in the qualitative studies are also found in the intervention studies, either as an outcome or as mediating variable (Table 1.10).

Table 1.10 Post discharge problems per dimension in intervention studies

dimension	references	n
health status	3, 5, 8, 14, 17, 31, 37, 47, 49, 57, 62, 64, 67, 74, 75, 76, 83	16
functional status	3, 5, 8, 17, 29, 31, 47, 49, 55, 57, 68, 74, 76, 83, 87	15
emotional status	1, 3, 5, 8, 17, 21, 29, 33, 47, 55, 57, 67, 69, 74, 76, 83, 87	17
social status	3, 5, 8, 17, 31, 35, 47, 57, 68, 87	10
unmet needs	5, 33, 43, 57, 69, 76	6
readmissions	1, 8, 25, 33, 35, 55, 61, 64, 71, 74, 75	11
total		30

Health status after discharge was measured in 16 of the intervention studies in many different ways, such as the patient's perception of physical symptoms[3], wound infection[14], medical problems[47], symptom distress[57], pain relief[62], perceived health[64], ocular discomfort[67], emergency room visits[74], etc. *Functional status* as a post-discharge outcome was measured in 15 studies. Examples of aspects of functional status are: practical difficulties after discharge[3], self care deficits[17], behavior performance[29], physical mobility[64], functional ability[68], etc. *Emotional status* was measured in 17 intervention studies, referred to as psycho-social wellbeing[3], mood state[29], self esteem[61], informational needs[83], etc. *Social status* as outcome or mediating variable was found in 10 studies. *Unmet needs*, in one or more areas, were measured in 6 studies; *readmission* was measured in 11 studies.

Influencing factors

Intervention studies mainly focus, of course, on the influence of the intervention on the outcomes, although to some extent confounding and mediating variables are measured as well. Therefore, the description of the influencing factors in this group of studies is limited to the relationship between the intervention and the outcomes. The post-discharge problems that are used as outcome of the intervention are presented in more detail in Table 1.11, together with a description of the intervention itself.

Table 1.11 Intervention modes and outcomes in the quantitative intervention studies

reference	**intervention**	**outcomes**
Bean, 1995 [1]	"continuum of care project" . establishment of network between health care providers . telephone follow-up . home visit of home health agency after discharge	unplanned readmissions interdisciplinary communication meeting patient care needs
Boman, 1993 [3]	voluntary early discharge	patient's perceptions of - physical symptoms - psycho-social well being (including informational needs) - practical difficulties after discharge
Bowman, 1994 [5]	telephone follow-up	health problems social problems

Table 1.11 *Continued*

reference	intervention	outcomes
Broughton, 1995 [8]	informal discussion with patients at the OPD	understanding of diagnosis & treatment health status psychological worries
Byrne, 1994 [14]	whole body desinfection	wound infection post discharge
Closson, 1994 [17]	telephone follow-up	(potential) self care deficits (medication, safety, ADL, bowel & bladder, skin, nutrition, home health management, community integration,...)
Counsell, 1994 [21]	"a coordinated care model" . patient care coordinator . multidisciplinary critical paths	length of stay costs patient satisfaction with communication, information
Evans, 1993 [25]	risk screening & early discharge planning	succesfull return home health care use readmission length of stay
Gilliss, 1993 [29]	"psycho-educational nursing intervention" . supplemental in-hospital education . frequent telephone follow-up	self-efficacy expectations behavior performance quality of life mood state
Grube, 1992 [31]	agressive surgical treatment & early ambulation	graft take return to work
Haddock, 1994 [33]	"structured discharge planning program using collaboration between a clinical nurse specialist and a social worker"	patient satisfaction length of stay readmissions unmet needs/inadequate provision of services
Hansen, 1992 [35]	post discharge home-visits by district nurse	nursing home placement days in institution readmission additional care needed medication adjustment social problems
Hulton, 1992 [37]	post discharge surveillance	infectious complications

Table 1.11 *Continued*

reference	intervention	outcomes
Kenny, 1991 [43]	change in medication discharge policy	continuity of medication
Kravitz, 1994 [47]	. post discharge home assessment & follow-up by a gerontologic nurse practitioner . multidisciplinary team meetings	medical problems functional problems medication problems social problems problems in understanding follow-up instructions
Lichtenstein, 1993 [49]	"hospital based education program" . preoperative education session . discussion with previous patients . hospital based support group after discharge	patient satisfaction with the program health status functional level compliance with recommendations & follow-up visits
Martin, 1994 [55]	home treatment team	readmissions days at home functional ability mental status
McCorkle, 1994 [57]	home care services	symptom distress mental health status social dependency health perceptions
Naylor, 1994 [61]	"comprehensive discharge planning protocol" . gerontologic nurse specialist . hospital visits . discharge visit . telephone follow-up after discharge	length of stay costs readmission functional status mental status health perception self esteem affect emergency room visits
Ng, 1994 [62]	early discharge home visit district nurse telephone follow-up	pain relief postoperative complications
O'Cathain, 1994 [64]	"hospital at home" . early discharge . liaison nurse . hospital at home team	satisfaction with care perceived health (physical mobility, emotional status, social functioning, pain, energy, sleep) readmission length of stay costs

Table 1.11 *Continued*

reference	**intervention**	**outcomes**
Orticio, 1992 [67]	telephone follow-up	general condition ocular discomfort availability of help questions/concerns
Pain, 1990 [68]	individualized booklet	independence/functional ability social functioning
Rhoads, 1992 [69]	risk screening discharge planning program discharge planning team	unmet needs knowledge of medication
Schneider, 1993 [71]	medication discharge planning program	readmissions
Soskolne, 1993 [74]	early & comprehensive discharge planning training social workers	functional level readmissions emergency room visits psycho-social problems
Spear, 1994 [75]	early discharge	medical complications readmissions emergency room visits telephone calls of patients
Styrborn, 1994 [76]	interdisciplinary comprehensive discharge planning	functional level medical condition psychological concerns unmet needs
Williams, E., 1992 [83]	time tabled visiting after discharge	health status physical status disability level mental status unmet needs informational needs
Wong, 1990 [87]	discharge planning program . in-hospital instruction . home visits by community nurse early discharge	functional capability psycho-social well-being knowledge compliant behavior discharge readiness

Most interventions concern care-related factors. Applied interventions are in general: the use of special functionaries [21,47,49,86], such as clinical nurse specialists and liaison nurses, telephone follow-up [1,5,17,29,67], home visits[,35,55,83], intensive after care [8,37,62,64], early discharge[3,62,64,75], structured discharge planning systems[25,33,61,69,74,76] and the provision of additional information and further education[29,49,68,87]. Some interventions are applied mainly during the hospital admission in order to prevent problems after discharge, others are applied mainly after discharge to identify and solve (in an early phase) problems that may have risen; sometimes combinations of pre- and post-discharge interventions are used. A number of interventions concern the patients themselves and others are directed towards the family carers in ways of giving emotional support, teaching skills, or assisting them with organizing and co-ordinating the various care services. Interventions can also be directed towards the professional carers, by constructing effective organizational structures, developing care protocols, or creating possibilities for expert consultation. More detailed information about the cause-effect relationships found in the controlled studies are shown in Table 1.12, wherein the true experimental studies are shaded.

Table 1.12 Results of controlled intervention studies

reference	**intervention**	**results**
Boman, 1993 [3]	voluntary early discharge	- perceptions of experimental patients did not differ about physical symptoms or psycho-social well being - experimental group had more practical difficulties after discharge due to drain (getting dressed, personal care, lying in bed,..)
Byrne, 1994 [14]	whole body desinfection	wound infection rate post discharge did not differ between groups
Evans, 1993 [25]	risk screening & early discharge planning	exp. group more frequently discharged home ex. group spent fewer days in nursing home after discharge ex. group had fewer readmissions in 1st month after discharge lenght of stay during readmissions was shorter in exp. group lenght of initial hospital stay shorter in exp. group exp. group used more services and counseling after discharge

Table 1.12 *Continued*

reference	**intervention**	**results**
Gilliss, 1993 [29]	"psycho-educational nursing intervention" . supplemental in-hospital education . frequent telephone follow-up	exp. group had higher self-efficacy in walking no differences found in behavior performance, quality of life, or mood state
Haddock, 1994 [33]	"structured discharge planning program using collaboration between a clinical nurse specialist and a social worker"	exp. group more satisfied with discharge process exp. group had less readmissions exp. group had fewer unmet needs
Hansen, 1992 [35]	post discharge home-visits by district nurse	exp. group had less nursing home placement exp. group had less institutional days no differences found in hospital readmission rates or in mortality
Hulton, 1992 [37]	post discharge surveillance	(adequacy of) infection rate increased
Kenny, 1991 [43]	change in medication discharge policy	after change more patients had problems with continuity of medication
Martin, 1994 [55]	home treatment team	exp. group was less frequently readmitted exp. group spent more days at home no differences were found in functional ability or mental status
McCorkle, 1994 [57]	home care services	exp. group had more improvement in mental health and social dependency no difference found in symptom distress or in health perceptions
Naylor, 1994 [61]	"comprehensive discharge planning protocol" . gerontologic nurse specialist . hospital visits . discharge visit . telephone follow-up after discharge	some of the ex. group (medical DRG's) were less frequently readmitted, had less hospital days during readmissions, and had less costs no differences found in functional status, mental status, health perception, self esteem, affect, length of initial hospital stay and emergency room visits

Table 1.12 *Continued*

reference	**intervention**	**results**
Pain, 1990 [68]	individualized booklet	no differences found in independence/functional ability, or social functioning
Schneider, 1993 [71]	medication discharge planning program	less readmissions in exp. group
Soskolne, 1993 [74]	early & comprehensive discharge planning training social workers	no differences in readmissions, functional level, psycho-social problems exp. group more emergency room visits exp. group less satisfied with post-hospital health services
Spear, 1994 [75]	early discharge	no differences in medical complications, readmissions, emergency room visits or telephone calls of patients
Williams, E., 1992 [83]	time tabled visiting after discharge	no differences found in health status, physical status, disability level, mental status, unmet needs or informational needs
Wong, 1990 [87]	discharge planning program . in-hospital instruction . home visits by community nurse early discharge	functional capability higher in 1 exp. group exp. groups were more discharge ready no differences found for psycho-social well-being, knowledge or compliant behavior

1.4. Discussion

The qualitative studies showed that patients experience various types of post-discharge problems and that these problems are influenced by several factors. The preliminary framework, constructed on the basis of data from these qualitative studies, appeared to be useful for the analysis of the quantitative studies. All aspects of the problems mentioned in the qualitative studies are also found in the studies with a quantitative approach. However, the quantitative non-intervention studies provided important additional information to the qualitative studies, since they not only addressed the physical complaints reported by patients, but also symptoms and signs observed by professionals, i.e. medical complications, such as infections, pulmonary embolism, cardiac problems, phlebitis or hematuria. The same problem areas were also found in the quantitative intervention studies, in which they are studied either as intervention outcomes or as mediating variables.

The preliminary framework also formed a useful background for investigating the influencing factors. Quantitative studies confirmed the different categories. However, a number of the post-discharge variables that are used in some studies as outcomes are used in others as influencing factors, and vice versa. This suggest that post-discharge problems are strongly inter-related, which is an important addition to the qualitative studies, implying that all outcomes are also mutual determinants. Furthermore, the quantitative studies demonstrated that the post-discharge status is influenced by functional, emotional, social and health status before and during hospitalization[11,51,73] and at discharge[16,24,27,52,73,76,78,84], and that the development of post-discharge limitations is partly dependent on the limitations which were present in the early post-discharge period[27,84,85]. Therefore, the preliminary framework has yet to be completed in this respect.

Although the various concepts of post-discharge problems have been measured in several studies, there is considerable variation in the operationalization of these concepts. The various studies also concern very different study populations. Therefore, the incidence and intensity of problems after discharge can only be illustrated but not compared. Thus, no definite conclusions can be drawn on the exact relationship between influencing factors and post-discharge problems.

With regard to the intervention studies, not all applied interventions were fully described in the articles. Furthermore, the concepts and terminology were sometimes unclear: for instance, what is meant by 'intensive after care' or 'discharge planning coordinator' or 'discharge planning system'. Sometimes single interventions are applied, but combinations are more common, so it is difficult to evaluate the effectiveness of the various elements. The relationships between influencing factors and outcomes also vary, in some studies no relationships are found, and the reports of other studies are contradictory: for instance, Bowman et al.[5], Galloway et al.[28] and

Boyle et al.[6] reported that women have more informational needs, while Brown[9] found that this was the case for men.

Nevertheless, from the data obtained from these studies a certain type of 'risk-profile' emerges: compared with men, *women* seem to have more symptom distress after discharge and feel less healthy[5,65,82], they are readmitted more often[50], have a worse functional status[24,82], a worse emotional status[82], worse social functioning[5], and also have more informational needs[5,6,28] and more unmet needs[53,65]. With regard to age, the *(oldest) elderly* have more symptom distress[65,82], less functional capability[8,47,82], more informational needs[6,9] and more unmet needs [53,65], a higher utilization of health care services and are discharged more often to a nursing home[13]. *Low social economic status* (well-fare dependent, low level of educational, low income, ethnic minorities, etc..) is related to more medical problems[65], more limitations in ADL[47], less social functioning[47], more unmet needs[15,53,65,69] and higher utilization of health care services[73]. *People living alone* seem to experience more medical problems, have more unmet needs[53,65] and are discharged more often to a nursing home[13]. In some studies it was found that problems after discharge are influenced by specific types of disease[1,16,51,65] (more often in chronic diseases) and also by the severity of illness[9 79].

In addition to patient characteristics, the characteristics of the informal carer have also been found to be determinants[49] of post-discharge problems: for instance, age of partner, care agency of partner, travelling distance between patient and family members, etc. These factors can be important determinants of the support a patient receives, and therefore for the resulting unmet needs.

Moreover, characteristics of the (hospital and community) care system, such as the availability, access and quality, also influence the post-discharge problems. An interesting finding in this respect is the relationship between post-discharge problems and the amount and quality of discharge planning in the hospital: if the structure or the co-ordination of the discharge planning is not optimal, patients have more medical problems[79], are readmitted more often[79], have more informational needs[6] and have more unmet needs[32,53,66].

Furthermore, patients who are not, or insufficiently involved in discharge planning, more often have ADL-problems and are more frequently discharged to a nursing home[50]. Brandreit[13] reported in her study that patients were not involved in the decision-making concerning discharge destination, but neither did they want to be. The type of hospital ward also seems to be an influencing factor: Boyle et al.[6] en Tierney et al.[77] found more informational needs in patients who were discharged from surgical wards.

With regard to the intervention studies, most studies reported positive conclusions on the effectiveness of the applied interventions. However, these findings must be interpreted with caution, since the population sizes in most studies were rather small. Furthermore, many studies made use of self-developed instruments, of which the psychometric properties and sensitivity are not well demonstrated, and only 7 studies used a true experimental design.

Finally, this literature review contains results from various countries and cultures, albeit a majority from the USA. Also, the articles concerned many different patient groups. This may limit the applicability of the framework to some settings.

1.5. Conclusion

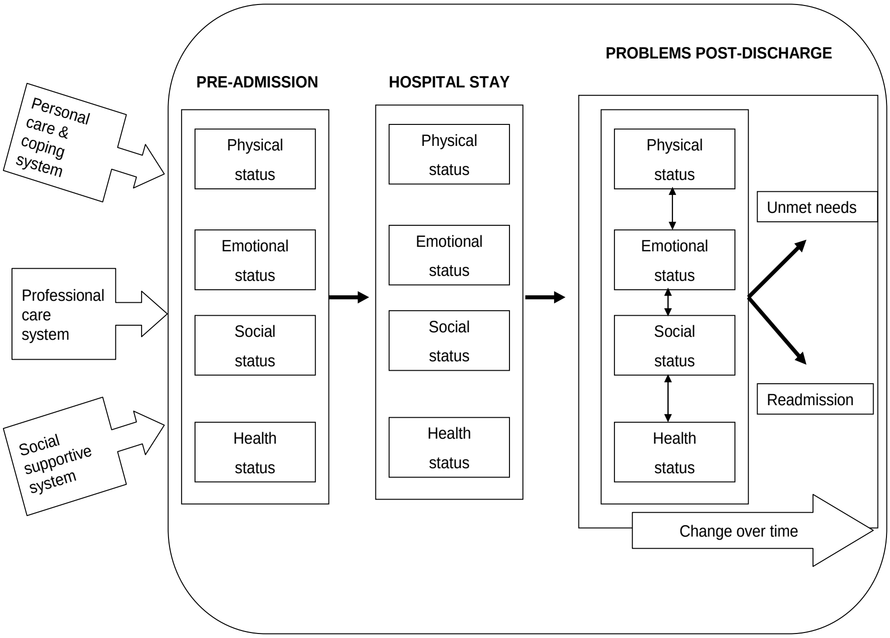
There are many aspects of post-discharge problems, and they are influenced by many factors. The literature search revealed no comprehensive theoretical framework for this extensive field of research. In answer to the research question underlying this literature review, i.e., 'which post-discharge problems after discharge have been addressed in the published research articles and what are the factors which influence these problems?', it can be stated that:

- patients may have post-discharge problems related to their functional status, health status, emotional status and social status. These aspects of the problems vary over time, are often accompanied by unmet needs and sometimes result in readmission;
- problems after discharge are influenced by many different factors. In general, the influencing factors can be categorized into patient-related factors, care-related factors and factors related to the social network of the patient;
- problems after discharge and the influencing factors are interrelated, in concept and over time.

Furthermore, the literature shows that post-discharge problems can be reduced by efficient discharge planning during hospitalization and by intensive after care, and that the risk of post-discharge problems can be predicted to some extent.

The theoretical framework which emerges from this literature study is shown in Figure 1.2. However, this model needs further empirical research to fully determine the relationships between the various post-discharge problem and the factors, which influence them.

Figure 1.2 Theoretical model on post-discharge problems



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Part 2
Empirical studies on post-discharge problems and discharge planning

Chapter 2:
The problems of elderly people at home one week after discharge from an acute care setting

Chapter 3:
Problems related to hospital discharge or age? A comparison of problems and care needs in two elderly populations

Chapter 4:
Predictive validity of the BRASS index in screening patients with post-discharge problems

Chapter 5:
A randomized trial of a Telephone Reassurance Programme for patients recently discharged from an ophthalmic unit

2

The problems of elderly people at home one week after discharge from an acute care setting

Mistiaen P, Duijnhouwer E, Wijkel D, de Bont M, Veeger A: **The problems of elderly people at home one week after discharge from an acute care setting.** *J Adv Nurs 1997, 25: 1233-1240*

Summary

The problems of elderly people following discharge from hospital is a worldwide focus of nursing attention. Actual and local insight into the nature and extent of post-discharge problems is needed as a base for improving and evaluating discharge planning. Problems following discharge were investigated as the first part of a larger study.

Over a 3-month period, 251 elderly people who had been discharged after a hospital stay of more than 3 days, were asked to participate in the study. Half received a postal questionnaire and half were interviewed at home, one week after discharge. There were 145 respondents.

The need for information was mentioned by 80% of the patients. Housekeeping tasks also caused most patients some difficulty. Almost 40% of those discharged reported some kind of unmet need.

2.1. Introduction

As a result of technological developments and financial constraints, hospital stays are becoming shorter. Patients now are discharged 'quicker and sicker' than used to be the case (Naylor 1990). Continuity of care and discharge planning are being emphasized by the Dutch government (National Health Council 1995, Commission on Modernisation of the Curative Care 1994) and Dutch nursing leaders (Abraham 1993, Grypdonck 1989) as major themes for the next decade.

In order to develop effective discharge planning, current insight into the kind of problem patients face after discharge is necessary. Numerous studies have already been done on this topic, especially in the USA and UK (Kelly *et al.* 1992, Armitage 1991, Rorden & Taft 1990). However, due to *differences* in health care systems across countries, these research findings do not necessarily reflect the situation in the Netherlands. Dutch research on continuity of care has focused mainly on organizational aspects (Fienig 1995, Abraham 1993, Kerkstra *et al.* 1990), such as poor communication between hospital staff and district nurses. Only one large Dutch study (Kerkstra *et al.* 1990) has focused on the problems patients face after discharge; this study was, however, carried out in 1987. Some Dutch studies are more recent but focus on a narrow category of patients (e.g. van Harteveld *et al.* 1995, Jaarsma *et al.* 1995). Since health care systems are changing rapidly, additional and current research into the nature and extent of post-discharge problems is needed before developing new discharge planning systems. The following research question was formulated for the initial phase of the study: what kind and how many problems do patients have following discharge from hospital?

Review of the literature

The literature indicates that patients have a wide variety of problems after discharge. These problems include limited ability to carry out personal care activities, housekeeping, decreased mobility, difficulty in following prescriptions, and difficulty in using appliances (e.g. Tierney *et al.* 1994, Mamon *et al.* 1992, Kerkstra *et al.* 1990, Jones *et al.* 1989, Kromminga & Ostwald 1987, Lindenberg & Coulton 1980, Roberts 1975, Skeet 1970). Diminished general health, reduced physical and emotional function are also seen as post-discharge problems (Keeling & Dennison 1995, White & Frasure-Smith

1995, McIntosh & Worley 1994, Tierney *et al.* 1994, Phillips 1993, Williams *et al.* 1992, Naylor 1990, Vandesande 1990, Cave 1989, Victor & Vetter 1989, Kromminga & Ostwald 1987, Johnson & Fethke 1985, Lindenberg & Coulton 1980, Roberts 1975, Skeet 1970).

Another well researched post-discharge problem is that of not receiving enough assistance in performing every day activities or not receiving enough support in dealing with physical and emotional complaints (Mamon *et al.* 1992, Rhoads *et al.* 1992, Kerkstra *et al.* 1990, Harding & Modell 1989, Jones *et al.* 1989, Kromminga & Ostwald 1987, Victor & Vetter 1985, Skeet 1970). These problems can impede the course of recovery and can lead to unplanned readmission (Tierney *et al.* 1994, Mamon *et al.* 1992, Williams & Fitton 1991, Jones *et al.* 1989, Narain *et al.* 1988).

The feeling of not being adequately informed is another problem which is frequently mentioned (Jaarsma *et al.* 1995, Keeling & Dennison 1995, Bull 1994, Tierney *et al.*. 1994, Jewell 1993, Boyle *et al.* 1992, Handcock & Knight 1992, Rhoads *et al.* 1992, Bubela *et al.* 1990, Chan 1990, Congdon 1990, Vandesande 1990, Sandler *et al.* 1989).

Some authors (Steele & Sterling 1992, Congdon 1990, Jones *et al.* 1989, Vandesande 1990) point out that the discharge itself can be a stressful experience, with a negative influence on (dealing with) post-discharge problems.

Although the literature indicates that post-discharge problems are influenced by several factors such as personal characteristics, social situation and medical condition, primary attention was paid to the existence and extent of post-discharge problems.

2.2. Methods

Since many authors (Mamon *et al.* 1992, Kerkstra *et al.* 1990) suggest the elderly are the most likely to experience problems after discharge, this study was limited to people aged 65 and above. Patients with a length of stay of more than 3 days were included. People living in institutional settings and patients discharged to institutional care were excluded.

Eight different nursing wards (1 ophthalmology, 2 general medicine, 1 general surgery, 2 neurology and 2 neurosurgery) volunteered to participate in the study. All nursing wards were part of a university hospital, in the Amsterdam metropolitan area.

Instruments

Post-discharge problems in this research were divided into four main areas: informational needs, functional limitations, problems of physical/emotional functioning and 'unmet needs'.

A structured questionnaire to measure post-discharge problems was developed, based on research instruments used in other studies (Boyle *et al.* 1992, Mamon *et al.* 1992, Kerkstra *et al.* 1990, Leyder & Pieper 1986, Roberts 1975, Skeet 1970). More information on the different parts of the questionnaire are given below.

a. informational needs

Informational needs were operationalized in terms of the patients' perception of not being sufficiently informed. This was assessed on a 13-item scale. Subjects were requested to indicate if they felt adequately informed about the items by answering 'yes', 'no' or 'don't know'. A total informational need score was computed as the sum of all 'no' answers. Patients could give additional comments.

b. functional limitations

Functional limitations were assessed by the patients' perception of the difficulty they had in performing several activities independently. Answers could be given on a five point scale ranging from '1 = no difficulty at all' to '5 = not able to'. This section was divided into five parts: personal care activities, housekeeping, mobility, prescriptions and appliances.

Functional limitations in personal care (FLPC) were measured in this way on a 5-item scale. The personal care activities items were washing hands, taking a bath or shower, dressing, combing hair and eating and drinking.

The composite score FLPC was the mean of the responses to the five items.

Functional limitations in household activities (FLHA) were assessed in a similar way on a 7-item scale. FLHA items were preparing meals, shopping, heavy housework, doing the laundry, making beds, washing dishes and light housework. The composite score FLHA was the mean of the responses to the seven items.

Functional limitations in mobility (FLMO) were assessed on a 5-item scale (getting out of bed, going to the bathroom, climbing stairs, walking outside, travelling). A composite FLMO score was computed as the mean of the responses to the five items.

Functional limitations in following prescriptions (FLPR) was measured by a single question on the amount of difficulty experienced; examples of prescriptions such as using eye drops, taking medication, following diet, etc., were given.

Finally, functional limitation in using appliances (FLAP) was also measured using a single question on the difficulty patients had in handling the appliances concerned (examples as using a wheelchair or a special bed, etc., were given).

c. physical/emotional function

This section was divided in three parts: general health, physical complaints and emotional complaints.

General health was measured by the Dutch version of the Nottingham Health Profile. This instrument consists of 38 items, representing six dimensions (physical mobility, emotional reaction, sleep, pain, energy and social isolation). This instrument is widely used and tested several times on psychometric properties (Konig-Zahn *et al.* 1993).

Physical complaints were measured on a 9-item scale. Items were derived from those used by Roberts (1975), namely pain, sleep disturbance, shortness of breath, standing unstable, trembling hands, abnormal bowel movement, feeling tired, nausea/vomiting and incontinence. One open question on other physical complaints was added. Answers could be given on a five point scale varying from '1 = no trouble at all' to '5 = very much trouble'. A composite physical complaint score (PCS) was computed as the mean of the responses to the nine items.

Similarly emotional complaints were measured by a 6-item scale, consisting of items such as feeling lonely, feeling restless, feeling sad, feeling anxious, feeling uncertain, being worried; one open question on other emotional complaints was added. Answer categories were the same as for the physical complaints, as was the composite emotional complaint score (ECS).

d. unmet needs

An 'unmet need' was defined as the wish of patients to have more assistance in performing some activities or for more support/advice in dealing with physical or emotional complaints.

Unmet needs were measured with each item from the above-mentioned scales by asking 'Would you like to have (more) help/support with this'? The possible answers were 'yes', 'no', 'don't know'.

Validity

As the instrument was newly developed, some psychometric properties were assessed. In addition to a review of the literature, content validity of the instrument was reviewed by a multidisciplinary panel consisting of two hospital head nurses, a community liaison nurse, a staff nurse from the home health care organsiation, a staff nurse from the hospital, a social worker, a physician and a nurse researcher. Furthermore content validity was checked by qualitative open interviews with nine recently discharged patients: all items from the questionnaire were mentioned by the patients; patients also mentioned leisure involvement and taking care of pets as problem areas that were not included in the instrument.

The acceptability and lay-out of the questionnaire was first commented on by research colleagues. The questionnaire was then pilot-tested on two patients and after some changes again on another 10 patients. Since the pilot-tests indicated some patients might have difficulty in filling out the questionnaire, it was decided to use structured questionnaires and structured home interviews in parallel. This allowed us to check the adequacy of both measurement modes. Two versions of the final instrument were prepared; one as a postal questionnaire and one to be used as a structured interview at home.

During the research period, no special difficulties were encountered with the questionnaires or interviews.

The reliability of the several parts of the two instruments was measured by the internal consistency coefficient Cronbach's alpha; all alpha's were above 0.80 with exception for the PCS-alpha of 0.72.

Procedure

The research proposal was approved by the ethics committee, the scientific committee, the privacy committee, by all head nurses and all medical supervisors of the participating wards.

Data were collected during a 3-month period. During the hospital stay patients were informed by the head nurse.

The hospital information system on discharged patients was checked daily. Patients were divided among the interview or questionnaire group on an aselective basis.

A questionnaire was sent on the fifth day after discharge followed by a reminder on the seventh day post-discharge. If the questionnaire was not returned before the twelfth day after discharge, a telephone call was made.

Patients in the interview group were called on the fifth day after discharge and asked to participate in the study; if they agreed, an appointment was scheduled around the seventh post-discharge day.

2.3. Results

During the 3 months of data-gathering, 251 patients met the inclusion criteria; 114 received a questionnaire, and 137 patients were asked for a interview. The total number of fully completed questionnaires ready for quantitative analysis amounted 145 (58%). Reasons for non-compliance were 'feeling too sick (31%)', 'readmitted (10%)', 'died (2%)', 'having no problem (9%)', 'don't feel like a questionnaire/interview (12%)', 'other (14%) and 'unknown (21%)'. Mean time lag between discharge and completion of questionnaires was 9.7 days (mode 7, sd 4.4).

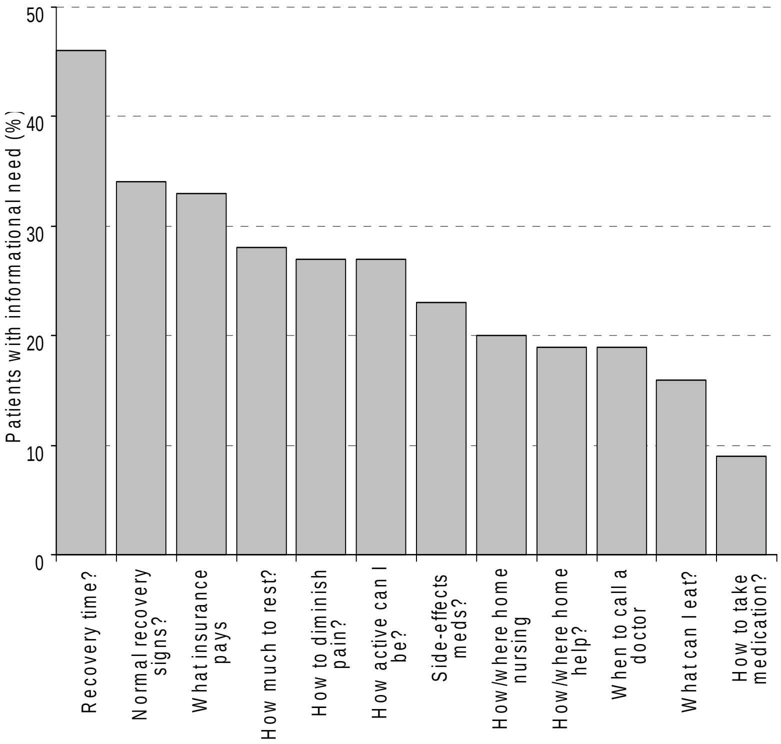
Mean age of the population was 75.6 years (sd= 6.9, range 65-93); mean length of stay was 12.4 (sd=11.6, median=9, range 4-95); 43% were male and 57% were female. No significant differences were found between response and non-response group on these variables.

Postal questionnaires gave similar results as the home interviews. For that reason both groups will be discussed together in the following results section.

Informational needs

Figure 2.1 shows the results on informational needs. Overall 79% of the patients did not feel sufficiently well informed about one or more items. The mean number of informational needs was 3.1 (median 2).

Figure 2.1 Informational needs 1 week after discharge (n=145)



Most frequent informational needs concerned the course and signs of recovery. Additional information was also needed on health care insurance coverage and on prescriptions. Qualitative information gave some examples about informational needs as 'Do I have to continue eye drops in the eye not-operated on?' or 'can I cry...?' or 'they gave a lot of information on my diet including a calorie list, but I cannot use it when I'm cooking'.

Functional limitations

Table 2.1 shows how many people experienced difficulty in the different areas of activity. Housekeeping is the area where most patients reported problems; it is also the area with the highest mean difficulty score.

Table 2.1 Functional limitations 7 days after discharge (n-145)

Area	n (%) with difficulty	Mean (sd) difficulty score *
Personal care	77 (53)	1.75 (1.0)
Housekeeping	112 (77)	2.94 (1.5)
Mobility	108 (74)	2.40 (1.2)
Prescriptions	50 (34)	2.37 (1.8)
Appliances	17 (12)	1.67 (1.3)

* difficulty scores vary between 1 and 5 (1 = no problem at all; 5 = very great problems)

Physical/emotional functioning

The results of the Nottingham Health Profile adjusted for age and gender (Table 2.2), show that the overall health of recently discharged patients is worse than for a general population with exception for the age category above 75 years.

Table 2.2 Nottingham Health Profile scores

		Male		Female	
AGE	**DOMAIN**	**7 days after discharge**	**Normal population ****	**7 days after discharge**	**Normal population ****
65-70 (n=40)	Mobility	23.3	7.3	37.5	18.0
	Pain	11.7	8.8	29.7	20.9
	Sleep	21.9	19.9	34.9	38.5
	Energy	30.6	13.8	53.9	23.6
	Social	6.4	2.7	10.8	5.9
	Emotional	11.7	5.3	16.8	12.5
71-75 (n=38)	Mobility	29.4	9.6	39.9	16.9
	Pain	18.4	7.3	18.5	16.4
	Sleep	22.9	16.8	29.1	30.4
	Energy	44.4	20.0	39.7	34.4
	Social	3.8	4.2	12.1	10.7
	Emotional	16.7	8.7	10.3	14.5
>75 (n=67)	Mobility	27.6	21.3	44.1	36.1
	Pain	11.9	14.1	20.1	25.9
	Sleep	13.7	30.6	41.9	29.9
	Energy	36.0	29.3	39.7	44.0
	Social	2.9	9.8	16.5	12.1
	Emotional	9.9	12.8	20.2	16.6

** Adapted from Konig-Zahn *et al.* (1993).

Almost 90% of the discharged patients had one or more physical complaint; 'being easily tired' (75%), 'standing unstable' (69%), 'having pain' (54%) and 'not sleeping well' (42%) were the most common physical complaints.
Two-thirds said they had difficulty with one or more emotional complaints: feeling worried (44%) being the most frequent.
Number and mean trouble score in these areas can be found in table 2.3.

Table 2.3 Physical and emotional complaints 7 days after discharge

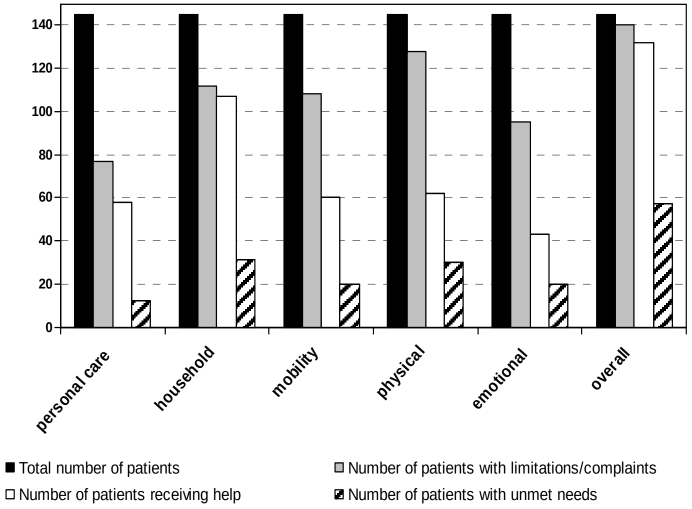
Physical/emotional functioning	**n (%) with one or more complaint**	**Mean (SD) trouble score ***
Physical complaints	128 (88)	1.78 (0.6)
Emotional complaints	95 (66)	1.59 (0.8)

* trouble scores can vary between 1 to 5 (1 = no trouble at all; 5 = very great trouble with all items)

Unmet needs

Figure 2.2 gives an overview of the number of patients with limitations and complaints, the number of people receiving help and the number of persons who would have liked additional help (unmet need).

Figure 2.2 Unmet needs 1 week after discharge (n=145)



As can be seen in Figure 2.2, most people receive assistance in the areas they reported having trouble with. By and large help was given by relatives (partner, children, neighbours and friends). Of the patients, 30% had contact with their general practitioner and 16% said they had assistance from a community nurse in the first week after discharge. During the interviews many patients said they did not want (further) help because 'other people needed it more', or because they thought 'there was no help for my kind of problems', or because they were 'afraid to become dependent on others'. Unmet needs varied from 10% in relation to personal care to 20% of the total population for help with household activities and advice on physical complaints. When the number of people with unmet needs are seen as a percentage of people suffering limitations, those with unmet needs rises to 26% for household activities and to 22% for physical complaints. Overall, almost 40% of the patients with some kind of problem had one or more unmet need.

2.4. Discussion

Feeling inadequately informed is a frequent post-discharge problem. Patients had questions in particular with regard to their illness and recovery; another main area of informational need relates to the prescriptions and life rules. Other studies (Boyle *et al.* 1992, Chan (1990), Jaarsma *et al.* 1994) provided very comparable results.

In this study we did not ask how great a problem was caused by the need for information; in the study by Jaarsma *et al.* (1994) however, it was demonstrated that feeling inadequately informed, was a real problem area.

The need for information we found, does not necessarily mean that the information was not given in the hospital. The information may have been given when the patient was unprepared for it. Comprehensive research is needed on the information strategies used in the hospital with regard to place, person, way, content, time, etc., in relation to the post-discharge outcome.

There is also a possibility that informational needs are questionnaire-induced. Some people might feel ill informed, but they do not consider it as a problem until they are questioned about it specifically. However, studies (van Ooijen & van Meeteren 1995, Steele & Sterling 1992, Congdong 1990, Vandesande 1990) using an open qualitative approach also found informational needs to be a major discharge problem.

A second major post-discharge problem is the large number of patients having difficulty with household activities. Maybe this is not surprising when one takes the age of the research population into account. However, most patients said they had either none or less difficulty with these activities before they were hospitalized. Other studies (Guadagnoli 95, Victor & Vetter 1989) showed that patients could estimate their previous daily activity reliably, so one can assume that the functional constraints we found are really hospital induced.

Other researchers (Mamon *et al.* 1992, Kerkstra *et al.* 1990) also identified housekeeping as a major problem for elderly people after discharge.

A reassuring finding in this study is that patients receive help and assistance in the initial post-discharge period. By and large the help was given by relatives. This was also found in other studies (Jackson 1990, Jones *et al.* 1989, Victor & Vetter 1988, Kromminga & Ostwald 1987, Waters 1987, Lindenberg & Coulton 1980). It is not known to what extent this help was adequate and correct, nor did we ask about the burden this imposed upon the caregivers. These are aspects that have to be taken into consideration in future research.

Although the patients received help and assistance, there are still 37% of the patients with one or more unmet needs. For an interpretation of the number of unmet needs, it must be realised that the percentage is rather low as a lot of patients informed the interviewers they did not want (additional) help or advice, because they did not wish to be dependent on others or preferred not to bother them. Other patients considered their complaint or inability as something that no one could give advice about or as something you had to live with.

Some people considered their problem insufficiently important to bother a doctor or the hospital with. Other people did not want professional services because of bad experiences in the past. The number of people with unmet needs is comparable with that found by Oktay *et al.* (1992) and Mamon *et al.* (1992). The strategies patients use to refuse further assistance were also described by Jones *et al.* (1989).

It is interesting to note that problems after discharge found in this Dutch study seem not to differ very much from studies elsewhere in the world, nor from studies carried out in the seventies or eighties.

2.5. Conclusion

From this study, it can be concluded that elderly people experience a wide variety of limitations and problems shortly after discharge from hospital. Feeling ill informed and having difficulty with housekeeping are the major ones. Most people rely on relatives for support. However, 37% of the patients report some kind of unmet need.

It is consequently important for nurses, physicians and other health care professionals to look critically at the information strategies they currently use and how they can be improved.

It would also seem important to involve relatives in a discharge plan to make sure they are able to give the help patients need and to avoid burdening caregivers.

This study will continue with research on predicting variables for negative post-discharge outcomes, so that high risk patients can be identified soon after admission and optimal discharge planning can be given to them.

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3

Problems related to hospital discharge or age? A comparison of problems and care needs in two elderly populations

Oosterhek M, Mistiaen P, Duijnhouwer E: **Ziekenhuisontslag- of ouderdomsproblemen? Vergelijking van problemen en zorgbehoeften bij twee groepen ouderen.** *TSG/Tijdschrift voor gezondheidswetenschappen 2000,* ***78****(1),35-42*

Abstract

The Problems-After-Discharge (PAD) Project is aimed at studying the problems patients experience at home following discharge from a general hospital, to gather insights that can be used for improvement of patient care around discharge. This study is part of the PAD project. General health and problems and care needs in the daily functioning of recently discharged elderly were compared with those of elderly who had not recently been hospitalised. It was hoped to clarify the extent to which the problems identified in an earlier phase of the project are specific to recently discharged elderly. It was aimed to make the research setting as equal as possible for both groups. The Problems-After-Discharge-Questionnaire, developed on behalf of the PAD project, was used as well as the Nottingham Health Profile and the COOP/WONCA instruments. The results indicate poorer functional status, emotional status, general health and social functioning for the recently discharged elderly. They also received more help or support in all areas concerned and had a greater wish for (additional) help or support. Furthermore, when only the non-hospitalised elderly with an illness were compared to the discharged group, the differences remained, albeit to a somewhat reduced extent. Initiatives aimed at reducing the post-discharge problems could be taken before, during and after hospitalisation. Although many elderly do receive help, this is chiefly informal care, with little input from professionals. Early involvement of patients and their informal carers in the discharge process as well as cataloguing the extent of the available informal help is important.

Key words: elderly, patient discharge, post-discharge problems, care needs, comparative study

3.1. Introduction

In recent years there has been a steady increase in cross-boundary projects promoted by the health services and the government. The emphasis is on collaboration between primary and secondary care, continuity of care, integrated care and patient-oriented care. The aim is to ease the transition between care settings [1-5]. According to the Council for Public Health and Health Care (RVZ, formerly NRV) there is a need for a multi-facetted approach to the patient, taking account of more than just medical aspects.

An important transition between care settings is that from hospital to the patient’s home. The last major Dutch study on the problems experienced by patients in this respect dates from 1987 [6]. Partly in this context, the Problems-After-Discharge (PAD) Project was set up in 1995 on behalf of the VU university hospital and the district health services in Amsterdam (Stichting Amsterdams Kruiswerk). The aim of this project was to catalogue the problems experienced by patients at home following discharge from a general hospital, as well as the underlying reasons. It was hoped to gain insights which professional caregivers could use to improve patient care around hospital discharge. The PAD project consisted of several parts. One of these involved the development of a theoretical model for post-discharge problems based on a review of the literature [7]. The results showed that after discharge from hospital, patients experienced a wide range of problems in the areas of functional status, emotional status, general health and social functioning. Other important problem areas included the need for (additional) support, help, advice and information.

A subsequent part of the PAD project involved the development of a measuring instrument aimed specifically at post-discharge problems. A literature review showed that most studies use their own instruments to measure problems after discharge, each with its own (local) characteristics. On the basis of these instruments, a new questionnaire was compiled for the PAD project – the Problems-After-Discharge Questionnaire (PADQ), in combination with existing generic instruments. The problem areas identified via the literature review are represented by one or more elements of the PADQ. It was also aimed to formulate the questions in such a way that the professional carers would gain sufficient insights to be able to address the problems identified.

A study designed to catalogue problems after discharge was subsequently conducted among an elderly population, because the literature had shown that this group experienced the most problems. This study was conducted at 7 and 30 days following discharge [8-11]. The problems reported by the Dutch elderly were comparable to the above-cited problems reported in the international research [see i.a. 7, 12-16].

Another part of the PAD project involved setting up interventions on the basis of the problems catalogued, and testing their effectiveness. This process included follow-up telephone calls to patients after an ophthalmic procedure, mainly with a view to meeting the need for support, advice and information [10,17,18].

It proved more difficult to get other interventions off the ground. One reason was that caregivers indicated that it was unclear whether the problems identified were specific to elderly who had recently been discharged from hospital, or whether the problems were generally age-related. A comparison of the problems identified in the PAD project with studies in general populations of elderly [19-24] shows that the recently discharged elderly do seem to experience more difficulties. However, there are a number of objections to comparisons of this nature. There are differences of methodology, different operationalisations and different inclusion criteria for both groups.

For this reason it was decided to also submit the PADQ questionnaire to elderly living at home who had *not* been recently hospitalised, in order to attain a better comparison with the problems found among recently discharged elderly. Thus it was hoped to achieve more clarity about the following research question:

Is there a difference in the general health and the extent to which problems and care needs in daily functioning are experienced by recently discharged elderly compared to elderly who have not recently been hospitalised?

3.2. Methods

Design and research population

A study was conducted of the health situation, problems and care needs experienced in daily functioning at home by two elderly populations, ‘recently discharged elderly’ and ‘average elderly’. The findings with regard to both groups were subsequently compared.

It was aimed to keep the method used, the operationalisations and the inclusion criteria for both groups as similar as possible. For both groups, the same written questionnaire was sent to the home addresses of the elderly. Only people aged over 65 living independently in Amsterdam were included in both groups. It was also aimed by means of stratification to achieve an equal spread in terms of age, gender and postal code address. In the autumn of 1995 a survey was conducted among independently living elderly (65+) who had recently been discharged from a general hospital (hereafter called ‘discharged elderly’. By means of the hospital information system a daily check was made to establish whether there were patients who met the inclusion criteria: a minimum hospital stay of four days, aged over 65 and discharged to their own homes. Nine hospital wards were involved in this study: eight wards in the VU university hospital and one ward at the BovenIJ hospital in Amsterdam. The patients were given information about the study by a senior nursing staff member. 527 patients met the inclusion criteria. These received the questionnaire at their home address at 7 and at 30 days following discharge from hospital.

The second group of elderly consisted also of independently living elderly, who however, had *not* been hospitalised during the previous six months (hereafter known as ‘average elderly’). This group was compiled on the basis of the age distribution and spread of postal code address found within the group of discharged elderly. Using the Amsterdam Register, random samples were taken in mid-1997 for three age categories (65-74, 75-84 and 85+) of a total of 800 independently living elderly. Of this group, 263 objected to their personal data being sent to the researcher. The questionnaire was sent to the remaining group of 537 elderly.

The measuring instruments

As was stated in the Introduction, a review of the literature highlighted four key areas where people experience problems following discharge from hospital. These are functional status, emotional status, general health and social functioning. A further important area of concern is the need for (additional) help or support following discharge. In order to determine the extent of the problems and care needs in these areas in both groups of elderly, the instruments used were the Problems-after-Discharge Questionnaire (PADQ), the COOP/WONCA charts [25] and the Nottingham Health Profile (NHP) [26]. Table 3.1 shows which dimensions of these three instruments were used to determine the status of the various problem areas.

Seven dimensions were distinguished within the PADQ:

- Personal care: 'During the past week were you able to independently wash your hands, take a shower or bath, get dressed and undressed, comb your hair and eat and drink?' (5 items);
- Household activities: 'During the past week were you independently able to prepare meals, do shopping, cleaning, laundry, make beds, wash dishes and tidy the living room?' (7 items);
- Mobility: 'During the past week were you independently able to get out of bed, go to the toilet, climb the stairs, walk outdoors, travel?' (5 items);
- Appliances: *if applicable* 'During the past week were you independently able to use/work these appliances (walking stick, wheelchair, special bed, etc.)?' (1 item);
- Prescriptions: *if applicable* 'During the past week were you independently able to follow these prescriptions (take medication, use eye drops, ointment, etc.)?' (1item);
- Physical function: During the past week did you experience pain, sleep disturbance, shortness of breath, unstable posture, trembling hands, abnormal bowel movement, tiredness, nausea/vomiting, incontinence or other physical complaints?' (7 items).
- Psycho-social complaints: 'During the past week did you feel lonely, restless, sad, anxious, uncertain, worried, or did you have any other emotional complaints?' (7 items).

There are five possible answers for the first five items:

1 = no difficulty at all, 2 = a little difficulty, 3 = with difficulty, 4 = with great difficulty and 5 = not at all. An average score was calculated for these items, as well as the percentage of elderly that had (more or less) difficulty

with one or more activities within the items concerned. For the physical and psycho-social items, the possible answers are: 1 = not at all, 2 = a little, 3 = some, 4 = a lot and 5 = very great difficulty. Likewise, average scores were calculated for these items, and for the percentage of respondents that had complaints (a little to very great) relating to one or more of the items listed.

The percentages give an indication of the *number of elderly* in both groups who have difficulty with one or more items in the various dimensions. The averages also indicate the *extent* to which elderly in both groups experience problems. An average of one means that all activities within the dimension concerned can be carried out without any difficulty, or that the respondents had no complaints. An average of five means that none of the activities could be carried out at all, or that the respondents experienced all the complaints to a great extent.

For all seven dimensions, it was then asked whether the respondents received help or support with the activities. It was also asked whether more help or support was wanted. The possible answers were ‘yes’, ‘no’, and ‘don’t know’. This made it possible to establish whether the elderly experienced additional unmet care needs besides the help they were already receiving.

The PADQ dimension ‘informational need’, which asked whether respondents felt sufficiently informed about a number of topics (e.g., pain, recovery, medication), was not submitted to the ‘average elderly’, as questions were largely irrelevant for this group. The COOP/WONCA is a generic measuring instrument used to measure general health. The COOP/WONCA distinguishes six dimensions (physical fitness, daily activities, emotional status, social activities, general health and changes in health status). Each dimension is measured by means of a question with five possible answers, which are graphically illustrated. The scores may vary from 1 (good health) to 5 (poor health). The COOP/WONCA reference period is the past two weeks.

Table 3.1 Main problem areas after hospital discharge, as derived from the literature review, and the instruments by which they were operationalized

Main problem areas after hospital discharge	**Operationalization**
Functional status	PADQ: -personal care -household activities -mobility -using appliances -following prescriptions NHP: -physical mobility -energy COOP/WONCA: -physical fitness -daily activities
General health	PADQ: -physical functioning NHP: -pain -sleep COOP/WONCA: -general health
Emotional status	PADQ: -psychosocial complaints NHP: -emotional reaction COOP/WONCA: -emotional status
Social functioning	NHP: -social isolation COOP/WONCA: -social activities
Unmet needs	PADQ: -all 7 dimensions

The NHP is also a generic instrument used to measure general health and has six dimensions (physical mobility, energy, emotional reactions, social isolation, pain, sleep). Each dimension is measured on the basis of a number of assertions, varying between three and nine, each with a dichotomous response option. In total, the NHP consists of 38 assertions. Respondents are asked how they feel at the time of completing the questionnaire. For each dimension a total score from 0 (good health) to 100 (poor health) is calculated by means of an item-related weighting factor.

In addition to these instruments, questions were asked in relation to the background variables of age, gender, insurance type and living situation, in order to establish how comparable these groups of elderly are. The group of ‘average elderly’ were also asked whether they had been hospitalised during the past year, and if so how long ago they were discharged. The question contained in a Statistics Netherlands (CBS) survey as to whether the respondent suffers from one or more long-term illnesses, conditions or disabilities was put to the ‘average elderly’, in order to assess the representativeness of this group for the Dutch population [27,28].

Because the PADQ is a newly developed instrument, its psychometric qualities have been tested in a number of ways [7,8,11,29]. The content validity has been guaranteed by means of an extensive literature review and by the fact that (elements) of measuring instruments used in (foreign) research on post-discharge problems were incorporated in its design [7, 12-16]. Furthermore, the content was evaluated by experts and tested by means of open interviews with patients [29]. The Brass-index [11,30], an instrument designed to predict post-discharge problems in patients was used in the ‘discharged elderly’ when they were admitted to hospital. The expected correlation between this instrument and the PADQ dimensions was confirmed (Pearson correlation coefficients 0.33-0.53, $p<0.01$). In addition, the expected correlation was found between PADQ dimensions and dimensions of the COOP/WONCA and the NHP instruments, which were presumed to measure the same constructs [8]. By means of explorative factor analyses, confirmation was found for the uni-dimensionality of the dimensions, except for ‘physical complaints’. In addition, the internal consistency of the individual dimensions were found to be reasonable to good (Cronbach’s alpha 0.72-0.95), in both the ‘average elderly’ and the ‘discharged elderly’.

Statistical Methods

Differences between both groups in the number of elderly that had difficulty with activities, or had complaints were examined using Chi-square tests. These tests were also used to determine the differences between both groups regarding the number of elderly who did receive help, and the number who wished to receive (additional) help. Differences in averages between both groups were examined with t-tests. This applies both to the PADQ dimensions and the NHP dimensions. In order to evaluate the differences in averages for the COOP/WONCA dimensions, the non-parametric Mann Whitney test was used.

3.3. Results

Response and Patient Characteristics

From the group of 'discharged elderly', 309 usable questionnaires were returned (59% response rate). The average duration of hospitalisation was 11.6 days; the average age was 74.2 years; 54% were female; 41% were living alone and 62% had public insurance. A non-response analysis showed that the non-respondents were older than the respondents, but that there were no differences between respondents and non-respondents for length of hospital stay, gender, percentage of people living alone or insurance type.

The 'average elderly' returned 303 questionnaires, of which 36 related to elderly who had been discharged from hospital during the previous six months. These 36 questionnaires were excluded, leaving 267 usable questionnaires (53% response rate). The average age in this group was 74.2, 60% were female, 45% lived alone and 65% had public insurance. A non-response analysis showed that the average age of the non-respondents (77.5) and of the elderly who objected (76.6) is higher than that of the respondents; no significant difference was found in gender distribution between these two groups. In addition, a comparison was made with the Dutch population in order to check the representativeness of the 'average elderly'. This showed that both age distribution and gender distribution was similar in the Dutch elderly population and the 'average elderly', as was the number of elderly who suffered from one or more long-term illnesses, conditions or disabilities (circa 50%) [27,28]. Both groups of respondents, the 'average elderly' and the 'discharged elderly' do not differ significantly in terms of age, gender, insurance and whether they live alone.

Comparison of Problem Areas

Of the elderly who had recently been discharged, there are *more elderly who experience problems* than among the ‘average elderly’ for six of the seven PADQ dimensions (Table 3.2). The relative largest discrepancy relates to personal care, with almost three times the number of ‘discharged elderly’ who experienced problems. There were also more ‘discharged elderly’ than ‘average elderly’ who used medical appliances (41%-24%) and more who used prescriptions (79%-66%).

Table 3.2 Comparisons between ‘recently discharged elderly’ and ‘average elderly’ for number of people having problems and for mean problem score

PADQ dimension	**Recently discharged elderly (n=309)**		**Average elderly (n=267)**	
	%	**Mean**	**%**	**Mean**
Personal care	51.3	1.69	18.1 **	1.16 **
Household activities	81.7	2.85	47.6 **	1.54 **
Mobility	76.9	2.33	43.2 **	1.43 **
Appliances [a]	31.2	1.84	26.6	1.47 **
Prescriptions [b]	42.6	2.26	22.9 **	1.38 **
Physical function	92.1	1.82	81.4 **	1.50 **
Psycho-social complaints	63.8	1.66	54.7 *	1.38 **

[a] percentages based on the elderly who in fact used appliances (N=128, respectively N=64)
[b] percentages based on the elderly who really had prescriptions (N=244, respectively N=175)
* = $p<0.05$; ** = $p<0.001$ (χ^2- test, T-test)

The mean scores for the PADQ dimensions for both groups are also given in Table 3.2. For all dimensions, the ‘discharged elderly’ had a higher mean score, indicating that they had *a greater degree of problems* than the ‘average elderly’. The relatively largest discrepancy was found for household activities.

The ‘discharged elderly’ had help for an average of 6.5 activities/problems, whereas this was much lower for the ‘average elderly’, viz 1.9. Table 3.3 shows the help received and the (additional) help desired for the different dimensions for both populations. Of the 309 ‘discharged elderly’, 85%

received (professional or informal) help for one or more activities/problems, as compared to 43% of the 267 'average elderly'.

Table 3.3 Percentages of elderly receiving help or support or wanting (additional) help or support

PADQ DIMENSION	% 'recently discharged elderly' (n=309)	% 'average elderly' (n=267)	
Personal care			
receives help	33	7	**
wants (additional) help	11	2	**
Household activities			
receives help	73	35	**
wants (additional) help	20	13	*
Mobility			
receives help	39	11	**
wants (additional) help	13	7	*
Appliances [a]			
receives help	18	9	
wants (additional) help	3	2	
Prescriptions [b]			
receives help	40	15	**
wants (additional) help	7	3	
Physical functioning			
receives help	45	15	**
wants (additional) help	22	13	**
Psycho-social complaints			
receives help	33	14	**
wants (additional) help	13	7	*
TOTAL (all dimensions)			
receives help	85	43	**
wants (additional) help	33	20	**

[a] : percentages based on the elderly who in fact used appliances (N=128, respectively N=64)
[b] : percentages based on the elderly who really had prescriptions (N=244, respectively N=175)
* = $p<0.05$; ** = $p<0.001$ (χ^2- test, T-test)

In both populations, the greatest amount of help was received for household activities. In all dimensions the 'discharged elderly' received more help than the 'average elderly'. However, the 'discharged elderly' also had a greater wish for (more) help or support for activities and problems. The greatest wish for (more) help in both populations was found for household activities

and physical complaints.
A calculation was also made (although not included in the table) of which section of the elderly with problems in the various dimensions received help or desired (more) help. Here too, the percentages were higher for the ‘discharged elderly’. Of the ‘discharged elderly’ who experienced problems in one or more dimensions, 90% receive help for one or more dimensions, as compared to 55% of the ‘average elderly’. Furthermore, 41% as compared to 28% desire (more) help for one or more dimensions.

The first two tables show that the ‘discharged elderly’ have a poorer functional, emotional and general health status than the ‘average elderly’. This picture is confirmed by the mean scores of both groups of elderly for the COOP/WONCA and the NHP (Table 3.4). Besides, the mean scores for the social activities dimension of the COOP/WONCA and the social isolation dimension of the NHP show that the ‘discharged elderly’ have poorer social functioning than the ‘average elderly’.

Table 3.4 Comparison between ‘recently discharged elderly’ and ‘average elderly’ of mean scores on COOP/WONCA and NHP

	% ‘recently discharged elderly’ (n=309)	**% ‘average elderly’ (n=267)**	
COOP/WONCA Dimensions			
Physical fitness	3.63	2.82	**
Emotional status	2.02	1.76	**
Daily activities	2.85	2.01	**
Social activities	2.30	1.63	**
General health	3.26	2.78	**
NHP Dimensions			
Physical mobility	33.0	15.8	**
Pain	19.2	14.1	*
Sleep	25.4	24.0	
Energy	41.4	22.5	**
Social Isolation	10.2	7.5	
Emotional Reaction	12.9	10.0	

* = $p<0.05$; ** = $p<0.001$ (Mann-Whitney test, T-test)

In the case of all the ‘discharged elderly’, there was a reason for having been hospitalised: an illness, a condition, disability, etc. It is also known for the ‘average elderly’ population whether they had one or more long-term illnesses, conditions or disabilities, which indeed was the case for 124 of the

267. These 124 elderly with ‘illness(es)’ underwent a separate additional comparison with the ‘discharged elderly’. Even then, the ‘discharged elderly’ showed poorer functional, emotional and general health status as well as poorer social functioning, albeit less markedly so.

3.4. Conclusion and Discussion

This study compared the general health and problems and care needs for the daily functioning of elderly who had recently been discharged from a general hospital to elderly who had not recently been admitted to hospital.

The findings obtained with the self-developed Problems-after-discharge questionnaire (PADQ) show a consistent picture. The recently discharged elderly experienced more and greater problems with personal care, household activities, mobility, the use of appliances and following prescriptions (poorer functional status). The ‘discharged elderly’ also experienced more and greater psycho-social complaints (poorer emotional status) and more and greater physical complaints (poorer general health status). This picture was confirmed by the results of the often used and validated COOP/WONCA and NHP, and in addition, these instruments showed poorer social functioning among the ‘discharged elderly’. The ‘discharged elderly’ also received more help or support for the activities/problems; they experienced a greater need for (additional) help or support and they were more likely to use medical appliances and prescription drugs.

The low response in both groups of elderly (53% and 59%) may constitute a problem in interpreting the results. There is the possibility of a selective response because the questionnaires may have been completed mainly by elderly with fewer health complaints. However, it may be assumed that if this is the case, the selective response will have been more or less equal in both groups.

It was aimed to make the research setting as equal as possible for both groups of elderly, in order to ascertain their general health situation and their problems and care needs in daily functioning. In order to achieve this, both groups were given the same written questionnaires, the same inclusion criteria were used and stratification was applied in selecting the ‘average elderly’. With regard to age, gender, insurance type and living situation, there are no significant differences between both groups of elderly. In the case of all discharged patients, there was a reason for their hospitalisation, which makes it more probable that the ‘discharged elderly’ were in poorer health than the ‘average elderly’ prior to admission. It could be argued that the differences identified between the two groups may therefore be more closely related to this state of health than to hospitalisation. However, when the ‘discharged elderly’ were compared to sick(er) ‘average elderly’, the differences remained, although to a reduced degree. The ‘discharged elderly’ were also asked about their situation prior to hospitalisation. The results showed that most of the respondents were experiencing new or aggravated problems post-discharge [8]. Bearing in mind that other studies [31,32] have shown that patients are well capable of evaluating their pre-hospitalisation daily functioning, this also provides an indication for a link between the (differences in) problems and care needs found and hospitalisation. A longitudinal study with a before-and-after test could provide more clarity about the extent to which the problems and care needs of ‘discharged elderly’ are related to hospitalisation. One study of this kind has found that anaesthesia and surgery lead to both short-term and long-term post-operative cognitive impairment among the elderly. It was also found that this cognitive impairment was correlated to limitation in daily activities, and it was concluded that elderly with post-operative cognitive limitations needed more support in their daily activities than before surgery [33].

According to two recent studies, about one third of elderly experience a deterioration in functional status after discharge [34,35]. The illness which led to hospitalisation did not appear to be a good predictor of post-discharge problems. Other presumed causes include: the negative effects of medical and surgical treatments, negative effects of medication policy and deconditioning caused by enforced bed-rest.

Initiatives could be taken at the time of hospital admission, during the hospital stay and after discharge, to reduce the post-discharge problems and maximise independence. It is very important that patients at increased risk of post-discharge problems should be identified as soon as possible, in order to devote extra attention to this group. Risk screening instruments could be used, such as the Brass-index [11,30], or the ‘Hospital Admission Risk

Profile’ [35,36]. During the hospital stay, functional limitations could be prevented as much as possible by, for example: wards adapted specially for the elderly, physical therapy programmes, modified treatment by doctors and nursing staff and additional attention to medication and dietary policies [34]. Additional focus on the aftercare of risk patients following discharge may also lead to a reduction in the post-discharge problems in the long term. Possible initiatives in this respect may include rehabilitation programmes aimed at cognitive function and mobility, conducting a follow-up by telephone, making informational material available or setting up drop-in or call centres where both the patient and their informal carers can apply for help [34,35].

Although a large proportion of the elderly already receive help and support in various domains after discharge, the role of professionals is minor in this respect. Most help comes from the patient’s immediate circle. The fact that four out of ten ‘discharged elderly’ indicate that they need (more) help and advice may be regarded as an underestimation, because many elderly claim they don’t want to be dependent on others or a nuisance to anyone; they may think that they cannot get help or they have to learn to live with their problems. An important factor therefore in striving to improve patient care around discharge is to involve both the patients and their immediate circle as early as possible in the discharge process. The extent of the informal care available could also be catalogued, and if necessary, steps could be taken at an early stage to secure (extra) professional input. The results of this study would appear to underline the fact that the insufficient availability of informal care or access to professional care means that there are limits to how far policies can be stretched such as reduction of hospital stays and substitution of care.

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4 Predictive validity of the BRASS index in screening patients with post-discharge problems

Mistiaen P, Duijnhouwer E, Prins-Hoekstra A, Ros W, Blaylock A: **Predictive validity of the BRASS index in screening patients with post-discharge problems.** *J Adv Nurs, 1999,* ***30:*** *1050-1056*

Summary

Rationale: Discharge planning is a nursing intervention that aims to ensure continuity of care; it consists of several steps of which selecting patients in need of it is the first one. The Blaylock Risk Assessment Screening Score (BRASS) index is a risk screening instrument which can be used early after admission to identify those patients in need of discharge planning.

Aim: To test the predictive validity of the BRASS index in screening patients with post-discharge problems

Design: Prospective longitudinal design with prediction instrument measured at admission, and outcomes measured at discharge and 7 and 30 days after discharge

Outcome measures: length of stay, discharge destination, status after discharge

Instruments: BRASS index, Problems after discharge Questionnaire, Nottingham Health Profile, COOP/WONCA charts

Research method: 503 elderly patients were screened at admission with the BRASS index. Length of stay and discharge destination were measured at discharge in these same patients. Outcomes after discharge were gathered only in patients who were discharged home and with length of stay of more than 3 days (n=226); outcomes were measured by postal questionnaires at day 7 and 30 after discharge.

Results: patients identified by the BRASS index as high risk are frequently not discharged home and have a longer length of stay. The BRASS-scores correlate significantly with the outcome scores after discharge: the higher the BRASS-score, the higher the difficulty score after discharge on all domains. However, the sensitivity of the BRASS index is rather low.

Conclusion: This study demonstrates that the BRASS index is a good predictor instrument for indicating patients who are not discharged home, that the BRASS scores correlate significantly with problems experienced after discharge and that it has high specificity to predict patients with problems after discharge. Clinical use, however, is limited due to the low sensitivity. The BRASS index is a promising case-finding instrument for discharge planning, but needs further development.

Key-words: BRASS index, continuity of patient care, discharge planning
elder care, hospital stay, nursing

4.1. Introduction

Discharge planning is an accepted nursing intervention aimed at the prevention of problems after discharge. It consists of a series of events that occur soon after a person is admitted to a health care setting in order to facilitate continuity of care (Kelly et al. 1992). Rorden and Taft (1990) describe discharge planning as a process involving several steps with the immediate goal of anticipating changes in patient care needs and a long-term goal of ensuring continuity of health care. The first step in discharge planning is to identify which patients are at risk for encountering problems on or after discharge. To facilitate this step, several case-finding and/or risk-screening instruments have been developed, most of which contain a list of patient characteristics (e.g. gender, age, living situation, previous hospitalization, etc...), of which previous research has shown relationship with certain post discharge problems or with the use of social services during or after hospitalization. However, Blaylock & Cason (1992) criticize the existing instruments as being neither specific enough for the elderly, nor comprehensive or practical enough for nurses to use at bedside. Therefore they developed a new instrument, the 'Blaylock Risk Assessment Screening Score' (BRASS). The first results published concerning this new instrument (Blaylock & Cason 1992, Rhoads et al. 1992) were so promising that the BRASS was chosen for clinical testing with elderly patients admitted to two hospitals in Amsterdam. This article presents data on the predictive validity of the BRASS index.

The BRASS index: a risk screening instrument

The aim of the BRASS index is to identify, shortly after hospital admission, those patients who are at risk for prolonged hospital stay and in need of discharge planning resources, in order to reduce or prevent post discharge problems.

The index contains 10 items: age, living situation/emotional support, functional status, cognition, behaviour pattern, mobility, sensory deficits, previous admissions/ER-visits, active medical problems and drugs. Each item is assessed and judged by a nurse; hereto she uses the normal diagnostic procedures and questions for nursing history taking. When using the instrument the nurse circles for each item one of the prestructured assessment options that she considers to be most appropriate for the patient.

Each option has a weight factor that represents the degree to which the characteristic affects the need for discharge planning. A total sumscore can range from 0 to 40. The index categorizes patients into three groups based on the total score. Scores ranging from 0 through 10 suggest that the patient has a low risk for having post discharge problems and thus little need for discharge planning (low-risk group). Scores ranging from 11 through 20 suggest that the patient's problems are more complicated and require extensive discharge planning to prevent problems after discharge (medium-risk group). Scores above 20 suggest that the patient's problems are so great that extensive discharge planning is required and that the patient is at risk for a discharge destination other than home (high-risk group). The instrument recommends that all patients with a score above 10 should be referred to the discharge planning team.

For this study the BRASS index was translated into Dutch; some difficulties which arose in translation were solved during discussions between the first and the last author. Content validity was checked by a Dutch expert panel consisting of two head nurses, a liaison nurse, a social worker, two nurses from the research and development departments (one from the hospital and one from the home nursing care agency) and a nurse researcher. This panel agreed that all items in the index are predictive of possible problems on or after discharge.

The Dutch version of the BRASS index was first tested in a pilot study involving 99 patients of a general medical ward, by two registered nurses preparing for their masters degree (Dooper & Witteveen 1995). They found that the instrument was easy to administer and that it only took a few minutes to complete. In that pilot study an interobserver reliability coefficient (Spearmans rho) of 0.93 ($p<0.01$) for the total score and a Cohen’s Kappa coefficient of 0.78 for the BRASS risk categories was found; this is comparable to the inter-rater reliability coefficient of 0.84 for the US version (Blaylock & Cason 1992). The internal consistency, as measured by Cronbach=s alpha coefficient, of the Dutch BRASS index found in the pilot study of Dooper & Witteveen was 0.59.

For the main study, a 1-hour session of oral instructions for using the Dutch version of the BRASS index was given to the ward nurses by the first author. These nurses also received a comprehensive printed instruction leaflet, and concise instructions were printed on the back of each form. Moreover, during the study period, the first three authors made daily rounds on each ward to collect the forms and to answers any questions the nurses had about completing the BRASS index. The usual discharge planning procedures continued during the study.

4.2. Method

Design

Different proportions in discharge destinations and differences in length of stay (LOS) between the patients of the various BRASS categories were chosen as primary indicators for predictive validity, since the developers of the instrument indicate these parameters in the explanation of the risk-categories. In addition to discharge destination and LOS, the outcome measurement focussed on problems after discharge. Post discharge problems were defined as the problems or limitations perceived by patients in their functional abilities and their general health status. Three assessment instruments were used: the Problems After Discharge Questionnaire, the Nottingham Health Profile and the COOP/WONCA charts.

A prospective longitudinal design was used with 4 measurement moments. The risk screening by the BRASS index and patient demographics were gathered on admission, discharge destination and length of stay were gathered from the hospital information system on discharge and problems experienced after discharge were measured twice by means of structured postal questionnaires 7 and 30 days after discharge.

Patients

During a 4-month period, all patients of 65 years and older who were admitted to 8 different nursing wards (7 from a university hospital and 1 from a general community hospital) were screened within 48 hours after admission by means of the BRASS index. Outcomes at discharge were measured for the same patients, but problems after discharge were measured only for the patients who were discharged home and had stayed in hospital for more than three days.

Instruments

The Problems After Discharge Questionnaire (PADQ) is a structured questionnaire that covers several domains: 'informational needs', 'functional limitations', 'physical complaints', 'emotional complaints' and 'unmet needs'. Informational needs are operationalized as the patient’s perception of not feeling well enough informed and is assessed on a 12-item scale.

Functional limitations are assessed according to the patient’s perception of the difficulties experienced in performing various activities independently. Answers can be given on a 5-point scale ranging from '1 = no difficulty at all' to '5 = not able to'. This domain is subdivided into 3 different sections: functional limitations in personal care (5 items), in household activities (7 items) and in mobility (5 items). For each section a composite 'difficulty' score is computed as the mean of the responses to the items. Physical complaints are measured on a 9-item scale. Answers can be given on a 5-point scale, varying from '1 = no trouble at all' to '5 = very much trouble'. A composite physical complaint score is computed as the mean of the responses to the 9 items. Similarly, emotional complaints are measured on a 6-item scale. Answer categories and the composite emotional complaint score are the same as for physical complaints. The theoretical range for the above-mentioned composite scores is from 1 to 5. Unmet needs are defined as the wish of a patient to have more assistance in performing certain activities, or to receive more support/advice in dealing with physical or emotional complaints. Unmet needs are measured, together with each item on the above-mentioned scales, by the question 'Would you like to have (more) help/support (in dealing) with this?'. Validity and reliability of the PADQ have been studied in several ways, and are considered to be acceptable (Mistiaen et al. 1997).

The Nottingham Health Profile (NHP) (Hunt et al. 1986) measures the actual general health status, based on 6 dimensions (physical mobility, emotional reaction, sleep, pain, energy and social isolation). It consists of 38 items, each with a dichotomous answer possibility with a weight factor. The total score for each dimension can range from 0 to 100, with '0' indicating no problems and '100' indicating the presence of all problems in that dimension.

The COOP/WONCA charts (Nelson et al. 1987) measure the patient’s own perception of his functional status and general health status during the previous two weeks. The instrument has 6 dimensions (physical fitness, emotional status, activities of daily life, social functioning, general health, changes in health status). Each dimension is operationalized in 1 question with 5 graphically illustrated answer possibilities. Each dimension is given a score, ranging from 1 to 5, with '1' indicating a good functional or health status, and '5' indicating a bad functional or health status. The COOP/WONCA charts were used only once at day 30after discharge, since they apply to the patient’s status during the previous 2 weeks.

Analysis

Analysis of the predictive validity of the BRASS index was guided by the following hypotheses:

- Patients in the BRASS low-risk category (category 1) are more frequently discharged home than patients in the BRASS higher-risk categories (categories 2 & 3)
- The mean length of hospital stay (LOS) of the BRASS low-risk patients is shorter than the LOS of the higher-risk patients
- The total BRASS scores correlate positively with the PADQ scores
- BRASS low-risk patients have lower mean scores on the PADQ, NHP and COOP/WONCA than the higher-risk patients
- More patients in the BRASS higher-risk categories have problems and unmet needs after discharge than patients in the low-risk category.

Where possible differences between the three different categories are analysed. However, due to the small number of patients in category 3, for several analyses the medium and high risk category are combined and compared with the low-risk category. This seems an acceptable approach; since categories 2 and 3 are both indicatives of patients at risk and, according to the therapeutic recommendations of the index, patients in both categories are in need of discharge planning services.

Potential bias on the outcomes, due to the use of a risk-screening instrument was checked in two ways. Firstly, the research period was divided in two halves: in the first half a BRASS index form was used which had no visible weight factors, no visible risk categories and no intervention recommenddations at the bottom of the form; in the second half the complete instrument was used. Secondly, a comparison was made of the outcomes found in each half of the research period and these were also compared with outcomes found in an earlier research project, in which no risk-screening took place (Mistiaen et al. 1997). We found that the BRASS-scores of both halves of this research period were similar and also that the outcome scores after discharge of both halves of this research period were equal. Moreover, they did not differ from the outcome scores found in the earlier research project. It is therefore assumed there was no confounding interaction between risk-screening and outcome measurement.

4.3. Results

Population characteristics

The inclusion criteria on admission (65 years and older, admitted to one of the eight participating wards) were met by 652 patients, of whom 568 were screened. The most frequent reason for not completing the BRASS forms was that some patients had already left the ward within 48 hours. The nurses found the form easy to use and it could be completed within a few minutes. Of the 568 risk forms returned, 503 (88.6%) were fully completed. Missing data were on the following items: number of previous admissions (4.2%), sensory deficits (3.3%), number of active medical problems (3.2%), date (2.6%), mobility (1.4%), age (0.7%), cognition (0.7%), behaviour pattern (0.7%), number of drugs (0.7%), living situation (0.5%) and functional status (0.4%). Therefore, a total BRASS score and a BRASS risk-category score could be computed for 503 patients.

Of the 503 patients with a fully completed BRASS index, 226 met the inclusion criteria on discharge (aged 65+, admitted to one of the 8 wards, discharged home, LOS >3 days) for receiving a post-discharge questionnaire. Of these, 133 patients (59%) returned the first questionnaire and 103 also returned the day 30 post-discharge questionnaire. Non-response reasons at day 7 were: feeling too ill, readmitted or died (35.5%), no interest in the questionnaire or no problems (25.8%), unknown or other (39.8%). Respondents and non-respondents were equally divided over the BRASS-risk categories (Pearson’s Chi-square with continuity correction = 3.59, p=0.166).

Of the 503 patients with a fully completed BRASS index, the mean age was 76.3 years (SD.= 6.63, range 65-98); 53.7% were female and 40.2% were living alone. Of the 133 respondents who returned the outcome questionnaire 7 days after discharge, the mean age was 74.4 years (SD = 6.06, range 65-89), 47.4% were female and 30.3% were living alone.

The BRASS scores are a skewed distribution and varied between 1 and 31, with a median of 7 and a mean of 9.16 (SD = 6.47). Of the screened patients, 69.6% were in the low-risk category, 21.3% in the medium-risk category and 9.1% in the high-risk category.

Predictive validity

Our first expectation that patients in the BRASS low-risk category would be discharged home more frequently than patients in the BRASS medium or high-risk categories, was supported. Ninety two percent of the patients in the BRASS low-risk category were discharged home, contrasting to 56% and 35% in the medium-risk and high-risk categories, respectively (Pearson's Chi-square with continuity correction = 125.3, $p<0.001$).

The second hypothesis, that the mean LOS of the BRASS low-risk patients would be shorter than that of the higher risk patients, was also supported. The mean LOS for patients in BRASS category 1, was 9.64 days, and is significantly (One way Anova, F= 25.85, $p<0.001$) shorter than the LOS of 20.75 days for category 2 patients or the LOS of 25.54 days for category 3 patients. The LOS of category 2 patients is not significantly lower than that of category 3 patients.

Thirdly, the BRASS total score correlates significantly ($p<0.05$) in a positive direction (the higher the risk-score, the higher the difficulty score) with all difficulty scores after discharge on all domains at day 7 and at day 30, with Spearman's correlation coefficients varying between 0.33 and 0.53 (Table 4.1).

Table 4.1 Spearman correlation coefficients between total BRASS scores & PADQ-scores (* = $p<0.05$)

Time after discharge **PADQ-dimension**	**7 days (N=133)**	**30 days (N=103)**
Difficulty personal care	0.53*	0.46*
Difficulty housekeeping	0.35*	0.38*
Difficulty in mobility	0.46*	0.46*
Physical complaint	0.40*	0.42*
Emotional complaint	0.33*	0.36*

The fourth hypothesis, concerning significant differences between the various BRASS categories in problems after discharge scores and in health status scores, was supported for 10 out of 12 outcome-measures 7 days after discharge and for 15 out the 18 outcome-measures 30 days after discharge (Table 4.2). In general, higher-risk patients have higher mean difficulty scores than low risk-patients (Mann-Whitney U-test).

Table 4.2 Mean outcome scores 7 & 30 days after discharge per BRASS-category

Instrument	Dimensions	Day after discharge	BRASS 1 n=111 (7) n=89 (30)	BRASS 2/3 n=22 (7) n=14 (30)	significance
PADQ	Informational needs[1]	7	3.86	4.50	-
		30	2.44	2.00	-
	Personal care[2]	7	1.43	2.72	*
		30	1.26	2.45	*
	Housekeeping[2]	7	2.50	4.12	*
		30	1.96	3.55	*
	Mobility[2]	7	2.01	3.63	*
		30	1.77	3.19	*
	Physical complaints[2]	7	1.72	2.42	*
		30	1.65	2.34	*
	Emotional complaints[2]	7	1.61	2.19	*
		30	1.44	1.98	*
NHP	Physical mobility[3]	7	26.79	58.03	*
		30	25.17	52.77	*
	Pain[3]	7	17.43	46.06	*
		30	16.32	33.92	*
	Sleep[3]	7	22.17	19.14	-
		30	22.44	16.49	-
	Energy[3]	7	36.22	57.69	*
		30	37.23	58.69	-
	Social interaction[3]	7	8.69	21.03	*
		30	5.57	17.96	*
	Emotional reaction[3]	7	9.76	26.48	*
		30	7.10	21.72	*
COOP/ WONCA	Physical fitness[2]	30	3.31	4.23	*
	Emotional status[2]	30	1.93	2.57	*
	ADL[2]	30	2.65	3.93	*
	Social activities[2]	30	2.14	2.86	*
	Changes in health status[2]	30	2.24	2.29	-
	General health[2]	30	3.12	3.79	*

[1]= theoretical range 0-12
[2]= theoretical range 1-5
[3]= theoretical range 0-100

Mann-Whitney U-test
*p<0.05
-= not significant

Not only did the mean outcome scores differ over the various BRASS-categories, but we also found that 7 days after discharge a higher percentage of patients in the higher-risk categories reported problems and unmet needs than patients in the low-risk category (Pearson's chi-square with continuity correction, p <0.050), in accordance with our fifth hypothesis (Table 4.3).

Table 4.3 Frequency of having difficulty/unmet needs at day 7 per BRASS category (n=133)

PADQ-dimensions one week after discharge	**BRASS cat 1**	**BRASS cat2/3**	**Significance[3]**
Personal care			
% with difficulty[1]	41.8	95.2	*
%with unmet need[2]	15.2	45.0	*
Housekeeping			
% with difficulty[1]	74.5	100	*
%with unmet need[2]	26.6	36.8	-
Mobility			
% with difficulty[1]	72.1	100	*
%with unmet need[2]	10.0	42.1	*
Physical complaints			
% with difficulty[1]	93.7	100	-
%with unmet need[2]	18.3	50.0	*
Emotional complaints			
% with difficulty[1]	56.0	84.2	*
%with unmet need[2]	23.0	31.3	-

[1]= % of total of that category
[2]= % of those patients from that category with difficulty
[3]= Pearson's chi-square with continuity correction;
*=p<0.05
-= not significant

One week after discharge, relatively more higher-risk patients stated that they had difficulty with personal care, housekeeping and mobility than low-risk patients. Concerning unmet needs, higher-risk patients mentioned this more frequently with regard to personal care, mobility and physical complaints 7 days after discharge. For instance, 95% of the patients in the higher-risk group reported difficulty with personal care, compared with only 42% of the patients in the low-risk group; and 45% in the high-risk group reported having unmet needs in personal care, compared with 15% in the low-risk group. A similar difference pattern was found for the other dimensions. When these analyses are applied to the data of 30 days after discharge, the same pattern emerges, but a statistically significant difference is only found for more higher-risk patients experiencing difficulty with personal care and for more higher-risk patients with unmet needs in the mobility dimension. This may be due to the relatively small number of patients in the groups.

Finally, we studied the sensitivity (true positive/ true positive + false negative) and specificity (true negative/ true negative + false positive) characteristics of the BRASS index in identifying patients with problems or unmet needs after discharge (Table 4.4).

With the original cut-off score of 10, the sensitivity coefficients for having problems and having unmet needs in the various domains on day 7 after discharge varied from 0.16 to 0.30 for problems, and from 0.25 to 0.56 for unmet needs. This implies that there is a relatively high percentage of patients who have problems or unmet needs are categorized in the low risk group. On the other hand, specificity coefficients are high, varying from 0.94 to 1.00 for problems, and from 0.78 to 0.89 for unmet needs, which implies that most patients that were categorized by the BRASS as high risk, do, indeed, have problems after discharge.

Optimizing the sensitivity/specificity balance by receiver operating characteristics analysis (Lindelow *et al.* 1997) give different optimal cut-off scores depending on the outcome chosen. For instance, optimal sensitivity/specificity balance for predicting overall unmet needs at day 7 (sensitivity 0.68, specificity 0.72) is reached with a cut-off score of 5, for having difficulty in personal care optimal balance (sensitivity 0.60, specificity 0.63) is at cut-off score of 4, and a cut-off score of 9 gives a optimal sensitivity/specificity balance (sensitivity 0.76, specificity 0.75) for predicting a discharge destination other than home.

In summary, from the results of this research, all our expectations concerning the predictive validity of the BRASS index were supported, but the sensitivity of the BRASS index with the original cut-off score was found to be rather low.

Table 4.4 Sensitivity/specificity coefficients of the BRASS index, with the original cut-off score of 10, related to problems after discharge (n=133)

PADQ-dimensions at day 7	sensitivity	specificity
Personal care		
Trouble	0.30	0.98
Unmet	0.56	0.78
Housekeeping		
Trouble	0.19	1.00
Unmet	0.25	0.83
Mobility		
Trouble	0.19	1.00
Unmet	0.50	0.87
Physical complaints		
Trouble	0.16	1.00
Unmet	0.34	0.89
Emotional complaints		
Trouble	0.21	0.94
Unmet	0.26	0.81
Overall unmet	0.30	0.93

4.4. Discussion and conclusion

The Dutch version of the BRASS index is an easy to use instrument, and has acceptable content validity and reliability properties. We found good indications for the predictive validity of the BRASS index: high-risk patients are frequently not discharged home, the BRASS total score correlates well with the problem scores after discharge, and higher-risk patients report a lower functional and health status after discharge.

However, the BRASS index has low sensitivity to identify patients who have problems or unmet needs after discharge, and may therefore have been in need of discharge planning services an have missed it. These findings can be explained by the fact that many elderly patients lose functional status during an extended hospital stay, but on admission they would not have been identified as being in need of discharge planning. This increase in problems and needs during the hospital stay might only be identified if ongoing assessments are made. Repeated measurements during hospitalization of the various aspects of the BRASS index could help to identify those patients who screen out after their initial admission.

Sensitivity/specificity balance can be improved by choosing other cut-off scores, but these vary depending on the outcome that is chosen.

The practical implication of these results is that the BRASS index, with the original cut-off score should be used with some caution for individual patient policy in clinical practice, since patients with problems after discharge could be screened out by the BRASS, especially if it is administered only once immediately after admission. More research based on several risk-screening moments during hospitalization is to see if the sensitivity of the BRASS index can be enhanced. Moreover, further research is needed to study (the weight factors of) the various items of the BRASS index and on the predictive validity in more homogenous populations.

Finally, as was mentioned in the introduction, several other risk-screening instruments have been developed all with their own advantages and disadvantages. Although we consider the BRASS index to be appropriate for application in a clinical setting, this research does not indicate which of the risk-screening instruments is most effective, since no comparisons have been made. This should be the subject of future research.

Moreover, this research has not investigated whether the BRASS index is more effective in particular groups of patients. Although the study population included various diagnostic categories and a number of nursing wards, the size of each was too limited to do sensitive sub-analyses on the predictive validity. For this purpose, much larger sample sizes are needed.

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5

A randomized trial of a Telephone Reassurance Programme for patients recently discharged from an ophthalmic unit

Boter H, Mistiaen P, Groenewegen I: **A randomized trial of a Telephone Reassurance Programme for patients recently discharged from an ophthalmic unit.** *J Clin Nurs 2000;* ***9****: 199-207*

Summary

- Patients often experience problems after discharge, for instance with housekeeping or a general lack of information.
- The effect of a nurse-initiated Telephone Reassurance Programme (TRP) on ophthalmic patient outcomes was investigated.
- Patients in the intervention group were phoned by a nurse 3-6 days after being randomized and discharged home.
- Patients in both intervention and control groups received a questionnaire 1 week and 1 month after discharge to assess the patient outcomes ‘Informational needs’, ‘Uncertainty’, ‘Emotional complaints’ and ‘Functional limitations’.
- In an attempt to explain the lack of statistically significant results, the limitations related to the participants, intervention and outcomes are discussed.

Keywords: continuity of care, ophthalmic patients, patient discharge, post-discharge problems, randomized controlled trial, Telephone Reassurance Programme.

5.1. Introduction

Patients, including ophthalmic patients, are at risk for being discharged without adequate preparation for self-management at home. This is partly the result of medical and technological developments and financial constraints that restrict the period of hospitalization and the time available for making adequate and comprehensive discharge preparations. In addition, patients do not always ask the necessary questions when they are in a hospital (Van Beelen, 1996), or they forget the information they had been given (Tierney *et al.*, 1994). Another difficulty is that it is sometimes difficult to estimate the extent to which a patient will be self-supporting after discharge (Arenth & Mamon, 1985).

Although nurses try to prepare patients adequately for discharge, they do not always succeed. A number of studies indicate that some patients do, indeed, have problems after discharge. For example, the results of a study among 145 elderly patients who had recently been discharged indicated that 79% of the patients did not feel that they had been adequately informed, 77% had difficulties with housekeeping and almost 40% of the patients had one or more unmet needs (Mistiaen *et al.*, 1997). Other studies also found that post-discharge problems existed: concerns related to the patient's progress and how much activity is good (Boyle *et al.*, 1992), whilst unmet needs related to treatment, activities and other aspects of self-sufficiency (Mamon *et al.*, 1992), informational needs (McWilliam & Sangster, 1994), financial concerns, family/relationship problems (North *et al.*, 1991), and difficulties related to going out, sleeping, taking medicine, washing and bathing, pain, fatigue and feeling ill (Tierney *et al.*, 1994). Comparable results are also found among ophthalmic patients (Smith & Drance, 1984, Allen & Oberle, 1993; Law, 1997; Boter *et al.*, 1998a).

Care institutions try to address post-discharge problems in several ways. For example, a home care preoperative teaching programme (Allen *et al.*, 1992), a transitional home follow-up by nurse specialists (Brooten *et al.*, 1988), a comprehensive discharge planning protocol (Kennedy *et al.*, 1987; Naylor, 1990; Naylor *et al.*, 1994), a (patient or nurse-initiated) telephone call-back system (Young, 1990; Siegel, 1992; Wachter, 1995; Shu *et al.*, 1996), hospital discharge planning staff (Mamon *et al.*, 1992; Peters *et al.*, 1997), and home visits by community nurses (van Harteveld *et al.*, 1997).

In order to determine what kind of intervention could to prevent post-discharge problems on a participating ophthalmic unit, studies comparing the effectiveness of interventions are needed. Unfortunately, these studies are scarce, and those that are available do not recommend any specific intervention. For example, Barnason and Zimmerman (1995) compared three teaching programmes (an inpatient teaching programme, a post-discharge telephone follow-up programme and a post-discharge group teaching programme) and found similar patient teaching outcomes, regardless of the type of teaching programme the patients were involved in. In another study, two systems of telephone follow-up, a nurse-initiated and a patient-initiated telephone programme were compared with a third group of patients receiving no intervention. Although no differences were found in patient satisfaction with the health education, the results suggested that patients are unlikely to actively seek the information they need (Bostrom *et al.*, 1996). In conclusion, not for scientific but for pragmatic reasons, we initiated a community-oriented, nurse-initiated Telephone Reassurance Programme (TRP) during which patients who had recently been discharged were phoned at home. The most important pragmatic reasons were phoned this method is relatively cheap, patients do not have to come to the hospital (e.g. for teaching) and patients can be telephoned from the ward during quiet periods.

Studies concerning nurse-initiated TRPs often only describe the problems mentioned by the patients or the interventions subsequently applied by the nurse who made the phone call. The problems patients mention during a call are, for instance, health problems and social problems (Bowman *et al.*, 1994), problems concerning safety and medication (Closson *et al.*, 1994), and difficulty in accepting the changed health status, concern about financial difficulties and uncertainty (Keeling & Dennison, 1995). Nursing interventions subsequently applied by the nurse are, for example, guidance and support (Cave, 1989; Orticio & Swan, 1992; Closson *et al.*, 1994; Keeling & Dennison, 1995; Turner, 1996), instruction (Shesser *et al.*, 1986; Orticio & Swan, 1992; Keeling & Dennison, 1995), referral to a physician or other caregivers (Shesser *et al.*, 1986; Orticio & Swan, 1992; Keeling & Dennison, 1995), and teaching (Cave, 1989; Phillips, 1993).

In a few studies the effectiveness of a nurse-initiated TRP has been tested. Positive effects were found on the patient’s knowledge of the disease, recommended exercises and all teaching areas together but no effects were found on knowledge of diet, medication, restrictions in physical activity or rest (Garding *et al.*, 1988). In another study, male patients who received a follow-up telephone call had a more positive perception of their visit to the Emergency Department than male patients who did not participate in the

TRP (Shesser *et al.*, 1986). Finally, Phillips (1993) found no difference on the variable ‘quality of life’ between patients who were called and those who were not.

In conclusion, little is known about the effect of a nurse-initiated TRP on post-discharge problems, so we decided to study this effect. We also wanted to study both the short-term and the long-term effects of the TRP.

The objective of this study was to answer the following research question: What is the effect of a nurse-initiated TRP on post-discharge problems reported by recently discharged ophthalmic patients?

5.2. Method

Intervention

Patients in the intervention group were phoned 3-6 days after discharge by an experienced nurse. Before calling, the nurse went through a structured form containing relevant information about the patient’s admission and discharge conditions (e.g. living situation, ophthalmic diagnoses and treatment, and description of the treated eye). These forms were prepared during hospitalization for all included patients.

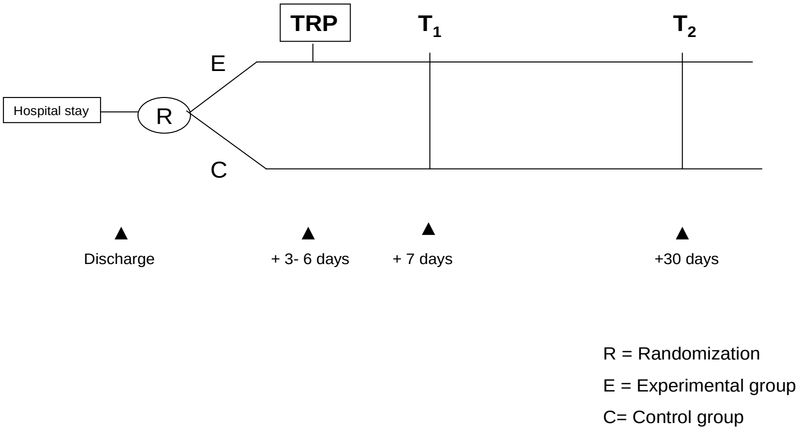
During the call, the nurse used a structured interview schedule which was attached to the form. The interview schedule covered ten aspects. Examples of these aspects are: ‘How is your treated eye?’ and ‘Is there anything else you would like to know about your treatment?’ All aspects included in the interview schedule were discussed with the patient, if relevant. If a patient mentioned a problem or asked a question, the nurse could compare this with the information on the form and intervene. In decreasing order, giving reassurance, referring to a medical doctor, and giving information, advice or instructions were the most frequently applied nursing interventions (Boter e*t al.*, 1998a), for example, by giving information or reassurance.

To make effects of the intervention more likely to be the results of the intervention itself than of the personal contribution of a single nurse, six nurses participated in the project.

Design

A randomized clinical trial was carried out with a post-test only design (Figure 5.1). The two times of measurement were 7 days (T_1) and 30 days (T_2) after discharge. The second time of measurement, 30 days after discharge, was chosen because we still expected to find a smaller but significant effect at that time. Patients in the intervention group participated in the TRP, in addition to receiving conventional discharge treatment. Patients in the control group received only the conventional discharge treatment.

Figure 5.1 Trial design



Subjects

The study included Dutch-speaking, adult ophthalmic patients who had been treated and hospitalized for at least two days in the period from March to November 1997 on the participating ophthalmic ward of the University Hospital Vrije Universiteit in Amsterdam, The Netherlands. Patients were excluded if they were admitted from another nursing ward or care institute before they were hospitalized, or were discharged to institutional care. Patients with no telephone, or those who were not able to answer the phone (for example because of hearing problems) and had no one else to answer it, were also excluded.

Procedures

Approval was obtained from the ethics review board and two scientific committees of the study hospital before starting recruitment. Patients who met the inclusion criteria were informed about the project and invited to participate. All patients were provided with the routine information and conventional care before and on discharge. Immediately after discharge, patients from whom consent was obtained were randomized to the intervention or the control group by an independent researcher. Patients in the intervention group received a letter signed by the head nurse, informing them about the telephone call. Patients were sent a questionnaire 5 or 6 days after discharge and an identical questionnaire was sent on the 28th day. If the successive questionnaires were not returned before the 11th day or the 35th day after discharge, respectively, the researcher reminded the patients by telephone. It should be noted that patients in the intervention group only received the 7th-day questionnaire if they were phoned in time, and patients in both groups only received the 30th-day questionnaire if the 7th-day questionnaire was returned within 14 days after discharge.

Outcomes

To cover a broad range of (potential) post-discharge problems, the following patient outcomes were measured: 'Informational needs', 'Uncertainty', 'Emotional complaints' and 'Functional limitations'.

- 'Informational needs', i.e. the patient's perception of not being sufficiently informed, was measured by means of a newly developed instrument. The instrument included 39 items and the content was based on the Patient Learning Need Scale (PLNS: Bubela *et al.*, 1990). It is a general instrument that can be used among divergent patient populations. Factor analysis indicated a strong central factor suggesting an unidimensional scale. Examples of the items included are: 'Last week, did you need more information about: when you can take a bath or shower?' or 'How you can prevent a complication from occurring?'. Respondents could indicate by answering '0=no' or '1=yes', according to whether or not they felt adequately informed. The scale yields a total score with a minimum score of zero (no informational needs) and a maximum score of 39 (maximum amount of informational needs). The Cronbach's α in the present study was 0.95.
- 'Uncertainty', i.e. the patient's inability to determine the meaning of illness-related events, was measured by means of a translated version of the Mishel Uncertainty in Illness Scale - Community form (MUIS-C; Mishel, 1981). This instrument is used for patients who are not hospitalized and are not likely to be receiving medical intervention (Mishel, 1990). This one-factor scale includes 23 items and is measured on a five-point scale ranging from 'strongly disagree' to 'strongly agree', with items worded in both directions. The total scores for 'Uncertainty' can range from 23 (low uncertainty) to 115 (high uncertainty). The

MUIS-C is based on the MUIS, which has been validated for both divergent and convergent validity and has proved to be very sensitive to differences in clinical population samples (Mishel, 1990). The Cronbach's α in the present study was 0.91.

- 'Emotional complaints' were measured by means of a dimension of the Problems After Discharge Questionnaire (PADQ; Mistiaen *et al.*, 1997). This dimension is based on a 5-point scale, varying from '1=no trouble at all' to '5=very much trouble'. It includes six items related to a patient's feelings: lonely, restless, sad, anxious, uncertain and worried. The mean scores can range from 1 to 5. The Cronbach's α in the present study was 0.91.
- 'Functional limitations' were measured by means of another dimension of the PADQ. It was used to assess the problems respondents perceived in performing daily activities independently. The dimension was scored on a five-point scale, ranging from '1=no difficulty at all' to '5=not able to'. It covers three areas: personal care (five items: washing hands, taking a bath or shower, dressing, combing hair, and eating and drinking), with a Cronbach's α of 0.80 in the present study; housekeeping (seven items: preparing meals, shopping, heavy housework, laundry, making beds, washing dishes, light housework), with a Cronbach's α of 0.94; and mobility (five items: getting out of bed, going to the toilet, climbing stairs, walking outdoors, travelling), with a Cronbach's α of 0.81. All mean scores can range from 1 to 5. The dimensions 'Emotional complaints' and 'Functional limitations' were developed by Mistiaen *et al.*, (1997), who used the dimensions in an earlier study on post-discharge problems. Both dimensions were assessed for content validity (Mistiaen *et al.*, 1997). To find evidence of criterion-related validity, the dimensions were assessed against the BRASS-index. The aim of the BRASS-index is to identify, shortly after admission, those patients who are at risk for prolonged hospitalization and are in need of discharge planning resources in order to reduce or avoid post-discharge problems (Blaylock & Cason, 1992). Tests revealed that both dimensions correlated, as was expected (Mistiaen *et al.*, submitted).

The four outcomes were combined in a postal questionnaire. It was pilot-tested on five hospitalized ophthalmic patients, after which amendments (e.g. on readability) were made. Subsequently, for a period of one month, the whole procedure (including the intervention and the postal questionnaires) was pilot-tested on patients who met the inclusion criteria (N = 79), after which the form, the interview schedule and the questionnaire were again improved.

Data Analysis

Independent-Samples *t*-Tests (on 'Uncertainty') and Mann-Whitney *U*-Tests (on the other, not normally distributed, outcomes) were used to determine the differences between the intervention and the control group. The Statistical Package for the Social Sciences (SPSS) was applied for all tests, using a significance level of 0.05 (two-tailed).

5.3. Results

Participants

During the research period, 559 patients were admitted. In all, 134 patients were excluded because, for example, they had been discharged to institutional care (n = 46), admitted from or transferred to another unit (e.g. Emergency Department; n = 41), or they had received no medical treatment (n = 15).

Among the 425 patients who met the inclusion criteria, 31 patients were unwilling to participate. Those who were unwilling to participate and the remaining 394 patients did not differ with respect to age, gender or length of hospital stay. A total of 196 patients was randomly assigned to the intervention group and 198 to the control group. In the intervention group, 183 patients were phoned in time (mean score 3.9 days after discharge; mode 3 days). Patients who were called too late, or were not contacted at all, were younger than those who were called in time: 55.1 (SD 16.1) years vs 65.7 (SD 16.6), $p < 0.05$). No differences were found on the variables gender or length of hospital stay.

Subsequently, the 7th-day questionnaire was completed by 143 patients in the intervention group and 154 patients in the control group, within 14 days after discharge (response 78% in both groups). Reasons for non-response to the first questionnaire were: 'not feeling like completing a questionnaire' (16%), 'feeling too ill' (9%), 'having no problems' (7%), 'being readmitted' (5%), 'other' (11%) and 'unknown' (52%).

Within 42 days after discharge, 113 patients in the intervention group and

127 patients in the control group completed the 30th-day questionnaire (response 62% and 64%, respectively). Reasons for non-response to the second questionnaire were: ‘feeling too ill‘ (10%), ‘being readmitted‘ (10%), ‘having no problems‘ (6%), ‘not feeling like completing a questionnaire‘ (4%), ‘other‘ (23%) and ‘unknown‘ (46%). Patients who responded to both questionnaires differed on the outcomes from those who returned only the 7th-day questionnaire. It was found that the respondents in the intervention group, who completed the 7th-day but not the 30th-day questionnaire, scored significantly higher on all 7th-day outcome measures than patients in the same group who returned both questionnaires. This indicates that the patients in the intervention group who returned only the 7th-day questionnaire had more problems one week after discharge than those who returned both questionnaires. Among the patients in the control group the same difference was found on ‘Uncertainty‘.

The mean time-lapse between discharge and completion of the 7th- and 30th-day questionnaires was 8.1 days (SD = 2.4) and 31.8 days (SD = 3.2), respectively.

The 297 respondents to the 7th-day questionnaire and the 84 non-respondents did not differ on the variables age, gender or length of hospital stay. Furthermore, the 240 respondents and the 154 non-respondents to the 30th-day questionnaire did not differ on the variables age or length of hospital stay. However, men more often completed the questionnaire than women ($p<0.01$).

General baseline characteristics of the respondents are shown in Table 5.1. No differences were found between the respondents of the intervention and the control group in relation to these characteristics. However, patients in the intervention group, who responded to the 30th day questionnaire, had a longer hospital stay than those in the control group (4.1 (SD 2.5) days vs 3.5 (SD 2.2); $p<0.05$). Analysing the results, ‘length of hospital stay’ was not used as a covariate because it had low correlations with the outcomes (range 0.06-0.17).

Most patients were treated for cataract (43%), glaucoma (15%), retina disorders (14%), or cornea disorders (13%).

Table 5.1 Baseline characteristics of respondents to the 7th-day questionnaire

	All patients (n = 297)	
Sociodemographic characteristics:		
- Mean age (SD)	66.6	(16.1)
- Female (%)	56.9	
- Living alone (%)	38.2	
Mean length of hospital stay (SD)	3.9	(2.9)
Admission(s) in previous two years for ophthalmic treatment (%)	35.2	
Self-supporting in ADL and/or IADL (%)	92.9	
Having home help and/or home nursing (%)	14.1	

Impact of the intervention

No differences were found on the outcomes between patients in the intervention group and those in the control group one week after discharge (Table 5.2).

Table 5.2 Comparison of mean scores between the intervention group and the control group on the 7th day questionnaire (SD)

	theoretical range	intervention (N=143)		control (N=154)	
		Mean	SD	Mean	SD
Informational needs	0-39	4.59	(6.69)	5.35	(7.34)
Uncertainty	23-115	49.42	(14.42)	49.93	(15.81)
Emotional complaints	1-5	1.70	(0.81)	1.64	(0.81)
Functional limitations:					
- Personal care	1-5	1.24	(0.54)	1.32	(0.65)
- Housekeeping	1-5	2.31	(1.22)	2.42	(1.31)
- Mobility	1-5	1.65	(0.82)	1.80	(0.96)

Note. The higher the score, the more problems

Again 30 days after discharge no differences were found, except for housekeeping. Patients in the intervention group had fewer problems with housekeeping than patients in the control group:1.40 (SD 0.78) vs 1.69 (SD 1.09); $P < 0.05$.

Though practically no differences were found between the two groups, the TRP might have had an influence on the degree to which the outcome scores decline during the first month after discharge (Table 5.3). However, here again no differences were found between the results of the patients who participated in the TRP and those who did not.

Table 5.3 Decline of mean scores between 1 week and 1 month after discharge (SD)

	7th day questionnaire minus 30th day questionnaire			
	Intervention (n = 113)		**Control (n = 127)**	
	Mean	**SD**	**Mean**	**SD**
Informational needs	0.41	(5.61)	2.17	(5.12)
Uncertainty	1.91	(11.16)	1.15	(9.38)
Emotional complaints	0.14	(0.53)	0.18	(0.60)
Functional limitations:				
- Personal care	0.11	(0.42)	0.12	(0.32)
- Housekeeping	0.66	(0.77)	0.63	(0.84)
- Mobility	0.21	(0.49)	0.18	(0.46)

Subgroup analyses

Subgroup analyses were carried out in order to determine wether the TRP helped to reduce the post-discharge problems of specific patient groups. For example, the outcomes of male patients in the intervention group were compared with those of male patients in the control group. However, no effects of the intervention were found when comparisons were made with regard to gender, age, length of hospital stay, ophthalmic diagnoses, living situation and history of admission.

5.4. Discussion

A randomized clinical trial was carried out to evaluate a nurse-initiated Telephone Reassurance Programme for ophthalmic patients who had recently been discharged. Seven and 30 days after discharge, outcomes (Informational needs, Uncertainty, Emotional complaints and Functional limitations) revealed no differences between patients who participated in the programme and patients who did not, except for housekeeping. Patients in the intervention group had fewer problems with housekeeping 30 days after discharge. Nevertheless, the clinical relevance of this significant difference is minimal, and it might also be the result of a Type I error. The results of the present study are partially supported by the findings of other studies on the effect of this type of programme. Garding *et al.* (1988) found a few positive effects, namely on the patient's knowledge of the disease, recommended exercises, and all teaching areas together. Shesser *et al.* (1986) reported that only male patients evaluated their visit to the Emergency Department in combination with the TRP more positively, compared to men who did not participate in the TRP. No effects were found by Phillips (1993) on 'quality of life'.

Since no effects were found in the present study, it is important to discuss the limitations of the study before it is concluded that, in general, a TRP does not reduce post-discharge problems.

Firstly, some points are made about the participants. To be included in the study, patients had to be alert and admitted from and discharged to their home. On these grounds, some of the patients who might have benefited most from the TRP were excluded, for instance those who came from an Emergency Department. In addition, other categories of patients who have had more serious treatment (e.g. heart surgery or chemotherapy) might have benefited more from the TRP. Finally, bias is introduced by the fact that the patients who responded to both questionnaires differed on the outcomes from those who returned only the 7th-day questionnaire.

The outcomes measured may also be a limitation of the study. Due to a general lack of theoretical knowledge about the prevention of post-discharge problems by introducing a TRP, it is possible that the TRP affects outcomes other than those measured. Additionally, it is possible that the instruments used were not sensitive enough to detect small differences between the two groups. For example, 'Informational needs' was not measured with an instrument that was specifically developed for ophthalmic patients and we found some floor-effects on 'Emotional complaints', 'Personal Care', and 'Mobility'. Furthermore, we did not compare the groups on a variable such as 'stressful life events' or 'coping'. Other than hospitalization, major changes in a patient's life might influence the possible effects of the TRP. Furthermore, the intervention might have had an adverse effect on 'Uncertainty' and 'Emotional complaints' for some patients. For instance, the coping strategy 'denial' is used by some patients to deny the situation they are in, and the TRP might have reminded them of their problems, thus increasing their worries and distress.

The intervention itself might also be a reason why no effects were found in favour of the TRP. The 'intervention dose' might have been too low to achieve the intended outcomes. The nurses were not specifically trained in telephone assistance. The main reason for making this decision was that we wanted to make the programme easily applicable for other units, and only experienced nurses phoned the patients at home.

In addition, a few more comments should be made about the intervention. The lack of training might have resulted in nurse-related differences in the content and quality of the telephone calls. However, the nurses discussed their telephone calls and informed each other about the post-discharge problems mentioned by the patients and the interventions they subsequently applied. Secondly, the analysis revealed no differences between the outcomes of the patients groups who were called by different nurses. Another potential problem was that the intervention was not stable: the knowledge nurses had about post-discharge problems increased during the period in which they phoned the patients. Patients in the intervention group who were included in the study in October or November 1997 were called by nurses who had more experience with the TRP than patients in the same group who were discharged in March or April 1997. Here again, the analysis revealed no differences on the outcomes between patients who were called early in the study and those who were called later. Finally, nurses who called the patients after discharge discussed their TRP-related experiences with other nurses from the unit. It is possible that during the study all nurses from the unit paid increased attention to the prevention of post-discharge problems by preparing all admitted patients more adequately before discharge. However, this also showed no trend.

Despite the lack of significant results, a positive side-effect of the TRP was that, as nurses reported, future patients might benefit from the increasing knowledge nurses have about post-discharge problems and the improvements they made, for example, in their teaching strategies. In addition, the patients in the intervention group appreciated the TRP. For instance, 89% of the patients wanted to be called again after hospitalization and only 6% reported that they considered the call to be unnecessary (Boter *et al.*, 1998a).

We recommend that in future research the variable ‘stressful life events’ should be included as a possible modifier of the TRP’s impact. Additional research is also needed to assess the contribution of the TRP in decreasing the use of health care services or improving satisfaction with the care provided. Furthermore, we suggest that the effect of the TRP on patient outcomes should be studied among other, more critically ill, patient groups.

Appendix: Interview schedule used during the intervention.

1. How are you?
2. How is your treated eye?
3. How are you coping with cleaning your eye, putting in eye-drops / using ointment?
4. How are you coping with the following instructions?
    - Not to rub the treated eye, bend down or lift;
    - To wear an eye shield at bedtime.
5. How are you coping with performing self-care tasks and running your household?
6. How is the home nursing or home help you receive? (*if relevant*)
7. Is there anything else you would like to know about your treatment?
8. Would you like to know more about this? (*if the patient thinks the diseases or treatment will affect his/her life*)
9. Do you know what you can do if you need more information?
10. Is there anything else you would like to ask or discuss?

Acknowledgements

The authors wish to acknowledge the contributions to the research made by the nursing staff: Lisanne Meijers, Lydia van Voorthuizen, Lucia van Thol, Joyce Jansen and Jola Schutte. We also thank Anneke Veeger (staff member, Nursing Development Office) and Annemieke Zeegers (researcher) for their help.

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Part 3

Reflective systematic literature reviews on discharge interventions

Chapter 6:
Telephone follow-up, initiated by a hospital-based health professional, for postdischarge problems in patients discharged from hospital to home: a systematic review

Chapter 7:
Interventions aimed at reducing problems in adult patients discharged from hospital to home: a systematic meta-review

6

Telephone follow-up, initiated by a hospital-based health professional, for postdischarge problems in patients discharged from hospital to home: a systematic review

Mistiaen P, Poot E: **Telephone follow-up, initiated by a hospital-based health professional, for postdischarge problems in patients discharged from hospital to home.** *Cochrane Database Syst Rev, 2006,* ***4,*** *CD004510*

Abstract

Background

It is known that many patients encounter a variety of problems in the first weeks after they have been discharged from hospital to home. In recent years many projects have addressed discharge planning, with the aim of reducing problems after discharge. Telephone follow-up (TFU) is seen as a good means of exchanging information, providing health education and advice, managing symptoms, recognising complications early, giving reassurance and providing quality aftercare service. Some research has shown that telephone follow-up is feasible, and that patients greatly appreciate such calls. However, at present it is not clear whether TFU is also effective in reducing postdischarge problems.

Objectives

To assess the effects of follow-up telephone calls in the first month post discharge, initiated by hospital-based health professionals, to patients discharged from hospital to home.

Search strategy

We searched the following databases from their start date to July 2003, without limits as to date of publication or language: the Cochrane Consumers and Communication Review Group's Specialised Register, the Cochrane Central Register of Controlled Trials (CENTRAL, The Cochrane Library), PubMed, EMBASE (OVID), BiomedCentral, CINAHL, ERIC (OVID), INVERT (Dutch nursing literature index), LILACS, Picarta (Dutch library system), PsycINFO/ PsycLIT (OVID), the Combined Social and Science Citation Index Expanded (SCI-E), SOCIOFILE.

We searched for ongoing research in the following databases: National Research Register (http://www.update-software.com/nrr/); Controlled Clinical Trials (http://www.controlled-trials.com/); and Clinical Trials (http://clinicaltrials.gov/). We searched the reference lists of included studies and contacted researchers active in this area.

Selection criteria

Randomised and quasi-randomised controlled trials of TFU initiated by a hospital-based health professional, for patients discharged home from an acute hospital setting. The intervention was delivered within the first month after discharge; outcomes were measured within 3 months after discharge, and either the TFU was the only intervention, or its effect could be analysed separately.

Data collection and analysis

Two review authors independently assessed studies for inclusion and for methodological quality. The methodological quality of included studies was assessed using the criteria from the Cochrane Effective Practice and Organisation of Care Review Group. The data-extraction form was based on the template developed by the Cochrane Consumers and Communication Review Group. Data was extracted by one review author and checked by a second author. For as far it was considered that there was enough clinical homogeneity with regard to patient groups and measured outcomes, statistical pooling was planned using a random effects model and standardised mean differences for continuous scales and relative risks for dichotomous data, and tests for statistical heterogeneity were performed.

Main results

We included 33 studies involving 5110 patients. Predominantly, the studies were of low methodological quality. TFU has been applied in many patient groups. There is a large variety in the ways the TFU was performed (the health professionals who undertook the TFU, frequency, structure, duration, etc.). Many different outcomes have been measured, but only a few were measured across more than one study. Effects are not constant across studies, nor within patient groups. Due to methodological and clinical diversity, quantitative pooling could only be performed for a few outcomes. Of the eight meta-analyses in this review, five showed considerable statistical heterogeneity. Overall, there was inconclusive evidence about the effects of TFU.

Authors’ conclusions

The low methodological quality of the included studies means that results must be considered with caution. No adverse effects were reported. Nevertheless, although some studies find that the intervention had favourable effects for some outcomes, overall the studies show clinically-equivalent results between TFU and control groups. In summary, we cannot conclude that TFU is an effective intervention.

Plain language summary

Telephone follow-up after hospital discharge is not proven to be effective.

Many patients encounter a variety of problems in the first weeks after they have been discharged from hospital to home. Telephone follow-up, initiated by hospital-based health professionals, is considered to be as being a good means of exchanging information, providing health education and advice, managing symptoms, recognising complications early and giving reassurance to patients after discharge. Some research has shown that telephone follow-up is feasible, and that patients appreciate such calls. However, until now it was not clear whether telephone follow-up is also effective. Our systematic review identified 33 relevant studies, almost all of which were of low methodological quality (a major limitation of the review). We found that telephone follow-up has been applied in many patient groups. There is great variety in the ways the telephone follow-up has been performed. Many different outcomes have been measured. Some studies found effects in favour of the telephone follow-up intervention, but overall studies identified no statistically significant differences between the telephone follow-up and control groups. For as far as the results of studies could be pooled together, we could draw no firm conclusions about the effects of telephone follow-up. No studies identified adverse effects of the intervention.

6.1. Background

We know from several primary studies and literature reviews (Bull 2000; Cole 2001; Hyde 2000; Mistiaen 1999a; Parker 2002; Shepperd 2004) that many patients encounter a variety of problems in the first weeks after they have been discharged from hospital to home. These problems can include: difficulty with activities of daily living, emotional problems, knowledge deficit (for example, insufficient knowledge to understand symptoms or advice), insufficient help, uncertainty and anxiety, and informational needs (patient perceives a need for more information than given). For instance, Bull (Bull 2000) states that “people were given little information regarding their medications and condition, they had difficulty managing special diets, and they were often unclear about which activities they could engage in, or which ones they should avoid... In addition elders in one study had difficulty in evaluating symptoms and deciding whether a symptom was related to their medical condition or to the adverse effects of medication... Unmet information needs one week following hospital discharge were reported by 80% of elders... Problems with recognising the signs of complications, managing medication, diet and other aspects of treatment contributed to hospital readmission” (p. 71). Although postdischarge problems are not always major medical problems, patients often perceive them as giving discomfort (LeClerc 2002). There is also empirical evidence that health professionals rate postdischarge problems in a different way than patients (Reiley 1996).

Although generally-accepted definitions of postdischarge problems and the postdischarge period are lacking, and may vary across illnesses and treatment procedures, research has shown that postdischarge problems are most intense in the period immediately after hospital discharge. Naylor’s review (Naylor 2002) states that “4 to 6 weeks post discharge represents a critical period when many elders are at highest risk for poor discharge outcomes” and empirical research in a mixed population has shown that postdischarge problems are greater at 7 days post discharge than at 30 days post discharge (Mistiaen 1999b).

Moreover, in western developed countries, there is a tendency for shorter hospital stays and a shift to one-day-stay procedures, restricting the time available for health professionals to prepare patients adequately for their transfer to home and for the postdischarge period. This may increase postdischarge problems. Many projects have addressed discharge planning, with the aim of reducing problems after discharge. The focus of most discharge planning projects is selecting patients at risk of postdischarge problems as soon as possible after admission, preparing them in a timely and adequate fashion for discharge, and organising discharge arrangements. These discharge planning efforts do not resolve all problems, however (Parker 2002; Shepperd 2004). Patients need not only discharge preparation but also adequate aftercare. Aftercare is given in many different forms and may consist of several components, yet there is no scientific evidence that these aftercare efforts have clear beneficial effects (Bours 1998).

Since a large proportion of postdischarge problems relate to informational needs, and patients are reluctant to bother healthcare providers with their questions, it can be assumed that active telephone follow-up, initiated by hospital-based health professionals, may be of relevance to the problems patients face after discharge. Telephone follow-up (TFU) is seen as a good means of exchanging information, providing health education and advice, managing symptoms, recognising complications early, giving reassurance and providing quality aftercare service. Cox et al (Cox 2003) state that by telephone follow-up “information can be reinforced, thereby increasing compliance, and ensuring the physical and emotional comfort of the patient”. Moreover, TFU is an intervention that is easy to organise and, in itself, does not cost a lot of money or time. The technology is available to almost all patients in western developed countries. Some research (Bowman 1994; Cave 1989; Keeling 1995; Kelly 1999) has shown that TFU is feasible, and that patients are satisfied with the calls (Johnson 2000d; Moran 1999; Schaeffer 2001). However, at present it is not clear whether TFU is also effective in reducing postdischarge problems. Studies so far show mixed results. For example, a randomised controlled trial of telephone follow-up versus usual care in ophthalmic surgery patients (Boter 2000) found no beneficial effects, except that patients valued the phone call. The authors of this study suggest that the no-effect might be due to outcome instruments that were not sensitive enough, or due to the non-problematic character of the patient group. But no-effect has also been demonstrated for more complex patient groups such as oncology patients (Beney 2002). On the other hand Beckie (Beckie 1989a) found TFU (versus no TFU) to enhance knowledge with regard to self-care measures and to reduce anxiety after discharge in coronary artery bypass graft patients, although this could not be confirmed in a later study by Roebuck (Roebuck 1999). Finally, Hartford and Wong (Hartford 2000) conclude their narrative literature review that “plagued by inadequate sample size and weak designs, only two RCTs of nurse-initiated telephone follow-up in coronary artery bypass graft patients had positive results”. (p.32).

Therefore, this review aimed to determine the effects of TFU delivered in the first month after discharge, initiated by hospital-based health professionals, to patients discharged from hospital to home, with regard to psychosocial and physical outcomes in the first three months post discharge.

TFU is only one way of providing support after discharge; this review however focused solely on this form of care since Bours (Bours 1998) performed a systematic (non-Cochrane) review of multicomponent aftercare and Johnson (Johnson 2003) has prepared a Cochrane review of written and verbal information versus verbal information only for patients being discharged from acute hospital settings to home. Based on two trials, Johnson concludes that provision of verbal and written health information on discharge from hospital significantly increased knowledge and satisfaction scores. Bours states that the majority of the (seventeen) studies did not report clear beneficial effects in favour of the intervention (multicomponent aftercare) group.

Objectives

To determine the effects of follow-up telephone calls (TFU) in the first month post discharge, initiated by hospital-based health professionals, to patients discharged from hospital to home, with regard to psychosocial and physical outcomes in the first three months post discharge. The effects of TFU are compared to usual care or other types of hospital follow-up (for example TFU initiated by primary-care-based health professionals).

To determine the effects of TFU initiated/delivered by various health care professionals (eg. nurse, MD, social worker, pharmacist, ...) in subgroup analyses where appropriate.

To determine the effects of TFU initiated/delivered in various medical broad groups of patient populations (eg. all cardiac, all surgery patients, ...) in subgroup analyses where appropriate.

Although we expected to find that most TFU interventions focus on outcomes such as reassurance and informational needs, we included also other types of outcomes because of the great variety of postdischarge problems. We omitted to include patient satisfaction in the list of psychosocial outcomes in the protocol for this review (even though this outcome was discussed in the protocol background). We have therefore included satisfaction as a post hoc outcome in the review.

The following questions were addressed:

Primary outcomes:

- What are the effects of TFU initiated by a hospital-based health professional, on the psychosocial health (including uncertainty, anxiety, informational needs, mood, perceptions of coping, quality of life, social activity, satisfaction) of patients in the first three months post discharge, compared to usual care or other types of hospital follow-up?
- What are the effects of TFU on the physical health (including activities of daily living, self-care abilities, self efficacy, independence) of patients in the first three months post discharge compared to usual care or other types of hospital follow-up?

Secondary outcomes:

- What are the effects of TFU on adherence of patients to recommended care in the first three months post discharge compared to usual care or other types of hospital follow-up?
- What are the effects of TFU on patient knowledge regarding disease or symptom management in the first three months post discharge compared to usual care or other types of hospital follow-up?
- What are the effects of TFU on adverse events (new morbidity, readmission) in the first three months post discharge compared to usual care or other types of hospital follow-up?
- What are the effects of TFU on service utilisation (health care services) in the first three months post discharge compared to usual care or other types of hospital follow-up?

Factors influencing outcomes:

Intervention-related factors:

- Does the structure/format of the TFU influence the outcomes?
- Does the type of health care provider (eg. doctor, nurse, social worker) of the TFU influence the outcomes?
- Does the timing of the TFU influence the outcomes?
- Does the frequency of the TFU influence the outcomes?
- Do discharge planning activities and/or aftercare interventions other than the TFU influence the outcomes?

Patient-related factors:

- Does the age of patients influence the effects of TFU?
- Does the length of hospital stay influence the effects of TFU?
- Does the medical diagnosis or procedure, carried out prior to discharge, influence the effects of TFU?
- Do disease severity and co-morbidities influence the effects of TFU?
- Does the person's home living arrangements (living alone, living with someone) influence the effects of TFU?
- Does the gender of patients influence the effects of TFU?

Other related factors:

- Does the country influence the effects of TFU?
- Does the type of hospital influence the effects of TFU?

Note: throughout this review the term 'patient' is used. Although we recognise that terms such as 'consumer', 'client', or 'person with ... condition' may be more accurate than 'patient' and preferred by consumers themselves, we think that 'patient' remains the term that is most well known internationally to denote a person that is or has been in contact with a health professional for a certain condition.

6.2. Methods

Criteria for considering studies for this review

Types of studies

- randomised controlled trials
- controlled trials

In accordance with the definitions of the Cochrane EPOC group a study was considered to be a randomised controlled trial (RCT) if ‘the participants were definitely assigned prospectively to one or two (or more) alternative forms of health care using a process of random allocation (eg. random number generation, coin flips)’ and a study was considered to be a controlled trial if participants were ‘definitely assigned prospectively to one or two (or more) alternative forms of health care using a quasi-random allocation method (eg. alternation, date of birth, patient identifier) or possibly assigned prospectively to one or two (or more) alternative forms of health care using a process of random or quasi-random allocation’.

Types of participants

- all patients discharged from an acute hospital setting (including emergency departments and one-day-stay procedures) to home (including a relative’s home but excluding nursing homes or convalescence homes).
- all ages.

Types of interventions

Experimental intervention

Telephone follow-up (TFU) initiated by a hospital-based health professional (medical, nursing, social work, pharmaceutical, ...) to a patient who is discharged to his/her own home setting (including a relative’s home). The TFU has to be performed at least once within the first month after discharge. The TFU may have any kind of structure: for instance completely open (‘how are you doing?’) or completely structured. The TFU may contain one or more elements such as gathering of information, giving reassurance, giving advice on several topics, counseling, referral where required, etc.

The TFU has, in principle, to be targeted to the patients themselves. In cases where the patients themselves are not able to talk on the phone (eg. very young children, very sick people, patients with severe Alzheimer’s disease) on one or more occasions when the TFU is delivered, these studies are included. On the data-extraction sheet the extent was noted to which the TFU was indirect, and separate analyses were conducted if appropriate for studies in which the intervention for the entire research population was delivered directly to the patients, and for studies in which the TFU was (partly) delivered to relatives/caregivers. We excluded studies in which the TFU is intended primarily to address the problems of caregivers rather than of patients.

The TFU may be delivered as the only aftercare intervention, or may be part of a multi-component discharge planning or aftercare intervention, but only if the studies report data on the effects of the TFU component, or its effects can be isolated and analysed to some degree.

Control intervention
Usual care, or other types of hospital follow-up.

Types of outcome measures

In the protocol for this review we established that we would seek for and report data on the outcomes listed below. It is possible that other researchers may categorise these outcomes differently. However, the complexity and the heterogeneity of this field means that we have had to choose one approach to apply to this review.

Primary outcomes
Psychosocial health of patients, including:

- uncertainty;
- anxiety (and including depression where measured with the same instrument);
- informational needs;
- mood;
- coping;
- quality of life;
- social activity;
- satisfaction (post hoc outcome, see Objectives).

Physical health of patients, including:

- level of activities of daily living (ADL)/functional status;
- self-care abilities (an outcome generally used to mean self-care activities);
- self-efficacy (an outcome measured using Bandura's (Bandura 1977) concept of self-efficacy, and referring to beliefs in one's capabilities to organise and execute the courses of action required to produce given attainments)
- independence.

Secondary outcomes

Other consumer oriented outcomes, including:

- treatment adherence;
- knowledge of disease and symptom management;
- adverse effects (eg. complications, infection, readmission (ie, data reported from the patient's perspective)).

Health service delivery oriented outcomes, including:

- hospital readmission (ie. data reported from the perspective of the health service);
- health services utilisation.

The outcomes had to be measured at least once within the first three months post discharge. Since there is no generally-accepted definition of what a post-discharge period means, and the duration of postdischarge problems may vary for different illnesses and treatment procedures, the choice of a time period for study had to be arbitrary. However there is evidence, as stated earlier, that most postdischarge problems occur in the period immediately after discharge. Moreover three months is a period for which it is reasonable to assume that outcomes can be related to the intervention in the first month after discharge; it is not likely that if effects were not found in this immediate postdischarge time frame, effects would be found later.

No restrictions were made with regard to the measurement tools used, but psychometric properties were recorded.

This review is limited to outcomes in patients themselves; possible outcomes in carers or relatives are not included.

Search methods for identification of studies

See: Cochrane Consumers and Communication Group methods used in this reviews.
In August 2003 we searched the following databases, all from their original start date until July 2003:

- Cochrane Consumers and Communication Review Group’s Specialised Register,
- Cochrane Central Register of Controlled Trials (CENTRAL, The Cochrane Library),
- PubMed
- EMBASE (OVID)
- BiomedCentral
- CINAHL
- ERIC (OVID)
- INVERT (Dutch nursing literature index)
- LILACS
- Picarta (Dutch library system)
- PsycINFO/PsychLIT (OVID)
- Combined Social and Science Citation Index Expanded (SCIE), and
- SOCIOFILE.

We had planned to search the Cochrane EPOC Review Group’s Specialised Register and the System for Information on Grey Literature in Europe (SIGLE), but SIGLE was no longer available in any European library and we were unable to access the EPOC Specialised Register.
We used the highly-sensitive strategy for the retrieval of controlled trials in PubMed, as proposed by Robinson and Dickersin (Robinson 2002) and supported by the Dutch Cochrane Center:
(randomised controlled trial [pt] OR controlled clinical trial [pt] OR randomised controlled trials [mh] OR random allocation [mh] OR double-blind method [mh] OR single-blind method [mh] OR clinical trial [pt] OR clinical trials [mh] OR (“clinical trial” [tw]) OR ((singl* [tw] OR doubl* [tw] OR trebl* [tw] OR tripl* [tw]) AND (mask* [tw] OR blind* [tw])) OR (“latin square” [tw]) OR placebos [mh] OR placebo* [tw] OR random* [tw] OR research design [mh:noexp]) OR comparative study [mh] OR evaluation studies [mh] OR follow-up studies [mh] OR prospective studies [mh] OR cross-over studies [mh] OR control* [tw] OR prospectiv* [tw] OR volunteer* [tw]) NOT (animal [mh] NOT human [mh])

For PubMed, the above strategy was combined by AND with the following strategy:
"telecommunications"[MeSH Terms] OR tele?communication* [tw] OR electronic communication* OR "telephone"[MeSH Terms] OR telephon* [tw] OR phone[tw] OR phone call* OR follow-up call* OR call?back [tw] OR calls [tw] OR calling [tw] OR call [tw] OR tele?health OR tele?medicine
AND
"patient discharge"[MeSH Terms] OR ((patient* OR client* OR consumer* OR recipient* OR subject*) AND discharg*) OR hospital discharg* OR "hospital discharge"[tw] OR "aftercare"[MeSH Terms] OR aftercare [tw] OR "continuity of patient care"[MeSH Terms] OR convales*[tw] OR recover*[tw] OR post?operative care OR ((patient* OR client* OR consumer* OR recipient* OR subject* OR care?giver* OR carer* OR famil*) AND (inform* OR educat* OR instruct* OR counsel* OR advise* OR advice OR reassur* OR support*)) OR information* need* [tw] OR post?hospital*

We made appropriate variations of the PubMed strategy for the other databases; the strategies are listed in the Additional Tables (Table 01; Table 02). These can be found in electronic format at:
http://www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD004510/.

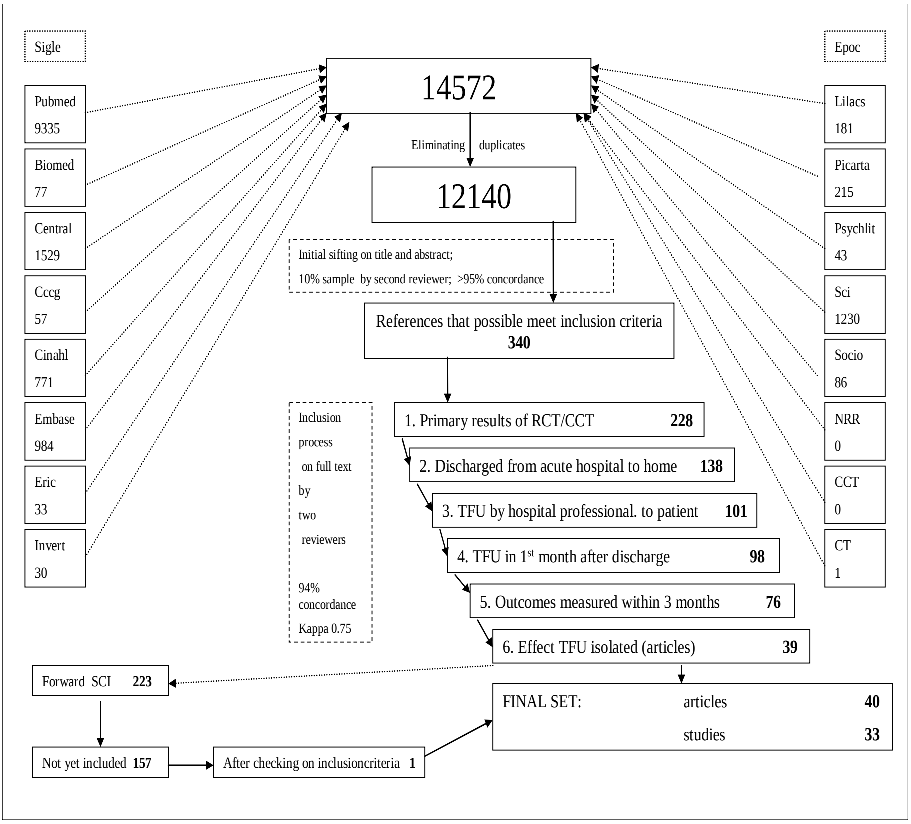
We located additional references by searching the reference lists of included studies and by contacting individuals known to be active in the field of discharge and/or telephone care. In September 2004 we performed a forward search based on the included papers in the Science Citation Index, to find more recent papers that cited one or more of the already included studies.

We sought to identify ongoing research by searching the following databases in August 2003:

- National Research Register (http://www.update-software.com/nrr/);
- Controlled Clinical Trials (http://www.controlled-trials.com/);
- Clinical Trials (http://clinicaltrials.gov/).

We did not limit the search with regard to language or publication date. The search process is presented graphically in Figure 6.1.

Figure 6.1 Inclusion process



Methods of the review

Electronic searching in the 16 databases yielded a total of 14,572 citations and, after elimination of duplicates, 12,140 citations were left for initial sifting. This very large number of references is due to the fact that the telephone is used in many studies to collect data. It was impossible to make a distinction in the search strategies between telephone as data collection method and telephone as an intervention.

Throughout the review process, the review authors were not blind to authorship of trials.

Stage 1: initial sifting

Two authors (PM, EP) independently checked a 10% random sample of these references, and as agreement between authors was more than 95%, further sifting at this stage was conducted by PM only. If the agreement whether to exclude studies between the two authors on the 10% sample was lower than 95%, it was planned the second author would proceed to check the other 90% of the sample. Where there was insufficient information from the title and/or abstract to determine relevance, we ordered the article in full text and proceeded to the second stage. This initial sifting against the inclusion criteria based on the title and abstract resulted in 340 potentially-relevant references.

Stage 2: inclusion procedure

We retrieved these 340 citations in full text, and assessed them against the six inclusion criteria as follows:

- (randomised) controlled trial;
- research participants are patients discharged from hospital to their own home;
- intervention must be at least one TFU call initiated by a hospital-based health professional and, in principle, directed to the patients themselves;
- intervention has to take place at least once within the first month after hospital discharge;
- outcomes have to be measured at least once within the first three months after hospital discharge; and
- if the TFU is part of multi-component intervention, the study reports data on the effects of the TFU-component, or its effects can be isolated and analysed to some degree.

For each study the criteria were judged from top to bottom; from the moment a criterion was not met no further assessment was made relating to the subsequent criteria.

At this second stage, all studies were checked by two review authors independently. Inter-rater agreement in this process was 94% with a kappa-coefficient of 0.75. We resolved disagreement on inclusion or exclusion was resolved by discussion. If no agreement could be reached, it was planned a third author would decide.

The process of searching and assessing studies against the review's inclusion criteria resulted in a set of 39 articles, describing 32 studies. We conducted a forward search with these 39 references in the combined Social and Science Citation Index (search date: 4 September 2004). The 39 references were cited 293 times in 223 different articles, of which 66 were already in the data-set of 2003. The remaining 157 references were checked against the inclusion criteria. Only one study (Tranmer 2004) met the criteria and was added to the final set of included studies, bringing the total to 33 included studies discussed in 40 papers. We present the inclusion process schematically at Figure 6.1.

The main reasons for the exclusion of studies were as follows: the study did not present results from a (randomised) controlled trial (37%); the study did not concern patients discharged from hospital (30%); the intervention under investigation was not TFU (12%); or the study did not meet the other inclusion criteria. We provide additional details in the table Characteristics of Excluded Studies. This table, as well as the references to the excluded studies, can be found in electronic format at:
http://www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD004510/.

Stage 3: data extraction

We developed a data extraction sheet (based on the Cochrane Consumers and Communication Review Group's data extraction template), pilot-tested it on ten randomly-selected included studies, and refined it accordingly. One review author (PM) extracted the following data from included studies and the second author (EP) checked the extracted data:

- study population (diagnosis, co-morbidities, hospital procedures, age, gender-ratio, length of stay, family support, inclusion and exclusion criteria);
- study environment (type of hospital, country);
- study methods (design, randomisation procedure);
- intervention (provider, structure, content, time, frequency, duration, who answered the phone (patient or relative));
- co-interventions (discharge preparation, other forms of aftercare);
- control intervention (usual care description, TFU by others);
- outcomes (type of outcome, measurement tool (type, psychometrics), timing and frequency of assessment);
- results (mean and range at the different measurement moments post

discharge, for both experimental and control group);

- conclusions (as stated by the study authors);
- limitations of study and other remarks.

Disagreements were resolved by discussion between the two review authors; if no agreement could be reached, it was planned a third author would decide.

We contacted five authors (Boter 2000; Gortner 1990; Hartford 2002; Jerant 2001; Ouellet 2003) for further information. All responded and one (Hartford 2002) provided numerical data that had only been presented graphically in the published paper.

Stage 4: assessment of methodological quality

We assessed the methodological quality of included studies using the criteria from the Cochrane Effective Practice and Organisation of Care Review Group (Alderson 2002). This list contains seven criteria to evaluate randomised controlled trials (RCTs) and controlled clinical trials (CCTs): concealment of allocation, follow-up of professionals, follow-up of patients, blinded assessment of primary outcomes, baseline measurement, reliable primary outcome measures, and protection against contamination. Further, as outlined in the Cochrane Handbook (Clarke 2003), we grouped studies into three categories: A (low risk of bias = all criteria met), B (moderate risk of bias = at least four of the criteria met) and C (high risk of bias = less than four of the criteria met).

Two review authors conducted the quality assessment independently. Disagreements were resolved by discussion between the two review authors; if not agreement could be reached, it was planned a third review author would decide. In some cases an editor of the Cochrane Consumers and Communication Review Group had input to clarifying the quality assessment for particular studies.

The EPOC quality assessment rating of each study can be found in the table Characteristics of Included Studies, which can be found at http://www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD004510/. The quality of included studies was used to inform the discussion of the review's findings.

Stage 5: analysis

The primary analysis was a comparison of TFU with usual care or with other types of hospital follow-up, for each of the questions outlined in the review's objectives.

We grouped studies in different ways: according to similarity of intervention, according to broad groups of patient populations (eg. all cardiac patients, all surgery patients) and according to the outcomes measured. The broad groupings of patient populations were based on the similarity of issues that these patients face when they are discharged from hospital. All comparisons that were attempted or made are narratively described and presented in graphs where possible. Since we expected to find significant heterogeneity in intervention modalities, research populations, outcomes and measurement tools, we only combined the study results statistically where appropriate and with inspection of the tests for homogeneity.

The meta-analytic technique depended on the outcomes reported. For all primary and secondary outcomes (excepting adverse events, hospital readmission and health services utilisation), it was anticipated that the majority would be measured and reported as continuous data. For continuous data (which used the same instrument) the weighted mean difference (WMD) and 95% confidence intervals (CI) are reported. Where the studies have used different instruments to measure the same conceptual outcome, the standardised mean difference (SMD) is reported. In studies that report dichotomous data (eg. with regard to readmission), the relative risk (RR) and CIs are reported. We analysed all comparisons with both a fixed-effect and a random-effects model, but only the analyses with the random-effects model are presented. We paid particular attention to the possible heterogeneity in studies and the consequences of this for interpreting the results.

If appropriate, we had planned to conduct subgroup analyses:

- for gender;
- for age group (children/adults/old/old-old);
- for living status (alone/together);
- for the different health care professionals delivering the TFU;
- for types of hospital (university, general,..);
- for countries;

- for TFU after one-day-stay procedures versus TFU after more than one day hospital stays;
- for TFU after short hospital stays (<1 week) versus TFU after longer hospital stays;
- for TFU as the only form of discharge care versus TFU as part of multi-component discharge procedures;
- for TFU given in the first week after discharge versus TFU given later than the first week after discharge;
- for TFU in which only patients themselves were involved versus TFU in which relatives answered the telephone (due to the patient's inability);
- for TFU given as a once-only intervention versus repeated TFU; and
- for TFU given to different patient categories according to the medical diagnosis or health status (eg. severe, end of life, etc.).

We had also planned to conduct sensitivity analyses by repeating the analyses excluding studies with a 'C' methodological rating, by excluding unpublished studies, and by excluding studies with extreme outlying sample sizes. However, we could not perform the intended subgroup-analyses and sensitivity analyses as too few studies were available. Consequently, we can not report any meaningful results in relation to factors that may influence the outcomes.

We were not able to report on results separately for studies where the TFU was (partly) delivered to relatives/caregivers, such as in cases where the patient has severe Alzheimer's Disease, due to lack of data.

Consumer views and participation

The protocol was submitted to three participating consumers in the Cochrane Consumers and Communication Review Group for comment, in addition to the Review Group's usual external peer review process. We sought and received additional commentary from consumers in preparing the text of the final review, through the Dutch Patients and Consumers Federation (NPCF) and the Patients' Association (UK).

6.3. Results

Description of studies

Details of each study can be found in the table Characteristics of Included Studies (http://www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD004510/).

TFU is an intervention that is often applied and researched in discharged patients. For this review, we selected studies in which TFU was the only intervention, or in which the effect of the TFU could be differentiated from other interventions. TFU is often combined with other discharge planning interventions, as shown in several of the included studies (Al-Asseri 2001; Barnason 1995; Beckie 1989; Faulkner 2000; Garding 1988; Gortner 1990; Hagopian 1990; Jerant 2001; Mohan 1999; Munro 1994). The main reasons for excluding studies were: study design (not a (randomised) controlled trial), participants (not about patients discharged from an hospital to their own home or not about a telephone follow-up initiated by a hospital-based health professional), or the effects of TFU could not be calculated. For further details, see Figure 6.1 and the table Characteristics of Excluded Studies (http://www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD004510/).

Patient categories

TFU has been applied in various patient categories, as follows:

- surgery (16) (Al-Asseri 2001; Barnason 1995; Beckie 1989; Boter 2000; Emerson 2000; Fallis 2001; Faulkner 2000; Gombeski 1993; Gortner 1990; Hartford 2002; Ouellet 2003; Roebuck 1999; Samarel 2002; Touyz 1998; Tranmer 2004; Weaver 2001);
- cardiac (12) (Al-Asseri 2001; Barnason 1995; Beckie 1989; Faulkner 2000; Garding 1988; Gortner 1990; Hartford 2002; Jerant 2001; Riegel 2002; Roebuck 1999; Tranmer 2004; Weaver 2001);
- emergency department (5) (Chande 1994; Jones 1988; Nelson 1991; Ritchie 2000; Shesser 1986);
- oncology (4) (Beney 2002; Hagopian 1990; Munro 1994; Samarel 2002);
- paediatric (3) (Chande 1994; Mohan 1999; Nelson 1991);
- neurology (2) (Phillips 1999; Phillips 2001);
- ophthalmology (1) (Boter 2000);
- diabetes (1) (Tu 1993);
- general medicine (1) (Dudas 2001); and;
- mixed (1) (Bostrom 1996).

Some studies fall into more than one category, for example, cardiac surgery patients are included in the categories of cardiac patients and surgery patients; and studies including breast cancer patients who receive surgery and/or chemotherapy fall into both the oncology and surgery categories. The large variety in patient populations also means that there is considerable clinical heterogeneity in research samples, which made it difficult to pool results across studies. However, in some patient categories there are quite large numbers of studies, as shown above.

Further characteristics of the patient population such as age ranges, gender, race, socio-economic status and comorbidity can be found in the table Characteristics of Included Studies insofar as this information was provided in the trial reports (http://www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD004510/). There is also considerable variety between and within studies in these population characteristics. Studies were all conducted in high-income countries (Australia, Canada, The Netherlands, Saudi Arabia, UK, USA). It is important to note that all studies included only patients who were able to speak (and moreover, able to speak the same language as the people delivering and evaluating the TFU intervention) and handle a telephone, which makes the studies' conclusions less generalisable.

A total of 5110 patients is analysed in the 33 studies, varying in studies between 27 (Emerson 2000) and 842 (Jones 1988) with a mean of 154.8 patients per study (SD 162.4, median 118). Fifteen studies analysed less than 100 patients, twelve studies analysed between 101 and 200 patients, and six had more than 200 patients.

Intervention

There is a large variety in the way the TFU was performed in the included studies. There is variety both within and across studies in: the health professionals who undertook the TFU; the aims of the interventions; the time after discharge the calls were made; the frequency of TFU calls; the format and content of the TFU; the duration of the calls; and other aspects.

The TFU calls were made primarily by nurses (22 studies). Other professsionals involved were pharmacists (Al-Asseri 2001; Beney 2002; Dudas 2001; Faulkner 2000) and physicians (Chande 1994; Touyz 1998). In three studies (Munro 1994; Ritchie 2000; Samarel 2002) different professionals were involved in performing the TFU, and in two studies (Gombeski 1993; Mohan 1999) it was not clear which health professional delivered the intervention.

The aims of the TFU can roughly be grouped in two categories: 1) to improve compliance of patients with drug regimes or appointments; or 2) to ease the transition between hospital and home and to lessen experienced distress (such as anxiety, informational needs or symptom distress) of patients in the immediate postdischarge period, by enhancing their knowledge to better manage symptoms or by giving them support and reassurance. Generally, the study authors expect that achieving the aims will lead to improved patient satisfaction, better (experienced) quality of life, fewer complications and readmissions and less resource use. Almost all studies lacked a clear theoretical framework for relating the interventions to the aims and (sequence of) outcomes and endpoints.

The frequency and timing of the intervention delivery also varied. The frequency of calls made to patients within a three-month time period after discharge varied from a single call to a series of 32 calls (Samarel 2002). Single calls were used in 14 studies, between 2 and 5 calls were applied in 7 studies (Bostrom 1996; Garding 1988; Hagopian 1990; Munro 1994; Roebuck 1999; Tu 1993; Weaver 2001), 6 to 10 calls in 7 studies (Beckie 1989; Gortner 1990; Hartford 2002; Jerant 2001; Mohan 1999; Phillips 2001; Tranmer 2004) and more than 10 calls in 5 studies (Al-Asseri 2001; Faulkner 2000; Phillips 1999; Riegel 2002; Samarel 2002). In terms of frequency of calls there are differences both between and within studies. With regard to timing, the patient was first telephoned within the first week (varying between the first and the seventh day) after discharge in 28 studies. The latest time the first call to the patient was made was four weeks after discharge. There are not only differences in timing of intervention delivery between studies, but also within studies (for example patients were called in the first week, or between the first and third day after discharge, or between week 2 and 4 after discharge).

Some studies used a highly structured format for the TFU, with written protocols and questions that had to be asked (for example Boter 2000; Shesser 1986; Weaver 2001), while another (Fallis 2001) does not provide any details as to how the TFU was conducted. The other included studies lay somewhere between these extremes. All articles lacked a description of the intervention sufficiently detailed and clear as to allow replication of the intervention. The control intervention, moreover, was the subject of even less description, mostly listed unhelpfully as ‘usual care’.

Outcomes

Many different outcomes, falling into several categories, were measured in these studies. The number of outcomes varied between one and six per study, with a mean of 2.5 outcomes. In total, 82 outcomes were measured in the 33 included studies. (We present a more detailed list of studies categorised by outcomes in the Results section.)

Psychosocial health outcomes were measured in 20 studies. The most frequently measured outcome in this area was patient satisfaction (11), followed by anxiety (4) and depression (3). Other outcomes related to psychosocial health are: informational needs, uncertainty, mood state, coping, well-being, mental status, concerns, emotional functioning, mood disturbance, and (dimensions of) quality of life.

Physical health outcomes were measured in 10 studies. These included: activity level, functional limitations, independence, functional well-being, physical status, physical well-being, recovery, self care, self-care deficits, self efficacy, symptoms, pain, analgesic use, blood glucose level, lipid profiles, and tracking/diagnosing pressure ulcers. Although some of these outcomes are conceptually related, the authors gave them different names. Moreover, in general, self-developed instruments were used to measure these outcomes and no two instruments were sufficiently similar to enable comparison or pooling of the results across studies.

Other consumer-oriented health outcomes were measured in 14 studies. These concerned compliance (7), knowledge (4), social functioning & loneliness (1), symptom distress (1) and side-effects (2). (In the protocol for this review, we used the term ‘adherence’. However, since all publications use the word ‘compliance’, we chose to use this term in the reporting of results.)

Health-services-oriented outcomes were measured in 11 studies; these considered readmissions (10), Emergency Department (ED) visits (5),

unnecessary return office visits, calls to hospital and costs.
Outcomes not only varied across studies, but even when quite similar outcomes were measured in more than one study, in most cases different instruments were used.

Methodological quality

Twelve (Beckie 1989; Beney 2002; Boter 2000; Faulkner 2000; Gortner 1990; Hartford 2002; Jerant 2001; Jones 1988; Mohan 1999; Nelson 1991; Ritchie 2000; Tranmer 2004) of the 33 studies fulfilled the (strict) criteria of a randomised controlled design according to EPOC's guidelines (Alderson 2002). We describe the remaining 21 studies as controlled clinical trials (CCTs), primarily because we could not be certain, from the papers, whether there definitely was prospectively random allocation to intervention and control groups. Self-developed instruments were used for most outcomes; psychometric quality was doubtful for most instruments. Power calculation had been done in 15 of the 33 studies. Keeping in mind the low average sample sizes there is a great chance that studies were underpowered, and effects that in reality exist were not detected.

Two review authors independently assessed the methodological quality of included studies using the EPOC criteria (Alderson 2002). The mean quality score of the first author was 2.5 and for the second author was 2.6, which was not significantly different (P=0.72). The two authors initially agreed on the methodological quality categories for 22 of the 33 included studies; the remaining 11 studies were discussed until the authors reached agreement. This resulted in 7 studies categorised as having a 'moderate risk of bias' (Beney 2002; Garding 1988; Hartford 2002; Jerant 2001; Nelson 1991; Ritchie 2000; Tranmer 2004), and the remaining 26 studies categorised as having a 'high risk of bias'. The EPOC quality criteria most often not met were: 'reliable primary outcome measures' (29/33), concealment of allocation (25/33), blinded assessment of primary outcomes' (22/33), 'baseline measurement' (15/33), protection against contamination (15/33), and follow-up of patients (9/33).

In summary, most of the studies included in this review have a high risk of bias, based on the published reports.

Results

In 12 studies (Barnason 1995; Beney 2002; Bostrom 1996; Boter 2000; Hagopian 1990; Mohan 1999; Munro 1994; Ouellet 2003; Phillips 1999; Roebuck 1999; Tranmer 2004; Weaver 2001) *the study authors* conclude they found no statistically significant differences between TFU and control groups. No author *reported* negative effects of the TFU intervention. The *authors* of 21 studies conclude in favour of the TFU. It must be noted that in two studies (Emerson 2000; Gombeski 1993) the conclusions are only supported with tendencies to significance (P-values that are close to 0.05). Moreover, these conclusions are sometimes only supported by significant differences later than three months after discharge, that is, outside the inclusion criteria for the review (Faulkner 2000; Jerant 2001; Phillips 2001). Of the 82 outcomes measured across the 33 studies, *study authors* report significant differences in favour of the TFU for 25 outcomes within the 3-month time period.

Overall findings reported by quality of studies

Categorised by methodological quality: in the 7 studies with moderate risk of bias, 18 outcomes were measured within 3 months post discharge. Of these, four studies revealed significant results (all in favour of the TFU-group) namely for knowledge (Garding 1988), for anxiety (Hartford 2002), and for compliance (Nelson 1991; Ritchie 2000). In the 26 studies with high risk of bias, 65 outcomes were measured of which 21 outcomes showed significant differences all in the favour direction for the TFU group, namely for satisfaction (Dudas 2001; Fallis 2001; Shesser 1986), for compliance (Al-Asseri 2001; Chande 1994; Jones 1988), for readmissions (Beckie 1989; Riegel 2002), for anxiety (Beckie 1989), for patient concerns (Fallis 2001), for mood disturbance (Samarel 2002), for activity level (Gortner 1990), for pain (Touyz 1998), for analgesic use (Touyz 1998), for selfcare deficits (Tu 1993), for self-efficacy (Gortner 1990), for knowledge (Beckie 1989), for calls to the hospital (Beckie 1989), for Emergency Department (ED)-visits (Dudas 2001), for drugs-related side-effects (Al-Asseri 2001) and for costs (Riegel 2002)).

Although satisfaction was not explicitly stated in our review protocol as an outcome, we did not want to exclude it because it was the most frequently measured outcome (11 studies); as noted in the Objectives, satisfaction has been added into the category of psychosocial health outcomes.

It was not possible to present results grouped by similar TFU interventions, as we had planned, because of the heterogeneity in the interventions, and also lack of detailed information about the interventions. We have presented results grouped by outcomes measured, and by similar patient populations, as we had planned.

Results by outcome category

Psychosocial outcomes

Twenty studies measured some kind of pyschosocial health outcome (Al-Asseri 2001; Barnason 1995; Beckie 1989; Beney 2002; Bostrom 1996; Boter 2000; Dudas 2001; Fallis 2001; Gombeski 1993; Gortner 1990; Hagopian 1990; Hartford 2002; Jerant 2001; Munro 1994; Phillips 2001; Roebuck 1999; Samarel 2002; Shesser 1986; Tranmer 2004; Weaver 2001). Five of these studies (Beckie 1989; Dudas 2001; Fallis 2001; Hartford 2002; Shesser 1986) found favourable results in this outcome category for the TFU intervention group, namely for anxiety, satisfaction or concerns. With respect to satisfaction, however, in contrast to the three studies showing favourable effects (Dudas 2001; Fallis 2001; Shesser 1986), eight studies find no differences between intervention and control groups. Similarly, with respect to anxiety there are two studies (Beckie 1989; Hartford 2002) showing the intervention has positive effects and two studies (Hagopian 1990; Roebuck 1999) showing no difference.

Physical outcomes

Physical health outcomes were measured in ten studies (Beney 2002; Boter 2000; Gortner 1990; Hagopian 1990; Jerant 2001; Ouellet 2003; Phillips 1999; Touyz 1998; Tranmer 2004; Tu 1993). Seven of these found no differences between the intervention and control groups. However Gortner 1990 found effects in favour of the TFU group for activity level and self-efficacy; Touyz 1998 for pain and analgesic use; and Tu 1993 for self care deficits.

Other consumer-related outcomes

Other consumer-related outcomes were measured in 14 studies (Al-Asseri 2001; Barnason 1995; Beckie 1989; Beney 2002; Chande 1994; Faulkner 2000; Garding 1988; Hagopian 1990; Jones 1988; Mohan 1999; Nelson

1991; Ritchie 2000; Samarel 2002; Tu 1993). Compliance was found to be enhanced for the TFU group in five studies (Al-Asseri 2001; Chande 1994; Jones 1988; Nelson 1991; Ritchie 2000). With the exception of Al-Asseri 2001 these concern ED patients who received a single call very shortly after their ED attendance, in which they were reminded of instructions and to make an appointment with their referral doctor.Two studies (Faulkner 2000; Mohan 1999) found no differences in this compliance between groups. Knowledge was better for the TFU group in two studies (Beckie 1989; Garding 1988) and no differences in knowledge between the groups were found in two other studies (Barnason 1995; Tu 1993). Samarel 2002 assessed social functioning and loneliness, and found clinically equivalent results for the intervention and control group. Beney 2002 studied symptom distress and found no significant differences. Severity of side-effects of the radiotherapy, as studied by Hagopian 1990, was similar for both groups. Al-Asseri 2001 assessed the number of patients reporting drug-related side effects and found a significantly smaller number of patients reporting such side effects in the TFU group.

Health services related outcomes

Health services related outcomes were measured in 11 studies (Beckie 1989; Bostrom 1996; Dudas 2001; Emerson 2000; Fallis 2001; Ouellet 2003; Phillips 1999; Phillips 2001; Riegel 2002; Tranmer 2004; Weaver 2001). Two studies identified fewer readmissions in the intervention group (Beckie 1989; Riegel 2002) while eight studies found no differences. One study found fewer emergency department visits for the TFU group (Dudas 2001), however four studies (Fallis 2001; Ouellet 2003; Tranmer 2004; Weaver 2001) did not identify differences in this respect.

It should be noted that although we examined the studies for adverse effects of the TFU intervention, no author reported them. However, it is unclear whether study authors sought to identify adverse effects and included these outcomes in their research protocols.

Results of data pooling

We selected outcomes and patient categories for which data could be pooled quantitatively. Such pooling was only considered if similar outcomes (for example, anxiety, as a subcategory of psychosocial outcomes) were measured in at least two studies in a similar patient group (for example patients with a cardiac condition or patients who had undergone surgery).

Table 6.3 shows the outcomes and patient categories for which this criterion was met. (Note: cells in this table are not necessarily mutually exclusive, for instance studies of patients who had undergone cardiac surgery appear in the table under the categories of cardiac patients and of surgery patients). As outlined in the Cochrane Handbook (Clarke 2003), meta-analysis should only be considered when a group of trials is sufficiently homogeneous in terms of participants, interventions and outcomes to provide a meaningful summary. In each outcome and patient category the measurement time had to be similar, and the scales used had to be either similarly continuous or similarly dichotomous. Above all, in each category we determined whether there was sufficient clinical homogeneity to warrant data pooling. We discuss these comparisons below for each combination from Table 6.3.

Table 6.3 Outcome/patient combinations for which pooling was considered

Outcome category	**Cardiac patients**	**Surgery patients**	**ED patients**	**Paediatric patients**	**Neurology patients**
PSYCHO-SOCIAL HEALTH OUTCOMES					
-anxiety	3	3			
-satisfaction	5	6			
-depression	2	2			
OTHER CONSUMER ORIENTED OUTCOMES					
-compliance	2	2	4	3	
-knowledge	3	2			
HEALTH SERVICES ORIENTED OUTCOMES					
-readmissions	4	5			2
-ED-visits	2	3			

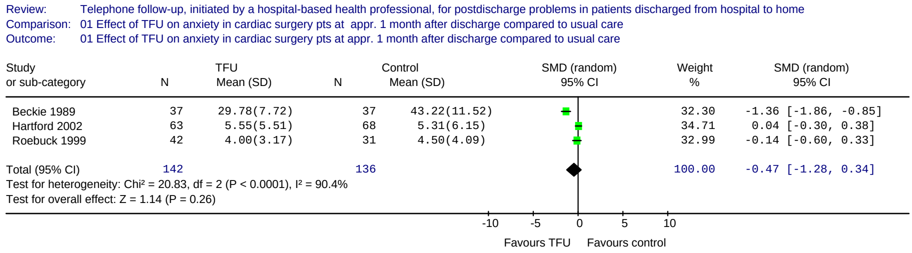
As far as pooling was attempted, for continuous outcomes we used standardised means differences (SMDs) and a random-effects mode; for dichotomous data, we used relative risks and a random-effects model. Confidence intervals were set at 95%. In all comparisons, tests were performed with regard to statistical homogeneity; this was judged (following the Cochrane Handbook (Clarke 2003)), to be acceptable as the chi-square test value was lower than the degrees of freedom, the P value of it was above 0.1 and the inconsistency test I^2 was lower than 50%. Finally, due to the earlier described heterogeneity in patient populations, research tools, and intervention modes, and due to the predominately low methodological quality of the studies, we stress that all reported meta-analyses have to be considered with caution.

Comparisons related to psychosocial health outcomes

A) Effect of TFU on anxiety in cardiac surgery patients at approximately one month after discharge compared to usual care

Three studies measured anxiety in cardiac patients (Beckie 1989; Hartford 2002; Roebuck 1999). Two studies (Beckie 1989; Roebuck 1999) were rated as having a high risk of bias and one (Hartford 2002) as having a moderate risk of bias. All three studies involved people undergoing cardiac surgery. Anxiety was measured at a reasonably similar point in time (four and eight weeks (Hartford 2002) (data from the measurement at four weeks was used for the meta-analysis), five weeks (Roebuck 1999), and six weeks (Beckie 1989)). Three different measurement tools were used, but all measuring continuous outcomes. Pooling showed a standardised mean difference of -0.47 (95% CI -1.28 to 0.34), which means both approaches are clinically equivalent (see Comparison 01, Outcome 01). However, caution is needed since tests demonstrated large statistical heterogeneity.

Analysis 01.01. Comparison 01 Effect of TFU on anxiety in cardiac surgery patients at appr. 1 month after discharge compared to usual care
Outcome 01 Effect of TFU on anxiety in cardiac surgery patients at appr. 1 month after discharge compared to usual care



Review: Telephone follow-up, initiated by a hospital-based health professional, for postdischarge problems in patients discharged from hospital to home
Comparison: 01 Effect of TFU on anxiety in cardiac surgery pts at appr. 1 month after discharge compared to usual care
Outcome: 01 Effect of TFU on anxiety in cardiac surgery pts at appr. 1 month after discharge compared to usual care

Study or sub-category	N	TFU Mean (SD)	N	Control Mean (SD)	Weight %	SMD (random) 95% CI
Beckie 1989	37	29.78(7.72)	37	43.22(11.52)	32.30	-1.36 [-1.86, -0.85]
Hartford 2002	63	5.55(5.51)	68	5.31(6.15)	34.71	0.04 [-0.30, 0.38]
Roebuck 1999	42	4.00(3.17)	31	4.50(4.09)	32.99	-0.14 [-0.60, 0.33]
Total (95% CI)	142		136		100.00	-0.47 [-1.28, 0.34]

Test for heterogeneity: Chi² = 20.83, df = 2 (P < 0.0001), I² = 90.4%
Test for overall effect: Z = 1.14 (P = 0.26)

B) *Effect of TFU on satisfaction in cardiac (medical and surgical) patients compared to control condition*

This comparison potentially involved five studies (Al-Asseri 2001; Barnason 1995; Jerant 2001; Tranmer 2004; Weaver 2001). All applied different instruments. Barnason 1995, Tranmer 2004 and Weaver 2001 measured satisfaction at approximately one month, using some kind of continuous measurement. Weaver 2001 did not present raw data and said only that there were no statistical differences. Barnason 1995 and Tranmer 2004 used different control groups, but both found no differences. Al-Asseri 2001 and Jerant 2001 measured the outcome at two months post discharge. Al-Asseri 2001 used a dichotomous outcome measure and Jerant 2001 a continuous one, which makes pooling difficult; neither found statistical differences. Heterogeneity between the studies in terms of instruments used, control groups and timing of measurement, meant that pooling could not be performed.

C) *Effect of TFU on satisfaction in surgery patients*

Six studies measured satisfaction in surgery patients: Al-Asseri 2001 (cardiac surgery), Barnason 1995 (cardiac surgery), Fallis 2001 (laparoscopic cholecystectomy), Gombeski 1993 (general surgery and otolaryngoly), Tranmer 2004 (cardiac surgery) and Weaver 2001 (cardiac surgery). Fallis 2001 measured satisfaction at two days post discharge, Barnason 1995, Tranmer 2004 and Weaver 2001 measured this outcome at approximately one month, Gombeski 1993 at six weeks and Al-Asseri 2001 at two months. Therefore statistical pooling was not possible due to heterogeneity in measurement times. Five studies found no differences in satisfaction and only Fallis 2001 concludes that the TFU group is statistically more satisfied. This study used a chi-square test for a continuous outcome, however, and the author states that the results should be viewed with caution because of small cell sizes.

In conclusion, with regard to satisfaction in surgery patients, statistical pooling was not possible, and no single study identified favourable effects for the TFU group compared with the control groups.

D) *Effect of TFU on depression in cardiac surgery patients*

The next potential comparison concerns depression in cardiac surgery patients. Two studies measured this outcomes in cardiac surgery patients (Roebuck 1999; Weaver 2001). In one study the outcome was measured at one month and in the other at five weeks post discharge. These studies used two different instruments, both with a continuous scale. However, Weaver 2001 only presents a dichotomised result, which makes pooling impossible. Both studies found no statistically significant differences between intervention and control groups with regard to depression in cardiac surgery patients.

Comparisons related to physical health outcomes

No statistical pooling was possible in this category, as too few studies measured comparable outcomes.

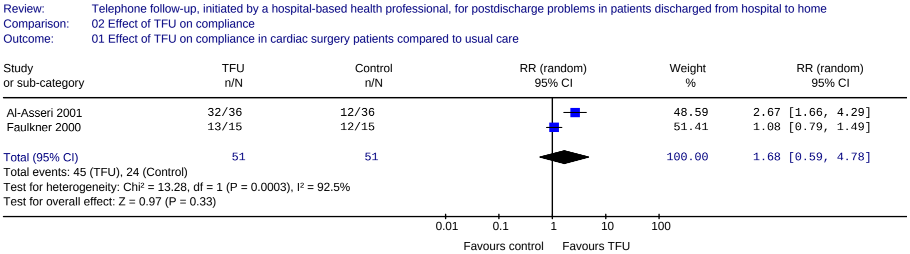
Comparisons related to other consumer-oriented health outcomes

In this category, we examined compliance in several patient groups, as well as knowledge in cardiac patients.

E) Effect of TFU on compliance in cardiac surgery patients compared to usual care

Al-Asseri 2001 and Faulkner 2000 studied compliance with pill-taking in cardiac surgery patients. Al-Asseri 2001 and Faulkner 2000 were both rated as having a high risk of bias. Al-Asseri 2001 measured this outcome at 8 weeks, and Faulkner 2000 at 6 and 12 weeks after discharge. Both used dichotomous scales. For the meta-analysis, data of 6 and 8 weeks are combined; the combined effect is statistically not significant (RR 1.68, 95% CI 0.59 to 4.78) (see Comparison 02, Outcome 01). However, caution has to be taken in the interpretation of this pooling because tests demonstrated large statistical heterogeneity.

Analysis 02.01. Comparison 02 Effect of TFU on compliance
Outcome 01 Effect of TFU on compliance in cardiac surgery patients compared to usual care



Review: Telephone follow-up, initiated by a hospital-based health professional, for postdischarge problems in patients discharged from hospital to home
Comparison: 02 Effect of TFU on compliance
Outcome: 01 Effect of TFU on compliance in cardiac surgery patients compared to usual care

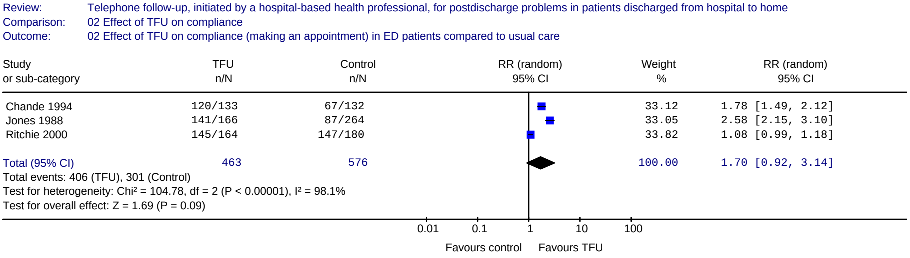
Study or sub-category	TFU n/N	Control n/N	RR (random) 95% CI	Weight %	RR (random) 95% CI
Al-Asseri 2001	32/36	12/36		48.59	2.67 [1.66, 4.29]
Faulkner 2000	13/15	12/15		51.41	1.08 [0.79, 1.49]
Total (95% CI)	51	51		100.00	1.68 [0.59, 4.78]

Total events: 45 (TFU), 24 (Control)
Test for heterogeneity: Chi² = 13.28, df = 1 (P = 0.0003), I² = 92.5%
Test for overall effect: Z = 0.97 (P = 0.33)

F) *Effect of TFU on compliance (making and keeping an appointment) in ED patients compared to usual care*

Four studies measured compliance in ED patients (Chande 1994; Jones 1988; Nelson 1991; Ritchie 2000). Nelson 1991 and Ritchie 2000 are studies with a moderate risk of bias; the others have a high risk of bias. Chande 1994 measured compliance by asking if patients had called their primary care physician and if they had filled their prescriptions. Jones 1988 measured compliance with scheduling and keeping an appointment. Nelson 1991 measured compliance by the appropriate use of follow-up care, including keeping appointments, following instructions, using the primary care centre rather than the ED for non-urgent care, and using the telephone prior to or instead of coming to the hospital for an unscheduled visit. Ritchie 2000 measured compliance in making and attending appointments. The two common points in these four studies, suitable for data pooling, are making an appointment/calling the doctor (Chande 1994; Jones 1988; Ritchie 2000) and keeping an appointment (Jones 1988; Nelson 1991; Ritchie 2000). All four studies measured these outcomes retrospectively at different points in time, but this does not hinder comparison since they all measured making/keeping appointments that were considered to be necessary. All four studies had usual care as control condition. Jones 1988 used two additional control groups (but only the usual care control groups are taken in consideration for this comparison). The meta-analyses show effect estimates in support of the TFU intervention group, both for making an appointment (RR 1.70, 95% CI 0.92 to 3.14) (see Comparison 02, Outcome 02) and for keeping an appointment (RR 1.58, 95% CI 1.01 to 2.48) (see Comparison 02, Outcome 03). However, confidence intervals for both poolings are large and tests show considerable statistical heterogeneity.

Analysis 02.02. Comparison 02 Effect of TFU on compliance
Outcome 02 Effect of TFU on compliance (making an appointment) in ED patients compared to usual care

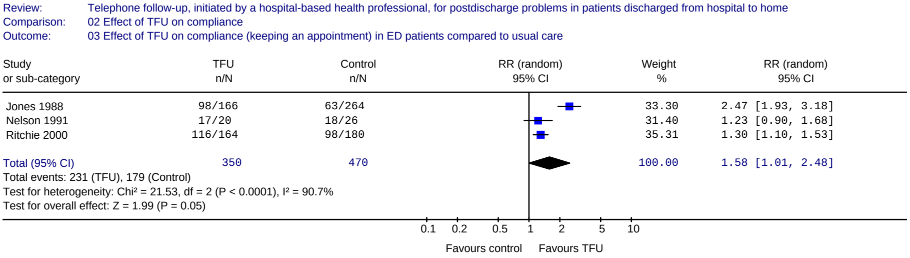


Review: Telephone follow-up, initiated by a hospital-based health professional, for postdischarge problems in patients discharged from hospital to home
Comparison: 02 Effect of TFU on compliance
Outcome: 02 Effect of TFU on compliance (making an appointment) in ED patients compared to usual care

Study or sub-category	TFU n/N	Control n/N	Weight %	RR (random) 95% CI
Chande 1994	120/133	67/132	33.12	1.78 [1.49, 2.12]
Jones 1988	141/166	87/264	33.05	2.58 [2.15, 3.10]
Ritchie 2000	145/164	147/180	33.82	1.08 [0.99, 1.18]
Total (95% CI)	463	576	100.00	1.70 [0.92, 3.14]

Total events: 406 (TFU), 301 (Control)
Test for heterogeneity: Chi² = 104.78, df = 2 ($P < 0.00001$), I² = 98.1%
Test for overall effect: Z = 1.69 (P = 0.09)

Analysis 02.03. Comparison 02 Effect of TFU on compliance
Outcome 03 Effect of TFU on compliance (keeping an appointment) in ED patients compared to usual care



Review: Telephone follow-up, initiated by a hospital-based health professional, for postdischarge problems in patients discharged from hospital to home
Comparison: 02 Effect of TFU on compliance
Outcome: 03 Effect of TFU on compliance (keeping an appointment) in ED patients compared to usual care

Study or sub-category	TFU n/N	Control n/N	Weight %	RR (random) 95% CI
Jones 1988	98/166	63/264	33.30	2.47 [1.93, 3.18]
Nelson 1991	17/20	18/26	31.40	1.23 [0.90, 1.68]
Ritchie 2000	116/164	98/180	35.31	1.30 [1.10, 1.53]
Total (95% CI)	350	470	100.00	1.58 [1.01, 2.48]

Total events: 231 (TFU), 179 (Control)
Test for heterogeneity: Chi² = 21.53, df = 2 ($P < 0.0001$), I² = 90.7%
Test for overall effect: Z = 1.99 (P = 0.05)

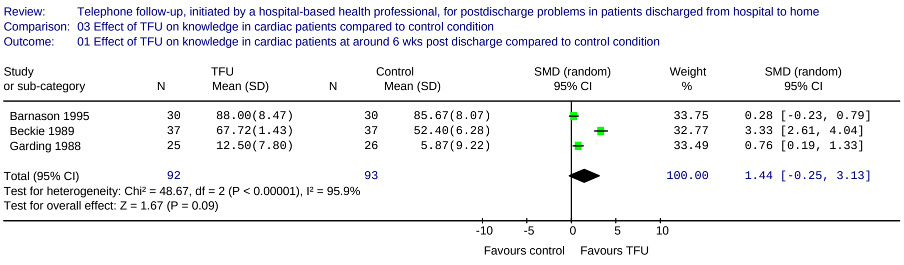
G) *Effect of TFU on compliance in paediatric patients*

Compliance in paediatric patients was studied by Chande 1994, Mohan 1999 and Nelson 1991; two of these studies concern paediatric patients attending the ED and the other concerned infants requiring apnea monitoring. These samples are considered too clinically heterogeneous and were not pooled; moreover the studies of paediatric patients in the ED (Chande 1994; Nelson 1991) are already included in comparison F) above.

H) *Effect of TFU on knowledge in cardiac patients compared to control condition*

Three studies measured knowledge in cardiac patients (Barnason 1995; Beckie 1989; Garding 1988). Garding 1988 was rated as having a moderate risk of bias; the others as having a high risk of bias. Barnason 1995 and Beckie 1989 involve cardiac surgery patients and Garding 1988 cardiac patients who have been hospitalised for an acute myocardial infarction. All three studies used self-developed instruments of which two (Beckie 1989; Garding 1988) were based on an earlier instrument of Horn and Swain. Beckie 1989 and Garding 1988 had usual care as comparison, while Barnason 1995 used two control groups (one received in-hospital teaching only, the other in-hospital teaching plus post discharge group teaching; for this meta-analysis we used data from the in-hospital teaching only control group). It is not exactly clear when the outcomes were measured, but all had to be around four to eight weeks post discharge. The meta-analysis did not reveal a statistically favourable effect for the TFU (SMD 1.44, 95% CI -0.25 to 3.13) (see Comparison 03, Outcome 01), but here also tests show considerable statistical heterogeneity.

Analysis 03.01. Comparison 03 Effect of TFU on knowledge in cardiac patients compared to control condition
Outcome 01 Effect of TFU on knowledge in cardiac patients at around 6 weeks post discharge compared to control condition



Review: Telephone follow-up, initiated by a hospital-based health professional, for postdischarge problems in patients discharged from hospital to home
Comparison: 03 Effect of TFU on knowledge in cardiac patients compared to control condition
Outcome: 01 Effect of TFU on knowledge in cardiac patients at around 6 wks post discharge compared to control condition

Study or sub-category	N	TFU Mean (SD)	N	Control Mean (SD)	SMD (random) 95% CI	Weight %	SMD (random) 95% CI
Barnason 1995	30	88.00(8.47)	30	85.67(8.07)		33.75	0.28 [-0.23, 0.79]
Beckie 1989	37	67.72(1.43)	37	52.40(6.28)		32.77	3.33 [2.61, 4.04]
Garding 1988	25	12.50(7.80)	26	5.87(9.22)		33.49	0.76 [0.19, 1.33]
Total (95% CI)	92		93			100.00	1.44 [-0.25, 3.13]

Test for heterogeneity: Chi² = 48.67, df = 2 (P < 0.00001), I² = 95.9%
Test for overall effect: Z = 1.67 (P = 0.09)

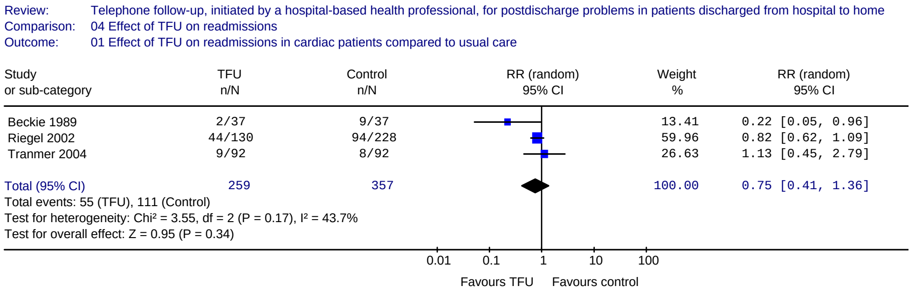
Comparisons related to health services oriented outcomes

In this section, pooling was possible for readmission data in three patient categories, and for ED visits in surgery patients.

I) Effect of TFU on readmissions in cardiac patients compared to usual care

Readmissions in cardiac patients were studied by Beckie 1989, Riegel 2002, Tranmer 2004 and Weaver 2001. Tranmer 2004 was rated as having a moderate risk of bias; the others were rated as having a high risk of bias. Riegel 2002 involved medical patients with heart failure, and the other studies involved cardiac surgery patients. Three measured readmissions by status analysis of hospital records, and one (Tranmer 2004) by patient self-report. One retrospected the first month, the second the first five weeks, the third the first six weeks and the fourth one the first three months, so possible variations between studies can be attributed to the time period, but the effects do not hamper comparisons between intervention and control. Since Weaver 2001 does not differentiate between ED visits and readmissions, this is excluded from the analysis. The pooled effect is not statistically significant (RR 0.75, 95% CI 0.41 to 1.36) (see Comparison 04, Outcome 01). Tests for statistical homogeneity are within an acceptable range.

Analysis 04.01. Comparison 04 Effect of TFU on readmissions
Outcome 01 Effect of TFU on readmissions in cardiac patients compared to usual care



Review: Telephone follow-up, initiated by a hospital-based health professional, for postdischarge problems in patients discharged from hospital to home
Comparison: 04 Effect of TFU on readmissions
Outcome: 01 Effect of TFU on readmissions in cardiac patients compared to usual care

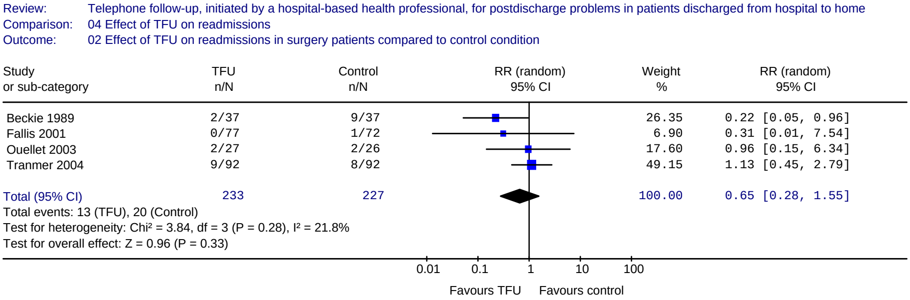
Study or sub-category	TFU n/N	Control n/N	Weight %	RR (random) 95% CI
Beckie 1989	2/37	9/37	13.41	0.22 [0.05, 0.96]
Riegel 2002	44/130	94/228	59.96	0.82 [0.62, 1.09]
Tranmer 2004	9/92	8/92	26.63	1.13 [0.45, 2.79]
Total (95% CI)	259	357	100.00	0.75 [0.41, 1.36]

Total events: 55 (TFU), 111 (Control)
Test for heterogeneity: Chi² = 3.55, df = 2 (P = 0.17), I² = 43.7%
Test for overall effect: Z = 0.95 (P = 0.34)

J) Effect of TFU on readmissions in surgery patients compared to control condition

Readmissions in surgery patients were studied by Beckie 1989, Fallis 2001, Ouellet 2003, Tranmer 2004 and Weaver 2001. Only Tranmer 2004 was rated as having a moderate risk of bias; the others are at high risk of bias. Both Beckie 1989 and Tranmer 2004 were also included in comparison I, above. Four studies had usual care as comparison group; Fallis 2001 compared the TFU group to a home visit by a nurse. Three studies measured the outcome at four weeks post discharge, one at five weeks and one at six weeks. Ouellet 2003 is problematic in that the author only states that there were four readmissions in the total group and that there were no significant differences, but does not present exact data for both groups; for the meta-analysis we used two readmissions in the treatment group and two in the control group for this study. Again, as Weaver 2001 does not differentiate between ED visits and readmissions this study's data is excluded from this comparison. The pooled effect is not significant (RR 0.65, 95% CI 0.28 to 1.55) (see Comparison 04, Outcome 02) and tests for statistical homogeneity are within an acceptable range.

Analysis 04.02. Comparison 04 Effect of TFU on readmissions
Outcome 02 Effect of TFU on readmissions in surgery patients compared to control condition


Review: Telephone follow-up, initiated by a hospital-based health professional, for postdischarge problems in patients discharged from hospital to home
Comparison: 04 Effect of TFU on readmissions
Outcome: 02 Effect of TFU on readmissions in surgery patients compared to control condition

Study or sub-category	TFU n/N	Control n/N	Weight %	RR (random) 95% CI
Beckie 1989	2/37	9/37	26.35	0.22 [0.05, 0.96]
Fallis 2001	0/77	1/72	6.90	0.31 [0.01, 7.54]
Ouellet 2003	2/27	2/26	17.60	0.96 [0.15, 6.34]
Tranmer 2004	9/92	8/92	49.15	1.13 [0.45, 2.79]
Total (95% CI)	233	227	100.00	0.65 [0.28, 1.55]

Total events: 13 (TFU), 20 (Control)
Test for heterogeneity: Chi² = 3.84, df = 3 (P = 0.28), I² = 21.8%
Test for overall effect: Z = 0.96 (P = 0.33)

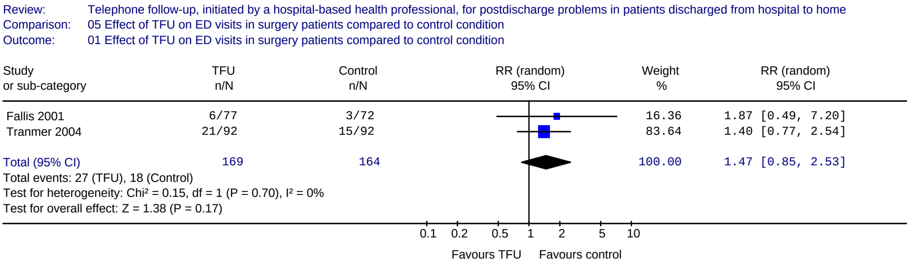
K) Effect of TFU on readmissions in neurology patients

Readmissions in neurology patients are studied by Phillips 1999 and Phillips 2001 (in spinal cord injury patients). However readmission rates were measured over the first year and not specified for the time frame of 3 months as required for this review.

L) Effect of TFU on ED visits in surgery patients compared to control condition

The final potential meta-analysis for this review concerns surgery patients' visits to the ED, which has been studied by Fallis 2001, Ouellet 2003, Tranmer 2004 and Weaver 2001. However, Ouellet 2003 summarised ED visits together with unanticipated clinic visits and does not present specific data for ED visits, (either for the control or the intervention group) and so can not be included in this comparison. Also Weaver 2001 does not differentiate between ED visits and readmissions, and so is also excluded from the analysis. Data from Fallis 2001 and Tranmer 2004 were pooled (Fallis 2001 rated as having a high risk of bias, and Tranmer 2004 a moderate risk of bias). Tranmer 2004 had usual care as comparison group and Fallis 2001 compared the TFU group to a home visit by a nurse. The pooled effect is not significant (RR 1.47, 95% CI 0.85 to 2.53) (see Comparison 05, Outcome 01). Tests for statistical homogeneity are within an acceptable range.

Analysis 05.01. Comparison 05 Effect of TFU on ED visits in surgery patients compared to control condition
Outcome 01 Effect of TFU on ED visits in surgery patients compared to control condition


Review: Telephone follow-up, initiated by a hospital-based health professional, for postdischarge problems in patients discharged from hospital to home
Comparison: 05 Effect of TFU on ED visits in surgery patients compared to control condition
Outcome: 01 Effect of TFU on ED visits in surgery patients compared to control condition

Study or sub-category	TFU n/N	Control n/N	RR (random) 95% CI	Weight %	RR (random) 95% CI
Fallis 2001	6/77	3/72		16.36	1.87 [0.49, 7.20]
Tranmer 2004	21/92	15/92		83.64	1.40 [0.77, 2.54]
Total (95% CI)	169	164		100.00	1.47 [0.85, 2.53]

Total events: 27 (TFU), 18 (Control)
Test for heterogeneity: Chi² = 0.15, df = 1 (P = 0.70), I² = 0%
Test for overall effect: Z = 1.38 (P = 0.17)

6.4. Discussion

This review included 33 studies measuring the effects of telephone follow-up (TFU) in 5110 patients. The poor methodological quality of the included studies is a major limitation of this review. No included study had a low risk of bias, seven had a moderate risk of bias and 26 had a high risk of bias. Moreover this review deals with a high degree of clinical diversity and statistical heterogeneity in several elements, and most studies have small sample sizes. Together, this means that drawing conclusions is very difficult, and any conclusions cannot be stated firmly.

In terms of our primary outcomes, we can draw no firm conclusions. Many different outcomes have been measured in the included studies, but only a few outcomes are measured more than one study. Moreover, many outcomes in this field are poorly defined. They are based on different and poorly described conceptual foundations. Many terms are used for the same phenomenon. There are many overlapping terms. Measurement instruments vary and are often are unvalidated.

The fact that few outcomes were measured across more than one study made only limited pooling possible. As far as meta-analysis was possible, most comparisons suffered from considerable statistical heterogeneity and all pointed towards clinical equivalence.

There might be effects of the intervention which could not be shown. This may be due to poor methodological quality, (too) small sample sizes and/or insensitive instruments. We must question whether there was sufficient contrast in the studies: many studies compare TFU with usual care but do not describe what the usual care consisted of. Also, it is important to consider the extent to which patients may have received discharge preparation in hospital. It is possible that lack of contrast masks the effect of a TFU intervention.

The large heterogeneity in the interventions might also partly explain the lack of effects. Variety was evident in the people who delivered the TFU intervention, as well as in the frequency, duration, starting time, structure and aims, and in other aspects. The extent to which the intervention is comparable across and within the studies is questionable. It seems that there is no agreement about the critical elements of an effective TFU intervention. The heterogeneity can also partly be explained by the different aims of the TFU intervention: enhancing compliance with referrals might require one form of TFU, and reducing anxiety and uncertainty, or improving a patient's knowledge of their symptoms, another form. Moreover, many studies combined several of these aims. Narrowing the inclusion criteria for this review would have improved the homogeneity of the included studies, but would have resulted not only in a very small number of included studies being identified, but also in 'laboratory' studies which do not reflect real world circumstances.

TFU can be regarded as a 'socially complex intervention', a term used by Lindsay (Lindsay 2004) to denote interventions that are characterised by actions that are difficult to define, and by varied, and difficult to control, contextual factors. Both TFU and the comparison interventions are dependent on individual professionals, individual patients, social interactions and social settings, which makes it hard to define, to standardise and to adequately describe what is being done. Many factors, therefore, may mask the effects.

Another point of discussion is given by the study of Faulkner 2000. The author found no significant differences in compliance in the short term (3 months) but did find differences after that period up to two years later. We should consider whether three months is too early to see the effects of TFU - but is two years realistic?

It should also be noted, however, that none of the included studies show effects in favour of the control group. Moreover, some of the studies report that patients value the TFU calls, although it seems remarkable that this is not reflected in the measured empirical outcomes. We must question, therefore, whether the scales are the right ones to measure the effects, and whether the measurement tools are sensitive enough.

Also, we note that some individual studies found effects in favour of the TFU group. The Dutch Patients and Consumers Federation commented (during the preparation of this review) that patients' appreciation of the call indicates that TFU deserves a place in aftercare. To stop TFU based on the lack of firm conclusions in this review, may be to throw the baby out with the bath water. However, we strongly emphasise that questions remain about: the ideal person to deliver the intervention; the best time to start TFU; the number of follow-up calls needed and the ideal period of time for their delivery; the ideal structure and content of TFU, a possible need for variations in TFU for different patient categories; differences across countries and health systems, the nature and timing of effects to be expected of TFU, and many other issues. We need large scale, high quality studies with more comparable (and better reported) interventions and with sufficiently sensitive validated tools, in order to answer these questions.

6.5. Authors' conclusions

Implications for practice

Some individual studies included in this review identify some effects in favour of telephone follow-up (TFU), and no study reported adverse effects of the intervention. Nevertheless we cannot conclude that TFU is an effective intervention. Nor is there conclusive evidence to exclude TFU from discharge planning activities.

Implications for research

Research in this field should focus on the many questions as stated in the discussion. Clear and detailed descriptions of the strategies in both the intervention and control arms are needed. We note also the poor methodological quality of the included studies. For instance the criterion of reliable outcome measurement was frequently not met because outcomes were not assessed by two people, and consequently interrater agreement could not be reported; this is something that easily can be resolved. The same applies for the criteria blinded assessment of outcomes and concealment of allocation, which can quite easily be met by increased rigor in research protocols. There remain many challenges ahead, for instance to develop adequately sensitive instruments for the outcomes that can be addressed by TFU. Improved theoretical exploration of the relationship between interventions and outcomes is needed: what and when effects may be expected of TFU, and what instruments are suitable and sensitive enough to measure them? There is a need for large scale, well-designed studies with uniform and well-described interventions and outcomes.

Notes

The protocol for this review was first published on issue 4, 2003 of the Cochrane Library.

The protocol was amended as of issue 3, 2004 of The Cochrane Library. We added a sixth inclusion criterion, that states that only studies in which the effect of the TFU can be isolated and analyzed, will be included. This extra inclusion criterium has no consequences for the search strategy, and no other studies will be included or excluded than was originally intended. The extra inclusion criterium is needed because studies wherein the effect of the TFU cannot be isolated do not add to the aim of this review. Moreover, the review is not intended to compare TFU interventions to multi-component interventions.

Potential conflict of interest

One of the review authors (PM) is also a co-author of an included study (Boter 2000) in the review.

Acknowledgements

Protocol:

We thank all referees from the Cochrane Consumers and Communication Review Group and from the NIVEL, Netherlands Institute for Healthcare Services Research, for their very useful comments on the protocol and the text of the review. We also thank the editors and staff of the Consumers and Communication Review Group; particularly Ms Judy Stoelwinder for her assistance with the search strategy for this review.

We thank NIVEL, the Netherlands Institute for Healthcare Services Research, which provided support to this review in the form of a workstation and email and internet facilities, as well as a budget of 1500 Euro for retrieving papers. The comments and support of the scientific staff of the NIVEL, and especially of Prof. Dr. J. van der Zee and Dr. A.L. Francke, were very welcome.

Review:

- Ms. Judy Stoelwinder, Consumers and Communication Review Group, assisted with the search strategies for this review.
- Ms. Anne Vicky Carlier, Netherlands Institute for Health Care Services Research, performed all interlibrary loans.

- Mr. Rob Scholten, Dutch Cochrane Center, checked the statistical analyses.
- Ms. Atie Schipaanboord commented on the text of the review from the perspective of the Dutch Patients and Consumers Federation.
- Mr. Jouke van der Zee and Ms. Anneke Francke of the Netherlands Institute for Health Care Services Research, gave general scientific advice on the review.
- The scientific committee of the Netherlands Institute for Health Care Services Research commented the protocol and the text of the review.
- The editors and staff of the Consumers and Communication Review Group, and especially Dr. Megan Prictor and Dr. Sophie Hill, gave general advice, comments and above all support in writing the protocol and the text of the review.

Sources of support

External sources of support

- No sources of support supplied

Internal sources of support

- NIVEL, Netherlands Institute for Health Care Services Research Netherlands

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* *Indicates the major publication for the study*

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7 Interventions aimed at reducing problems in adult patients discharged from hospital to home: a systematic meta-review

Mistiaen P, Francke AL & Poot E: **Interventions aimed at reducing problems in adult patients discharged from hospital to home: a systematic meta-review**.
BMC Health Services Research, 2007, **7**: 47

Abstract

Background

Many patients encounter a variety of problems after discharge from hospital and many discharge (planning and support) interventions have been developed and studied. These primary studies have already been synthesized in several literature reviews with conflicting conclusions. We therefore set out a systematic review of the reviews examining discharge interventions. The objective was to synthesize the evidence presented in literature on the effectiveness of interventions aimed to reduce post-discharge problems in adults discharged home from an acute general care hospital.

Methods

A comprehensive search of seventeen literature databases and twenty-five websites was performed for the period 1994-2004 to find relevant reviews. A three-stage inclusion process consisting of initial sifting, checking full-text papers on inclusion criteria, and methodological assessment, was performed independently by two reviewers. Data on effects were synthesized by use of narrative and tabular methods.

Results

Fifteen systematic reviews met our inclusion criteria. All reviews had to deal with considerable heterogeneity in interventions, populations and outcomes, making synthesizing and pooling difficult.

Although a statistical significant effect was occasionally found, most review authors reached no firm conclusions that the discharge interventions they studied were effective.

We found limited evidence that some interventions may improve knowledge of patients, may help in keeping patients at home or may reduce readmissions to hospital. Interventions that combine discharge planning and discharge support tend to lead to the greatest effects. There is little evidence that discharge interventions have an impact on length of stay, discharge destination or dependency at discharge. We found no evidence that discharge interventions have a positive impact on the physical status of patients after discharge, on health care use after discharge, or on costs.

Conclusions

Based on fifteen high quality systematic reviews, there is some evidence that some interventions may have a positive impact, particularly those with educational components and those that combine pre-discharge and post-discharge interventions. However, on the whole there is only limited summarized evidence that discharge planning and discharge support interventions have a positive impact on patient status at hospital discharge, on patient functioning after discharge, on health care use after discharge, or on costs.

7.1. Background

Going back home from hospital is not always a smooth process. Many studies from all over the world have repeatedly reported that many people who have been discharged from hospital to home, especially the elderly, encounter a variety of problems in the first weeks after their return home. Problems after discharge include dependence on others with regard to household activities [1-6], lower levels of independence in activities of daily living and self-care deficits [2,3,5-12], difficulty with reading medication labels or instilling eyedrops [13,14], not getting the help they needed [4,5,13,15-23], not being aware of available services [24-26], informational needs [4,13,26-30], symptom distress [28,31-33], social problems [34] and emotional problems as anxiety and uncertainty [7,29,35]. The post-discharge problems seem to be more common with increased age and in women [36] and may lead to further complications and unplanned hospital readmissions.

In addition, lengths of hospital stay have dropped steeply in the last few decades, e.g. from 6.5 days in 1985 to 4.8 days in 2003 in the USA (with the greatest decline for people aged 65 years and older [37]), from 10.5 days in 1985 to 6.9 days in 2003 in the European Union [38], and from 12.5 days in 1985 to 7.3 days in 2003 in the Netherlands [39]. Consequently, the time available to a healthcare team to adequately prepare patients for discharge has virtually evaporated [40].

Discharge planning and aftercare initiatives have received much and increased attention over the past few years as a result. Rorden & Taft defined discharge planning as ‘a process made up of several steps or phases whose immediate goal is to anticipate changes in patient care needs and whose long-term goal is to ensure continuity of health care’ [41]. We defined discharge interventions as in-hospital interventions or interventions after discharge performed (partly) by hospital-based professionals, explicitly targeted to smooth the transition from hospital to home or to prevent or diminish problems after hospital discharge.

Many studies were performed with various forms of discharge planning and aftercare, e.g. screening patients with a high risk of post discharge problems [42,43], intensive in-hospital discharge preparation [44], discharge rounds [45,46], transitional and intermediate care units [32,47-50], written information leaflets [51], liaison nurses and discharge coordinators [52-55], clinical nurse specialists [56-58], home visits prior to discharge [59,60], preventive home visits of district nurses after discharge [61-63], post-hospital support programs [7,64-68], telephone follow-up after discharge [69-72], discharge planning protocols [18,73], ameliorated communication between hospital and primary care providers [74,75], and many others [76,77].

These 'discharge interventions' mostly aim to smoothen the discharge itself (generally measured by length of stay and discharge destination) or to prevent, ease or solve problems in patient's functioning after discharge (generally measured by function-measures) or to prevent readmissions to the hospital (which are generally seen as a proxy for patient problems after discharge) or to lower health care costs, related to hospital readmissions and treatment of post discharge problems.

Reviews of these studies come to different conclusions on the effectiveness of these interventions, varying from "*Discharge planning and support teams are cost effective and should be in place universally*" [78] to "*The impact of discharge planning on readmission rates, hospital length of stay, health outcomes and cost is uncertain*" [79] to '*In general, the evidence is a mixture of benefit, deficit and uncertainty, due to the complexity and variability of the interventions and methodological problems with the evaluations*' [80] and "*Evidence from RCT's is not available to support the general adoption of discharge planning protocols, geriatric assessment processes or discharge support schemes as means of improving discharge outcomes*" [81].

The mixed results of the reviews may, however, be caused by different study populations, heterogeneity of interventions, or a variety of outcomes that have been chosen. A lot of questions with regard to the optimal content and the organization of discharge planning and support remain unanswered. We therefore set out a systematic review of reviews dealing with discharge interventions.

As mentioned earlier, we defined discharge interventions as in-hospital interventions or interventions after discharge performed (partly) by hospital-based professionals, explicitly targeted to smooth the transition from hospital to home or to prevent or diminish problems after hospital discharge. These can roughly be classified in two groups:

- *Discharge preparation*: interventions that mainly take place during admission in the hospital, with the objective of organizing care and preparing patients in such a way that the length of hospital stay is as short as possible for most patients, that the condition of most patients is such that they can be discharged home and not into institutional care, that they will need as little care as possible post discharge, and that care (organizations) needed after discharge are informed and organized as well as possible, so that patients will not have unmet needs, will not have to be readmitted and will not die due to complications or deterioration after discharge.
- *Discharge support/aftercare*: interventions that mainly take place after discharge from hospital and that are targeted to prevent, ease or solve problems after discharge in order to prevent readmissions to hospital or admissions to institutional care and to maximize recovery and improve functional, emotional, social and health status in the post-discharge period.

Besides this rough two categories classification system, we considered the categorization of discharge interventions put forward by Parker et al. [81] as a useful additional framework for ordering the results of the included reviews. Parker et al. have four broad classes of 'discharge arrangements': comprehensive discharge planning protocols, comprehensive geriatric assessment programmes, discharge support arrangements and educational interventions, all of which can be either generic or disease specific. They define these as follows:

- 'Comprehensive discharge planning protocols' are interventions involving standardised actions or interventions carried out by an individual, including assessment, coordination and implementation of the discharge plan, which project post-discharge needs with the aim of preventing unnecessary readmission, maintaining the health status of patients or lessening carers' burdens.
- 'Comprehensive geriatric assessment (CGA) programmes' are programmes based either in hospital or supporting older people recently discharged from hospital. In CGA programmes the multidisciplinary, multidimensional nature of the assessment of health, rehabilitation and social care needs is formalized, often using standardized assessment instruments. The results of these formal assessments are then used either to inform or prompt treatment and management recommendations, which may be carried out in dedicated inpatient units, provided as

recommendations to the referring physician or team, or delivered in the patient’s home or other ambulatory care setting such as the day hospital or outpatient clinic. Discharge planning is usually regarded as an important component of inpatient CGA programmes, although most are not focused on discharge itself, but on improving functional health status, and thereby independent living, through medical intervention and rehabilitation.

- ‘Discharge support arrangements’ are schemes that are designed to provide support for (older) people after experiencing discharge from inpatient hospital care. These are interventions in which hospital or community staff are in contact with the patient around the time of hospital discharge, with the specific intention of providing support during the post-discharge period. The interventions may be limited to a post-discharge telephone contact at one extreme, or, at the other extreme, involve teams of professionals providing services in the patient’s home after discharge from hospital.
- ‘Educational interventions’ are interventions targeted at patients undergoing discharge from hospital that are intended to improve their ability to manage aspects of their care after discharge through the provision of information or more active education. The interventions may be limited to education, or supplemented by other activities such as home visits or telephone calls after discharge.

The objective of this meta-review was to identify, appraise and synthesize the evidence presented in reviews of the literature for the effectiveness of discharge interventions in reducing post-discharge problems in adults discharged home from an acute general care hospital. In addition to problems in patient’s functioning after discharge we sought for evidence about the effects of discharge interventions on discharge status and on health care services use and costs after discharge.

The following questions were addressed:

- What are the effects of ‘discharge interventions’ on the discharge status of patients? (length of hospital stay, discharge destination, dependency at discharge)
- What are the effects of ‘discharge interventions’ on the functioning of patients in the first 3 months after discharge? (physical status, emotional status, social status, health status)

- What are the effects of these interventions on health care services use and costs in the first 3 months after discharge? (readmissions, use of health care services post discharge, costs)

Outcomes in carers or relatives were not considered.

7.2. Methods

Data sources

We searched for reviews of the literature and reviews that are part of evidence-based guidelines containing synthesized evidence relating to discharge planning and support interventions aimed at preventing or diminishing problems in adult patients following hospital discharge.

Searches were performed in seventeen literature databases and on twenty-five websites, which are listed in Appendix 1 (see Additional file 1). All databases were searched from 1994 (or from their inception if this was later than 1994) until December 2004.

A search strategy for PUBMED was developed; which was partly based on the search filters of the Dutch Cochrane Centre for searching systematic reviews and for searching guidelines in PUBMED [82]. Suitable search strategies were developed for the other databases, as adaptations of the PUBMED search.

No limits were applied where languages were concerned.

All detailed search strategies can be found in Appendix 2 (Additional file 2).

The words “discharge planning”, “aftercare”, “hospital discharge” and “continuity of care” (or equivalents in Dutch, French or German for the non-English sites) were sequentially entered in the search frame of the sites, for the purpose of searching the websites to find systematic reviews as part of a guideline. The hits of all searches were entered into Reference Manager©, duplicates were sifted out in this program, and the inclusion process was executed thereafter.

Study selection

The manuscripts had to fulfil all of the following criteria in order to be included:

- The manuscript is a systematic review of the literature, either as an independent manuscript or as a part of a guideline (we considered a review as a systematic review if at least two out of three of the following criteria were met: a search strategy was reported, a search was performed in Pubmed at least, and the included studies were subjected to some kind of methodological assessment)

- The review concerns ‘discharge interventions’ (= in-hospital interventions or interventions after discharge performed (partly) by hospital-based professionals, explicitly targeted to smooth the transition from hospital to home or to prevent or diminish problems after hospital discharge)
- The interventions discussed in the review relate to adult patients discharged home from an acute general care hospital, who were admitted for a primarily physical problem
- The outcomes studied in the review concern patient status at discharge, patient functioning after discharge, or health care service use and costs after discharge
- The outcomes studied in the review are measured within 3 months after discharge from hospital
- None of the exclusion criteria listed below are met
- The review has sufficient methodological quality (= Overview Quality Assessment Questionnaire score ≥ 5 [83-85])

Publications were excluded when:

- They were primary research studies
- The outcomes in the review were only reported for carers or professionals
- The review involved only paediatric or psychiatric patients
- The review involved only emergency department (ED) patients or one-day stay procedures
- The review concerned interventions that are primarily intended to address the problems of caregivers rather than of patients
- The experimental interventions discussed in the review are performed after discharge solely by primary care providers

Since there is no generally accepted definition of what a postdischarge period means, and the duration of postdischarge problems may vary for different illnesses and treatment procedures, the choice of a time period of 3 months as inclusion criterion had to be arbitrary. There is evidence, however, that most postdischarge problems occur in the period immediately after discharge: Naylor states in her review [86] that *'4 to 6 weeks post* *discharge represents a critical period when many elders are at highest risk for poor discharge outcomes*' and empirical research in a mixed population has shown that postdischarge problems are greater at 7 days post discharge than at 30 days post discharge [43]. Moreover, three months is a period for which it is reasonable to assume that outcomes can be related to the intervention around or in the first month after discharge.

A three-stage inclusion process was applied. Titles and abstracts of articles identified from the search strategies were screened in the first stage of initial sifting, in order to determine their relevance and whether they fulfilled the inclusion criteria. For each study the criteria were judged from top to bottom of the inclusion criteria referred to; no further analysis was done on the subsequent criteria as soon as one criterion was not met. In this first stage (which is more focused on excluding than on including), one reviewer screened all references and the second reviewer independently checked a 10% random sample of the references. If agreement between the two reviewers on whether to exclude studies was lower than 95% for the 10% sample, the second reviewer would proceed to check the other 90% of the sample. In addition, 10% of the references that were excluded by the first reviewer were checked by a second reviewer. When the title and/or abstract provided insufficient information to determine relevance, full paper copies of the articles were ordered and they proceeded to the second stage. In case articles were published in a language in which the reviewers were not fluent, assistance was sought from other colleagues who mastered that language.

In the second stage, two reviewers independently examined all full paper copies of the articles selected in the first stage, in order to determine whether they fulfilled the inclusion criteria.

The criteria were again judged from top to bottom for each study; no further assessment was done on the subsequent criteria as soon as a criterion was not met. Any disagreements were resolved by discussion between the two reviewers; if no agreement could be reached, a third reviewer decided.

The third stage of inclusion related to the methodological assessment of the reviews. All reviews remaining after the second stage were assessed with the Overview Quality Assessment Questionnaire [83-85]. This instrument is one of the most frequently used appraisal instruments for systematic reviews in the biomedical literature [87], besides being one of the few found for which psychometric properties had been documented [88] and which had been found to meet several important criteria, such as construct validity, interobserver reliability and coverage of the items in the QUORUM statement for reporting systematic reviews [89]. Scores on this instrument can vary from 1 (extensive flaws) to 7 (minimal flaws). Two reviewers performed this assessment independently. The mean of the scores of the two reviewers was computed and classified as the final quality judgment; in case the scores of the reviewers differed more than 2 points, reviewers discussed their assessments and came to a new joint score (this was only needed once, mean difference score was 0.91).

Only high quality reviews (= with mean scores of 5 (minor flaws) and above) were used for the data-extraction, as is proposed by Jadad et al. [90] and Peach [91], since it is known that low quality reviews may reach different conclusions than high quality reviews [92-94], and also to avoid false conclusions that are based on low quality evidence.

Data-analysis and synthesis

Data were extracted about the applied in- and exclusion criteria for the primary studies, search strategies, studied interventions, time frame of the searches, selected outcomes, and selected patient populations, effects on patients, effects on health care use and costs.

As stated earlier two categorizations for the interventions were used to organize the data. Firstly, the rough two categories system of discharge interventions, divided in discharge preparation and discharge support interventions; secondly the categorization of Parker et al.[81], who distinguish four broad classes of ‘discharge arrangements’: comprehensive discharge planning protocols, comprehensive geriatric assessment programmes, discharge support arrangements and educational interventions, all of which can be either generic or disease specific. The definitions of each category are already given in the Background of this article.

The outcomes were classified according to the research questions:

- The discharge status of patients: length of hospital stay, discharge destination, dependency at discharge
- The functioning of patients in the first 3 months after discharge: physical status, emotional status, social status, health status
- Health care services use and costs: readmissions, use of health care services post discharge, costs

Physical status concerns all measures about level of activities of daily living, self-care abilities, self efficacy or independence. Emotional status concerns all measures about the level of well-being of patients such as uncertainty, anxiety, depression, informational needs, mood or coping. Social status refers to the extent a patient is able to participate in normal social activities and relationships. Health status concerns symptom prevalence and burden, organ dysfunction, mortality, morbidity and physical complications. However, these categories are not always mutual exclusive, e.g. in the case where multi-dimensional quality of life measures were used.

Whether an outcome was regarded as a positive or a negative effect, was primarily based on the perspective and definitions used by the review authors. However, in general a shorter length of hospital stay, home as discharge destination, better physical, emotional and social functioning, better health status, less readmissions, less use of health care services and less costs were regarded as positive outcomes by the review authors, and consequently by us.

Data-analysis was done primarily by description of the interventions and by making cross-tables for the different interventions, populations and effects. No quantitative pooling was performed across the reviews.

Conclusions for the meta-review were based on the conclusions and results of meta-analyses presented in the reviews studied.

7.3. Results

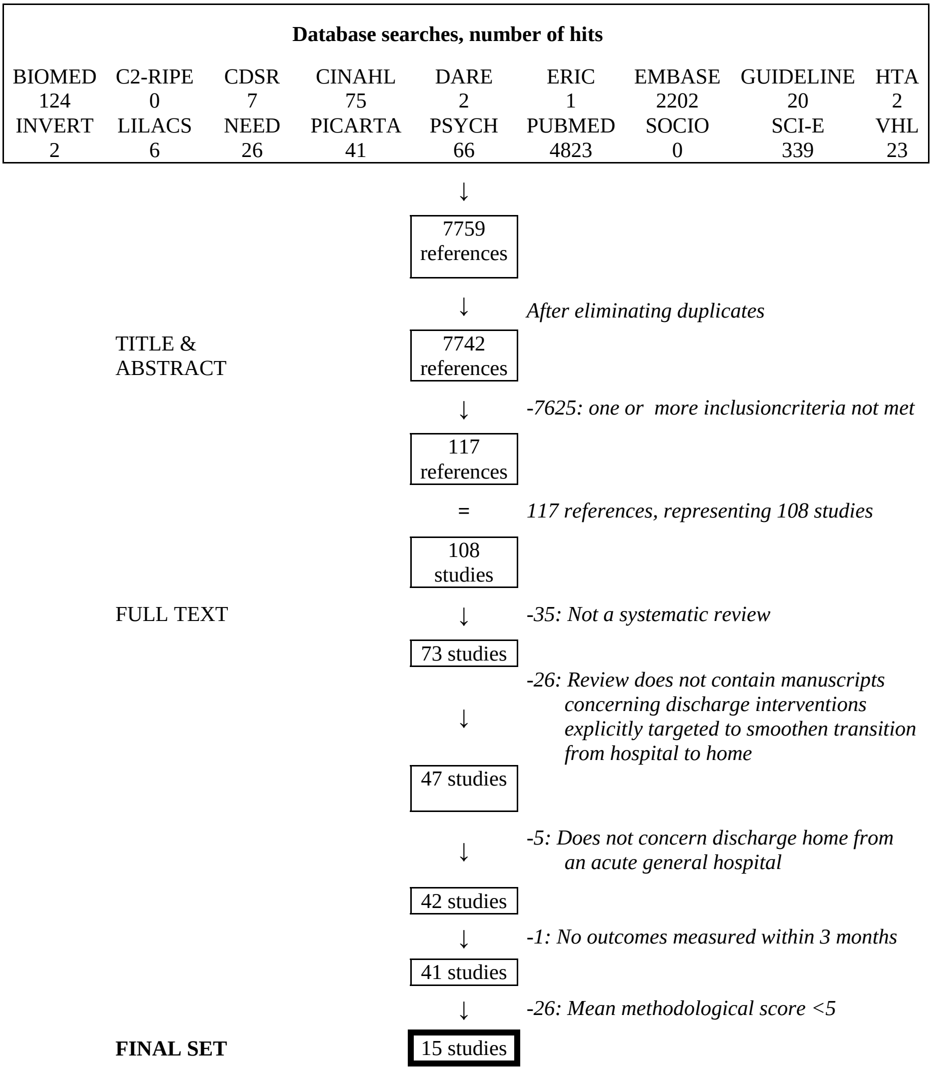
Search and inclusion results

After duplicates had been removed, the searches in the different databases resulted in an initial set of 7442 references of potential interest. Initial sifting based on title and abstract reduced this set to 117 references. As said, the first reviewer carried out this process and a 10% random sample was also done independently by a second reviewer (crude agreement between reviewers was 99% with a kappa coefficient of 0.33). In addition, when a second reviewer checked a 10% random sample of the excluded references, discussion was only needed for two references and resulted in an exclusion-decision. The set of the 117 references, representing 108 reviews, was ordered full text for the second stage of the inclusion process. Two reviewers performed this second phase independently; agreement between reviewers in this phase was 79% with a kappa coefficient of 0.56. Discussion was needed for 23 references and agreement was subsequently reached. A set of 49 references, representing 41 reviews, finally proved to fulfil the inclusion criteria for type and content of study.

In the following stage, two reviewers independently assessed the remaining 41 reviews on their methodological quality, using the Overview Quality Assessment Questionnaire [83-85] proposed by Oxman. A mean of the two scores was computed and classified as the final quality judgment. Twenty-six reviews had a mean quality score lower than 5 and were excluded, while the remaining fifteen high quality reviews [79,81,95-107] advanced to the next stage of the review, for data-extraction and analysis.

The flow diagram of the inclusion process is shown in Figure 7.1. References of the studies excluded and the reason for exclusion can be found in Appendix 3 (see Additional file 3).

Figure 7.1 Flow diagram of the inclusion process



Characteristics of the final 15 reviews

Publication date of the reviews and the journals in which they were published

All reviews included date from 2000 or later and five were published in 2004. The oldest reference included in a review dates from 1964 and the most recent one from 2004. Search periods for each review are shown in Table 7.1.

Table 7.1 Search periods in included reviews

Review	**Search period**
Cameron 2002	inception-2002
Cole 2001	1975-2000
Day 2004	1980-2003
Gwadry 2004	inception-2000
Handoll 2004	inception-2004
Hyde 2000	inception-1997
Kwan 2002	1975-2003
Outpatient Service Trialists (OST) 2003	inception-2001
Parker G 2000	1988-1999
Parker S 2002	inception-2001
Phillips 2004	inception-2003
Richards 2003	inception-2000
Shepperd 2001	inception-2001
Shepperd 2004	inception-2002
Teasell 2003	1995-2002

The reviews were published in eight different journals; six reviews [79,95,99,101,102,106] were published as a review in the Cochrane Database of Systematic Reviews.

Type and number of studies included in the reviews

Since all included reviews were focused on effectiveness, all reviews limited their inclusion criteria to comparative research designs. Seven reviews [81,98,102,104-107] were limited to randomized controlled trials only, while the other eight also included other comparative designs, such as quasi-randomized trials, non-randomized comparative studies and before-after designs. Two review authors [97,103] additionally searched for other reviews and guidelines and used these to reach their conclusions.

The fifteen reviews included a total of 265 different primary studies, the number of primary studies included in an individual review varying from 8 [98] to 71 [81]. Most (200 of the 265) of the primary studies were included only once in a review, with the exception of a few papers that were included in more than one review, extending to four inclusions for ten primary studies and with a maximum of five inclusions for two primary studies. A list of all primary studies included in one of the reviews can be found in Appendix 4 (see Additional file 4).

Aims of the reviews

The aims of the reviews included are all related to the effectiveness of discharge interventions, but there is a wide variation in what review authors describe as their objectives, as can be seen in Table 7.2.

Table 7.2 Aim of review, as worded by review-authors

Review	**Aim**
Cameron 2002	to examine the effectiveness and cost effectiveness of specialised multidisciplinary inpatient rehabilitation supervised by a geriatrician or rehabilitation physician compared with usual (orthopedic) care, for older patients with proximal femoral fracture
Cole 2001	to determine the impact of geriatric post-discharge services on mental state
Day 2004	to provide the evidence base on the effectiveness of specialist geriatric services for developing a sound practice framework
Gwadry 2004	to evaluate the effectiveness of multidisciplinary heart failure management programs on hospital admission rates
Handoll 2004	to evaluate the effects of different mobilisation strategies and programmes after hip fracture surgery
Hyde 2000	to investigate the effects of supported discharge after an acute admission in older people with undifferentiated clinical problems

Table 7.2 Continued

Review	**Aim**
Kwan 2002	to assess the effects of care pathways, compared with standard medical care, among patients with acute stroke who had been admitted to hospital. In particular we aimed to assess the effects on functional outcome, process of care, quality of life and the hospitalisation costs
OST 2003	to assess the effects of therapy-based rehabilitation services targeted towards stroke patients resident in the community within one year of stroke onset or discharge from hospital following stroke
Parker G 2000	to establish both the volume and strength of existing evaluative research on the costs, quality and effectiveness of different locations of acute, post- and subacute and rehabilitation care for older people
Parker S 2002	to test the following hypotheses: 1. There is an inadequate number of comparable rct's to allow a definitive analysis; 2. Hospital discharge process, outcome and cost-effectiveness can be improved through the use of a variety of interventions; 3. Some interventions are more effective than others; 4. there are priority areas for future research
Phillips 2004	to evaluate the effect of comprehensive discharge planning plus post-discharge support in patients with chronic heart failure on the rate of readmission, all cause mortality, length of stay, quality of life and medical costs
Richards 2003	to determine the effectiveness and costs of interventions intended to improve access to health and social care for older patients following discharge from acute hospitals
Shepperd 2001	to assess the effects of hospital at home compared with in-patient hospital care
Shepperd 2004	to determine the effectiveness of planning the discharge of patients moving from hospital
Teasell 2003	to assess the effectiveness of early supported discharge programs in the context of stroke rehabilitation

Patients of interest in the reviews

Some of the reviews included studies in which interventions targeted several or mixed patient populations, while others were restricted to studies with a specified patient group only (e.g. stroke patients, hip fracture patients, elderly or patients with heart failure). A combination was sometimes made of elderly patients and a specific medical condition. An overview is presented in Table 7.3.

Table 7.3 Patients of interest in the reviews

Review	**Several/ mixed**	**Elderly**	**Stroke patients**	**Patients with hip or femur fractures**	**Patients with heart failure**
Cameron 2002				X	
Cole 2001		X			
Day 2004		X			
Gwadry 2004					X
Handoll 2004				X	
Hyde 2000		X			
Kwan 2002			X		
OST 2003			X		
Parker G 2000		X			
Parker S 2002		X			
Phillips 2004					X
Richards 2003		X			
Shepperd 2001	X				
Shepperd 2004	X				
Teasell 2003			X		
Total	2	6	3	2	2

Interventions studied in the reviews

As said, we used two categorization systems for the discharge interventions. For this paragraph only the results for the rough two categories system is presented. The grouping of the results by the second categorization system of Parker et al. [81] is presented in the more detailed section about the effectiveness of interventions later on.

According to the first system discharge interventions are classified into two groups, discharge preparation and discharge support interventions.

Some of the reviews included only studies that used interventions from the first group, others only included studies that used interventions from the second group, and a third category comprised reviews that included studies in which interventions from both groups had to be applied. The focus of the reviews is shown in Table 7.4.

Table 7.4 Focus of interventions in reviews

Review	**Focus on discharge preparation**	**Focus on discharge support / aftercare**
Cameron 2002	X	
Cole 2001		X
Day 2004	X	X
Gwadry 2004		X
Handoll 2004	X	X
Hyde 2000		X
Kwan 2002	X	
OST 2003		X
Parker G 2000		X
Parker S 2002	X	X
Phillips 2004	X	X
Richards 2003	X	X
Shepperd 2001		X
Shepperd 2004	X	
Teasell 2003		X
Total	8	13

Interventions included in discharge preparation reviews were care pathways, patient management schemes, specialized units (for stroke, hip fracture or geriatric patients for example), geriatric assessment and/or consultation, discharge coordinators, nurse specialists, educational interventions, intensified rehabilitation/(physio)therapy schemes, adjusting skill-mix of hospital professionals, and discharge plans.

Interventions included in the discharge support reviews were telephone follow-up, home visits, geriatric assessment and/or consultation, intensified post-discharge care (hospital at home), educational interventions and intensified rehabilitation/(physio)-therapy schemes.

The interventions included in a particular review showed considerable heterogeneity in terms of what exactly was done, by whom it was done, the way it was done, the frequency with which it was done, and the duration of the intervention.

Control conditions in the reviews

Most reviews included studies in which patients in the control condition received usual care (according to the trial authors); other reviews included studies in which the different interventions were compared against each other (e.g. different rehabilitation/therapy schemes). The problem with the first category for all review authors was that the trial authors were not clear on what constituted ‘usual care’.

Outcomes studied in the reviews

Some of the included reviews had well described primary outcomes that to had be described in the trials before they could be included, while others had no criteria at all with regard to outcomes as long as the studies dealt with the relevant intervention. Many of the outcomes, in both the primary studies and the reviews, lacked a clear definition, however, e.g. functional status or quality of life or mental state. In addition, different terms were used across primary studies and reviews for outcomes that are related or that are probably the same (e.g. physical status or functional status or ability in activities in daily living). Above this, even similar outcomes were measured with different (frequently not validated) instruments at different times post discharge, posing problems for the review authors in combining the effects across trials, but also in combining the results from reviews for this meta-review.

Effectiveness of the discharge interventions

General picture

Although a statistically significant effect was occasionally found for a particular intervention on a particular outcome, most review authors reached no firm conclusions that the discharge interventions they studied were effective. Only two review authors [104,105] were firm in their conclusions. The conclusions as formulated by the authors are shown in Table 7.5, with formulations indicating no effects or inconclusive ones are shown in italics and formulations indicating firm conclusions are shown in bold typeface.

Table 7.5 Conclusions in included reviews

Review	**Conclusions**
Cameron 2002	The available trials had different aims, interventions and outcomes. Combined outcome measures (e.g. death or institutional care) *tended* to be better for patients receiving coordinated inpatient rehabilitation, but the results were heterogeneous and *not statistically significant*.
Cole 2001	There is *little evidence* that geriatric post-discharge services have an impact on the mental state of aged subjects.
Day 2004	This review generally supports the efficacy of specialist geriatric team services trained in geriatrics with a multidisciplinary collaborative focus undertaking assessment, rehabilitation and coordinated case management in community settings; both preventive care and supportive discharge in these settings *appear* to provide greater benefit over usual care; *however these benefits are not consistent* across all outcomes and although improvement in outcomes was often apparent, these were not always significant when compared with the comparison group. Efficacy of specialist geriatric services for inpatient settings was more diverse; this was due to the diversity of studies across the continuum of subacute, acute, postacute care in unit or ward settings with resulting heterogeneous outcomes and *only some of these outcomes showing significance* over usual care. With regard to day hospital and outpatient care, evidence for the efficacy of specialist geriatric services was lacking, with *no conclusive evidence* that the services are of greater benefit than usual care.
Gwadry 2004	This review *suggests* that specific heart failure targeted interventions significantly decrease hospital readmissions but do not affect mortality rates.

Table 7.5 Continued

Review	Conclusions
Handoll 2004	There is *insufficient evidence* from randomised trials to determine the effectiveness of the various mobilisation strategies that start either in the early post-operative period or during the later rehabilitation period
Hyde 2000	We believe that the results of this review provide reassurance that supporting discharge from hospital to home is of value. However, *important sources of uncertainty remain,* suggesting the need for further research. There was relative certainty that the proportion of those at home 6-12 months after admission is greater with supported discharge; this was associated with a consistent pattern of reduction in admission to long-stay care over the same period, without apparent increases in mortality. There was uncertainty about the effect of supported discharge on hospitalization. There were no rigorous data on functional status, patient and carer satisfaction and in consequence uncertainty about the overall effectiveness of supported discharge.
Kwan 2002	Use of stroke care pathways may be associated with positive and negative effects. Since most of the results have been derived from non-randomised studies, they are likely to be influenced by potential biases and confounding factors. There is currently *insufficient supporting evidence* to justify the routine implementation of care pathways for acute stroke management or stroke rehabilitation.
OST 2003	Therapy-based rehabilitation services targeted towards stroke patients living at home reduces the odds of a poor outcome and has a beneficial effect on a patient's ability to perform activities of daily living. *However, the evidence is derived from a review of heterogeneous interventions* and therefore further exploration of the interventions is justifiable.
Parker G 2000	Despite considerable recent development of different forms of care for older patients, *evidence about effectiveness and costs is weak.* However, evidence is also weak for longer-standing care models.
Parker S 2002	The evidence from these trials does not suggest that discharge arrangements have effects on mortality or length of hospital stay. This review supports the concept that arrangements for discharging older people from hospital can have beneficial effects on subsequent readmission rates. Interventions provided across the hospital-community interface, both in hospital and in the patient's home, showed the largest effects. *Evidence from RCT's is not available* to support the general adoption of discharge planning protocols, geriatric assessment processes or discharge support schemes as means of improving discharge outcomes.

Table 7.5 Continued

Review	Conclusions
Phillips 2004	**Comprehensive discharge planning plus postdischarge support for older people with chronic heart failure significantly reduced readmission rates and may improve health outcomes such as survival and quality of life without increasing costs.**
Richards 2003	The interventions provided and patient groups targeted by these services were heterogeneous. **There was, however, some evidence that services combining needs assessment, discharge planning and a method for facilitating the implementation of these plans were more effective than services that do not include the latter action**. The assessment of need may be insufficient in itself for the adequate provision of post-discharge care; needs assessment should be combined with a service that facilitates the implementation of care plans.
Shepperd 2001	*This review does not support the development of hospital at home services as a cheaper alternative to in-patient care*. Early discharge schemes for patients recovering from elective surgery and elderly patients with a medical condition may have a place in reducing the pressure on acute hospital beds, providing the views of the carers are taken into account. The evidence supporting hospital at home for patients recovering from stroke is *conflicting*. There is some evidence that admission avoidance schemes may provide a less costly alternative to hospital care.
Shepperd 2004	The impact of discharge planning on readmission rates, hospital length of stay, health outcomes and cost is *uncertain*.
Teasell 2003	Although *the majority of studies reported no statistically significant differences* in functional outcomes between the two groups, there was a reduction in hospital stays for patients receiving home-based therapy. These results suggest that patients with milder strokes who receive home-based therapies have similar functional outcomes to patients who receive traditional inpatient rehabilitation. There is strong evidence that high-level stroke patients discharged from an acute hospital unit can be rehabilitated in the community by an interdisciplinary stroke rehabilitation team without negative consequences. These patients attain similar functional outcomes compared to patients with equivalent stroke severity who receive inpatient rehabilitation. Community based programs also appear to reduce hospital length of stay, although we do not have evidence of an overall cost reduction. Although the effectiveness of early supported discharge programs for patients with moderate-to-severe deficits has not been well studied, limited evidence suggests that these patients are unsuitable candidates and should receive inpatient rehabilitation instead.

Effect of discharge interventions on discharge status

Length of stay was studied in nine reviews. The findings were inconclusive in four reviews [95,97,101,107], no significant differences were found in another four reviews [79,81,99,104] and one review [106] concludes that hospital length of stay was significantly shorter for ‘hospital-at-home’ interventions.

Discharge destination was studied in six reviews. Findings were inconclusive in one review [97] and no significant differences were found in four reviews [79,81,101,106], while one review [103] found a significant difference in the number of patients being discharged home when they were cared for at a stroke unit (based on three trials) but not when they were treated in hip units or geriatric units.

Dependency at discharge was studied in one review [101] and it was found, on the basis of two studies (one randomized and one non-randomized) that patients from the care pathway group were more dependent at discharge than the control group.

There is no evidence on the whole that discharge interventions have a positive impact at length of stay, discharge destination, or dependency at discharge.

Effect of discharge interventions on patient functioning after discharge

As was specified in the second research question, patient functioning after discharge was divided into four types: physical, emotional, social and health status. The effects of the discharge interventions are given for each of these, and subdivided according to the intervention classification scheme put forward by Parker et al. [81], in which there are four broad classes of discharge interventions: comprehensive discharge planning protocols, comprehensive geriatric assessment programmes, discharge support arrangements and educational interventions, all of which can be either generic or disease specific.

Effect of discharge interventions on physical status after discharge

The effect of interventions from the discharge planning category on physical status in the first 3 months after discharge was studied in three reviews [79,81,105]. Parker et al. [81] included RCT’s only and found eight articles representing seven studies in which discharge planning was studied. All studies involved patients who had experienced discharge from an acute inpatient hospital stay and evaluated a comprehensive discharge protocol

implemented by an individual who was either a specialist nurse, a social worker or an admitting clerk. The comprehensive discharge protocols were similar in design and were compared with usual discharge care. The protocols all had similar elements, including the assessment of patients, liaising with the patient's carer and other professionals to coordinate discharge and providing follow-up visits or telephone calls. Only two of the seven studies included in this part of the review considered outcomes related to physical function. No differences were found between experimental and control groups within 3 months after discharge. Richards and Coast [105] included five RCT's dealing with comprehensive discharge planning and came to the same conclusion as Parker et al. that no differences had been shown with regard to physical status. Shepperd et al. [79] included 11 RCT's, six of which presented data concerning physical status. Here too, no effects of discharge planning on physical status were found.
So, these three reviews discussing the impact of discharge planning on physical status after discharge are mutually consistent and all conclude that no effect of discharge planning has been demonstrated on physical status.

The effect of interventions from *the comprehensive geriatric assessment category* on physical status in the first 3 months after discharge was studied in three reviews on generic patient populations [81,97,105] and in one review on patients with femoral fractures [95]. Day and Rasmussen [97] conclude that measures of functional status were similar and showed no significant difference between the intervention and control groups. Parker et al. [81] point to the great variety of measures used to report physical function outcomes, making comparisons and pooling difficult. They say that the majority of studies appeared to have found no significant differences in the physical function outcomes of study patients and control patients over time. With regard to improvement in physical function over time, Parker et al. were able to calculate an odds-ratio over six studies and found a significant effect suggesting that the intervention was beneficial for physical functioning. These outcomes, however, were not measured within our stated timeframe of 3 months post discharge. Richards and Coast [105] included two studies in which functional status outcomes were measured within the 3 months after discharge and both found no differences. Finally, Cameron et al. [95] examined the effects of coordinated multidisciplinary inpatient rehabilitation by a geriatrician or rehabilitation physician compared with usual care for older patients with hip fracture, and they state that the available trials reviewed had a variety of aims, interventions and outcomes, making them difficult to combine. They conclude on the basis of nine trials that functional status did not improve consistently.

On the basis of these four reviews, therefore, it appears that comprehensive geriatric assessment has not been shown to have a positive impact on functional status within 3 months after discharge, in comparison with the control groups.

The effect of interventions from *the discharge support category* on physical status after discharge was studied in four generic [81,100,105,106] and two disease specific reviews [102,107], both in stroke patients. Hyde et al. [100] investigated the effects of supported discharge after an acute admission in older people with undifferentiated clinical problems, in which supported discharge was defined as actual additional support from any source provided to patients or their carers and commencing within one week of discharge following an acute admission. They included nine studies of which six provided data on functional status; however, there were no rigorous data on functional status that made pooled conclusions possible. Parker et al. [81] point to the wide range of types of intervention, varying from a single phone call after discharge to complex multidisciplinary interventions. They included twenty-eight controlled trials, nineteen of which reported on some aspect of physical functioning and eight of which were comparable enough to pool, but showed no significant effect on physical functioning. Richards and Coast [105] evaluated the effectiveness of organizational interventions that influence access to health and social care after discharge. They found considerable heterogeneity in the content of interventions and the selection of patient groups. They identified two trials that reported on functional status within 3 months of discharge, but both of these were inconclusive and did not suggest improvement. Shepperd et al. [106] assessed the effects of hospital-at-home compared with in-patient hospital care. Sixteen studies were included, eight of which measured functional status in elderly medical patients and two trials in patients following elective surgery. Although pooling was not possible, there were no indications that the functional status in the intervention groups was better at 3 months post discharge. The review of the Outpatient Service Trialists [102] considered interventions targeting stroke patients resident in the community setting. Fourteen trials were included, twelve of which involved patients who had experienced discharge from hospital; the trials included used a large number of heterogeneous outcome measures. It was found on the basis of twelve trials that patients who received therapy-based rehabilitation services after stroke were significantly more independent in personal activities of daily living than those patients who received no care or usual care. Most of the studies measured this outcome at 6 or 12 months after starting the therapy, however, and it is not clear how long this was after hospital discharge; no (pooled) data at 3 months post discharge are given in this review. Teasell et al. [107] studied the effectiveness of early supported discharge programs in stroke patients. Ten studies were included, eight of which reported some kind of functional outcome. None of these studies reported statistically significant differences between the treatment groups, indicating that functional outcome was not affected negatively or positively by the intervention. Pooling was not performed in this review.

On the basis of these six reviews, therefore, there are no indications that patients who receive supported discharge have a better physical status at 3 months after discharge than patients from the control groups.

The effect of *educational interventions* on physical status after discharge was covered by two reviews [81,105]. Parker et al. [81] studied if education interventions improved the outcome of discharge of elderly people from hospital; the interventions studied were described as mainly educational and could be limited to education or supplemented by other activities, such as home visits or telephone calls after discharge. Eleven studies were included, two of which contained data on physical status; one study found better results in the intervention group, but the other study found no effects. Richards et al. [105] studied discharge co-ordinator roles, which may incorporate educational interventions. Five studies were included, four of which contained data on physical status after discharge; none of these found significant differences between experimental and control groups.

On the basis of these two reviews, therefore, there are no clear indications that educational interventions have an effect on physical status after discharge.

Finally, Handol et al. [99] studied mobilisation strategies in hip fracture surgery patients. They conclude that there is insufficient evidence from randomized trials to determine the effectiveness of the various mobilization strategies.

In summary, we found no evidence base that discharge interventions have a positive impact on the physical status of patients after discharge. All the reviews included, however, had to contend with extensive heterogeneity in interventions, patient populations, and outcomes scales and times and with inadequate descriptions of control conditions, all of which made pooling difficult.

Effect of discharge interventions on emotional status after discharge

The effect of interventions from *the discharge planning category* on emotional status after discharge was studied in three reviews [79,81,105]. Parker et al. [81] found one discharge planning study that included emotional status outcomes, which stated that mean satisfaction scores changed little over time. Richards and Coast [105] included two studies that reported emotional function outcome within 3 months and both found no differences. Shepperd et al. [79] found two studies containing some kind of emotional function; one found some improvement on one parameter but not on two other emotional outcomes, while the second study failed to detect a difference.

On the basis of these three reviews, therefore, there are no indications that discharge planning affects emotional functioning after discharge.

The effect of interventions from *the comprehensive geriatric assessment category* on emotional status after discharge was covered by two reviews [81,105]. Parker et al. [81] found eight studies reporting on aspects of emotional status, only one of which reported a significantly greater improvement in cognitive scores in the intervention group than found in the controls. On the whole, however, the outcomes of intervention and control group patients were broadly similar, with no obvious benefit observable for patients undergoing comprehensive geriatric assessment. Richards and Coast [105] included three studies in which some emotional outcome was reported within 3 months after discharge, but none of the three found differences between intervention and control groups.

On the basis of these two reviews, therefore, there are no indications that comprehensive geriatric assessment has a positive impact on emotional status after discharge.

The effect of interventions from *the discharge support category* on emotional status after discharge was studied in four generic reviews

[81,96,105,106] and in one disease specific review [102]. Cole [96] found eleven trials reporting emotional status outcomes after geriatric post-discharge services, with the type of intervention and the type of emotional status outcomes varying from one study to the next. Emotional status outcomes included depression, morale, life satisfaction, contentment, emotional function, self perceived health or cognition. Three trials reported small effects and eight reported no effect. Parker et al. [81] found nine trials reporting on emotional functioning, including cognitive function (five trials) and measures of anxiety (three trials) or depression (two trials). They state that emotional status is measured in a variety of ways and in multiple domains, making interpretation or synthesis across studies problematic, and that in general, these measures remained unchanged between intervention and control groups. In addition, Parker et al. refer to sixteen trials measuring dimensions of quality of life, which may incorporate emotional status. Here too, they found many different instruments and that the data on the whole did not suggest that discharge support arrangements had a major impact on the quality of life of subjects when compared to controls. Finally, Parker et al. refer to six trials in which satisfaction was recorded. Four of the trials suggested some increased satisfaction with the service provided, but the data were neither consistently nor reliably reported. Richards and Coast [105] included two trials in this category; neither of which found differences in emotional status outcomes. To the extent that early discharge can be regarded as ‘discharge support’, Shepperd et al. [106] found eight trials involving medical patients in which some dimensions of psycho-social well-being or quality of life were measured. Six failed to detect a difference between intervention groups and control groups, while two studies reported more psycho-social dysfunction for the intervention group. Two trials involving surgery patients were included and failed to detect differences in this dimension. With regard to patient satisfaction, there was a mixed and ambivalent picture, but satisfaction tended to be higher in the hospital-at-home groups. No pooling was possible on these variables. The Outpatient Service Trialists [102] pooled results from five studies of quality of life in stroke patients and found no significant difference between experimental groups and control groups, which also applied to the findings of six studies in which mood/distress was measured.

On the basis of these five reviews, therefore, there are no indications that discharge support interventions enhance emotional functioning after discharge.

The effect of *educational interventions* on emotional status after discharge was covered by two reviews [81,105]. Parker et al. [81] found three studies of educational interventions that investigated the effect on emotional function; pooling was impossible and the effects were mixed: one study found no differences except for increased self-efficacy for walking; the second study had no measurements after discharge, and the third study, in which an education intervention in hospital was supported with extensive telephone follow-up after discharge, showed significantly lower levels of anxiety and a higher level of knowledge at 6 weeks after discharge. They also found four studies that considered the effect of educational interventions on adherence to medication advice, in which different measures were used to assess adherence, including tablet counts, self-reports of compliance and knowledge of medication regimens. All but one of these studies showed some improvements in adherence to medication or knowledge and it is concluded that more intensive interventions appear to be relatively effective, but that brief counselling or education is of little effect. Richards and Coast [105] studied discharge coordinator roles, which may incorporate educational interventions. Five studies were included, three of which contained data on emotional status after discharge, and none of these found significant differences between experimental groups and control groups.

On the basis of these two reviews, therefore, it appears that educational interventions might have some effect on aspects of emotional status after discharge, on knowledge and medication adherence, but the results of the reviews are not straightforward and the effects seem to depend on the dose and format of the educational interventions.

In summary, discharge interventions appear to have no effect, or only a very limited one, on the emotional status after discharge.

Effect of discharge interventions on social status after discharge

Data on the effect of interventions from the *comprehensive discharge planning category* on social status in first 3 months after discharge were found in one review [105]. Richard and Coast [105] included five studies with comprehensive discharge planning coordinators, and none found differences in social support experienced.

The effect of interventions from the *postdischarge support category* on social status was found in three reviews [81,103,106]. Parker G et al. [103] report about three trials in which there was no difference in patients at home at 3 months. Parker S et al. [81] found no statistical difference between experimental groups and control groups in number of patients being at home, based on six trials that measured this within first six months. On the basis of three trials, Shepperd et al. [106] found a significantly larger number of patients from the hospital-at-home group being at home at 6 weeks.

No reviews discussed effects of interventions from *geriatric assessment category* or of educational interventions on social status.

Finally, Handoll et al. [99] mention one small trial, in which no difference was found in loss of social independence between intensive physical training and placebo activities started post discharge.

In summary, there is a little bit of evidence, based on one review [106], that patients treated in hospital-at-home interventions more frequently remain at home than the control patients. The other four reviews, however, found no differences with regard to social status after discharge.

Effect of discharge interventions on health status after discharge

Mortality is certainly the outcome that has been looked at most frequently in the reviews, regardless the focus of the interventions. Most of the reviews (and the underlying trials), however, looked at mortality over more extended periods of time than the 3 months that are of interest in this meta review; mortality was mostly measured at 6 or 12 months. Twelve reviews [79,81,95,98-106] found no significant differences in mortality and only Day and Rasmussen [97] conclude that stroke units showed significant benefits in terms of mortality reduction, but do not specify the trials on which this conclusion is based.

The four reviews [95,97,99,106] in which *morbidity or complications* after discharge was studied and that were able to include trials, found no significant differences.

In summary, we found no firm evidence that discharge interventions have a positive impact on health status of patients after discharge.

Effect of discharge interventions on health care use after discharge and costs

Readmissions were measured in eleven reviews, but the measurement period was frequently 6 or 12 months and not the 3 months that is of interest for this meta-review.

Seven reviewers [79,95,97,100,102,103,105] are inconclusive about the effect of discharge interventions on readmission rates. One reviewer [106] found no statistically significant difference for patients in a hospital-at-home intervention. Three reviews [81,98,101] found a positive effect on readmissions. Parker et al. [81] reviewed four types of discharge interventions and conclude that when all interventions groups are taken together, the patients in the intervention groups have a significant lower risk of being readmitted and this was more marked among interventions provided both at hospital and at home. In the subgroups they did not find a significant difference for discharge planning activities, discharge support or geriatric assessment but they did find a significant difference in favour of patients receiving some kind of educational intervention. This is congruent with the positive finding of Gwadry et al. [98], that patients receiving a heart failure management program are less frequently readmitted. Finally, Kwan and Sandercock [101] found fewer readmissions for patients that were cared for in a stroke care pathway.

Three reviews [81,105,106] had included and discussed trials relating to the *use of services after discharge* and all were inconclusive on this subject.

All reviewers comment on the variety of ways that *costs,* cost-benefit and cost-effectiveness were measured in the trials, making synthesis difficult. Costs are also largely dependent on the organization of health care in an individual country, making cross-country synthesis difficult.

With this in mind, all reviewers [79,81,95,97,99,101,103,105-107] who report on costs are inconclusive about the impact of discharge interventions on costs.

In summary, there is little evidence that discharge interventions have an impact on health care use after discharge, or on costs, except that educational interventions may reduce readmissions in heart failure patients.

Effects of discharge interventions in specific patient groups.

Three reviews [101,102,107] focused on *stroke patients* and compared several care delivery models and rehabilitation services. The main aim of this group of studies was more on the post-discharge period than on the discharge itself. Kwan and Sandercock [101] conclude that stroke care pathways may be associated with positive and negative effects and that there is currently insufficient evidence to justify the implementation of care pathways for acute stroke management or stroke rehabilitation. The

Outpatient Service Trialists [102] conclude that therapy-based rehabilitation services targeting stroke patients living at home reduce the odds of a poor outcome and have a beneficial effect on a patient's ability to perform activities of daily living. They warn, however, that the evidence is derived from heterogeneous interventions and further exploration of the interventions is justifiable as a result. Teasell et al. [107] conclude that there is strong evidence that high-level stroke patients discharged from an acute hospital unit can be rehabilitated in the community by an interdisciplinary stroke rehabilitation team without negative consequences, and that community based programs also appear to reduce hospital length of stay.

Two reviews [95,99] concentrated on *patients with fractures*. Cameron et al. [95] state that the available RCT's had different aims, interventions and outcomes and were of poor to moderate quality, thus allowing only tentative conclusions. Combined outcome measures (e.g. death or institutional care) tended to be better for patients receiving coordinated inpatient rehabilitation, but the results were heterogeneous and not statistically significant. Handoll et al. [99] conclude that there is insufficient evidence to determine the effectiveness of the various mobilization strategies that start either in the early post-operative period or during the later rehabilitation period'.

Two reviews [98,104] concentrated on *cardiac patients*. Gwadry et al. [98] evaluated the effectiveness of multidisciplinary heart failure management programs on hospital readmission rates and found a significant decrease in these rates. Phillips et al. [104] also conclude that comprehensive discharge planning plus postdischarge support for older people with chronic heart failure significantly reduced readmission rates, and may improve health outcomes such as survival and quality of life without increasing costs. Based on above two reviews, it appears that readmissions in heart failure patients can be reduced by some kind of intervention.

7.4. Discussion

We found more than forty systematic reviews of discharge interventions, fifteen of which scored highly on methodological quality. Our conclusions on the basis of these fifteen reviews, is that there is only limited evidence for the positive impact of discharge interventions. We found a few indications that discharge interventions may be effective. Three reviews [81,104,105] state that effects are mainly observed when interventions from the discharge planning and discharge support side were combined across the hospital-home interface. In addition, two reviews [81,105], appear to show that educational interventions might have some effect on aspects of the emotional status after discharge, on knowledge and medication adherence.

The limited evidence about effectiveness of discharge interventions may be due to the heterogeneity of several aspects which review authors had to deal with. All review authors were confronted with heterogeneity in interventions, control conditions, patient populations, outcome definition, methods of outcome measurement, outcomes assessment times, and in other aspects. This heterogeneity made it difficult for the review authors to synthesize the results of the underlying trials and this mostly led to inconclusive conclusions.

It may be that discharge interventions do have an impact, but that measurements of outcomes are not reliable or not sensitive enough. There is also a possibility that discharge interventions do have an effect, but that this is not longstanding and can no longer be measured at the time of the outcome assessments. On the other hand, there is a possibility that effects of discharge interventions only show up after the three months after discharge to which we had limited the meta-review. There is no good theoretical base for either option, however, whether very short-term or very long-term. It may also be that patients in control conditions received more care than is suggested by the term ‘usual care’, which was mostly ill-defined. Another possibility is that discharge interventions are only working in specific subgroups of patients, or that discharge interventions are only effective in higher intensities.

On the other hand, we did find a few indications that discharge interventions may be effective. Three reviews [81,104,105] state that effects are seen in particular when interventions from the discharge planning and discharge support side were combined across the hospital-home interface. If discharge planning interventions are to be effective, they should have to be combined with discharge support interventions and vice versa. In addition, two reviews [81,105] appear to show that educational interventions might have some effect on parts of the emotional status after discharge, on knowledge and medication adherence, but the results of the reviews are not straightforward and effects appear to be dependent on the quantity and format of the educational interventions.

We also had one review [101], however, in which it was concluded that the effect of a discharge intervention was in the opposite direction to what had been expected, since they found that patients from the care pathway group were more dependent at discharge then the control group.

An interesting finding in this meta-review is that only a few trials were included in more than one review, although all included reviews had a related topic of research and all applied sensitive methods to find the primary research. It is possible that the final inclusion sets of each review differ due to different focuses of each review, what causes differences in search strategies and inclusion criteria. However, the question remains that, if a meta-review were to be done on the data from all of the 265 primary studies included in one of the reviews, whether this would lead to conclusions similar to those we have now obtained.

It could be argued that this meta-review does not give a complete picture of the state of art, because there are many more reviews on discharge interventions than were included in this review. Inclusion of reviews of a lower methodological quality would certainly have added some information, but these findings are less reliable in our opinion and would have led to more uncertainty. Moreover, we believe it gives cause for concern that we excluded more than half of the reviews found, solely on the basis of the suboptimal methodological quality of the systematic review.

It could also be argued that this meta-review is not up to date, since it was limited to reviews dated pre-2005. There may be more recent systematic reviews with conclusions different to those presented here. When a quick search for recent reviews was made in PUBMED and CINAHL in November 2006, however, and without a formal inclusion process applied, we found no indications that this would have altered our conclusions. There is a review, for example, that reaches firm conclusions that implementing a telemanagement program directed by an advanced practice nurse after hospital discharge decreases the costs and frequent rehospitalizations associated with heart failure and improves the patient's quality of life [108], but also a review that states that the evidence, as it stands at present, raises a number of issues about current hospital discharge policy [109], one that concludes that hospital-based case management did not reduce length of hospital stay or readmissions in adult inpatients [110], and another review that states that there was inconclusive evidence about the effects of telephone follow-up after discharge [111].

From a research point of view, many challenges remain in proving the (in)effectiveness of discharge interventions: better designs, better instruments, better descriptions of interventions and control conditions, and many more.

Challenges also remain for reviewers in applying strategies to find all available research data, but also in finding methods of synthesizing results containing a high degree of heterogeneity. Questions remain when reviews are comparable enough to allow synthesizing the results in the way it was done in this meta-review; maybe the umbrella concept of ‘discharge interventions’ is too broad to endeavour synthesizing by means of a review of systematic reviews already dealing with vast heterogeneity.

Finally, challenges remain for meta-reviewers in developing methods for synthesizing results of the relevant reviews available. The methodology for doing systematic reviews is well developed nowadays and well described for instance in the Cochrane handbook for reviewers, but a well founded methodology and rationale for performing a systematic review of reviews is currently lacking, especially with regard to the ways of synthesizing data. Such methodology is hardly needed due to rapidly growing amount of published reviews on a same or related topic. In this respect, we advise to follow closely the ongoing work of the recently started Cochrane Umbrella Reviews Working Group.

From a practical point of view, this meta-review is rather disappointing, since there is only limited evidence to give directions to how health care professionals and organisations can adopt discharge planning or discharge support interventions. Usual care seems to be equally as effective or ineffective as discharge interventions. Post-discharge problems continue to be an important issue, however, which means that professionals and organisations must consider ways of preventing, easing or solving post-discharge problems.

7.5. Conclusions

Based on fifteen high quality systematic reviews, there is some evidence that some interventions, particularly those with educational components and those which combine pre-discharge and post-discharge interventions, may have a positive impact but there is, on the whole, limited summarized evidence that discharge planning and discharge support interventions have a positive impact on patient status at hospital discharge, on patient functioning after discharge, or on health care use after discharge and costs.

Additional files:

Appendix 1: Data sources
Appendix 2: Search strategies
Appendix 3: Excluded studies and reason for exclusion
Appendix 4: List of references of primary studies included in one of the reviews

These additional files can be found at:
http://www.biomedcentral.com/1472-6963/7/47/

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Discussion and conclusions

Discussion and conclusions

This final chapter consists of a retrospection of the main findings of the performed research. It reflects on the strengths and limitations of the studies and the implications for practice. It contains discussion with regard to future research and ends with the final conclusions.

1. Main findings of the research

This thesis deals with the problems patients face when they are discharged to their homes from hospital and also discusses what can be done about it. It consist of 3 parts: (1) an initial literature review dating from 1995 (Chapter 1), (2) four empirical studies from the 90s (Chapters 2-5) and (3) two recent systematic literature reviews (Chapters 6-7).

For the study as a whole, the following research questions were formulated:

- **What kind of problems do patients encounter after discharge from hospital? And what factors influence these problems?**
- **Can patients with post discharge problems be identified at admission?**
- **What is the effectiveness of 'discharge interventions', with special attention to the effects of telephone-follow up?**

From the initial literature review (Part 1, Chapter 1) it was learned that patients encounter problems in several areas. Problems after discharge are influenced by personal characteristics of the patients such as age, gender, functional status at admission; health care characteristics such as the existence and quality of a discharge planning process; the extent to which and the way in which home care is provided; and the extent to which hospital and home care are inter-related.

After this initial literature review, four empirical studies were conducted (Part 2). In these we found that informational needs and difficulties with daily activities are the most prominent problems after discharge (Chapter 2). Moreover, we learned from a comparative study with elderly residing in their own homes, that the problems after discharge are not simply age-related (Chapter 3). The third empirical study showed that patients with problems at and after discharge can already be identified soon after admission with an easy-to- use short risk screening instrument (Chapter 4). The final empirical study concerned a randomized trial with a telephone follow-up in ophthalmic surgery patients (Chapter 5). In general, patients appreciated the calls but no differences in problems after discharge could be found between the experimental and control groups.

The inconclusive result of this intervention study formed the inspiration for Part 3 of this thesis. Here we performed a systematic analysis of all literature on the effects of telephone follow-up interventions in particular (Chapter 6) and hospital discharge interventions in general (Chapter 7).
The results from the first review showed that telephone follow-up has been applied in many patient groups but also that there was large heterogeneity in the way the intervention was performed. Some studies found a positive effect for the telephone follow-up, but on the whole no significant differences between intervention and control groups could be demonstrated. As far as pooling was possible, no firm conclusion could be drawn about the effectiveness of telephone follow-up. No study reported negative effects of the intervention.
The second review concerned a so-called meta-review, in which no primary trials, but only systematic reviews are studied. Fifteen high quality reviews on discharge interventions were identified. All of these faced considerable heterogeneity with regard to patients, interventions and outcomes – with the result that almost no review authors could perform statistical pooling. Only a few significant effects were found on some outcomes for some interventions. There was some evidence that educational interventions may have a positive effect, in particular if these are started before discharge and are continued thereafter. However, most review authors were not able to find firm evidence that discharge interventions are effective.

In conclusion, we found, both empirically and through literature studies, that hospital discharge and the period afterwards is problematic for patients and that discharge interventions are only to a limited extent effective.

2. The strengths and limitations of the performed research

The initial literature review in Part 1 provided a general picture of the problems patients have after hospital discharge and of the influencing factors.
The strengths of this review are that evidence was sought systematically; that both qualitative and quantitative studies were included; and that the results of both types of studies were integrated into a theoretical model following an inductive method of theory synthesis. Accordingly, the model has a sound empirical base.
However, the search performed in 1995 was not in keeping with today's stringent standards for a systematic review (Khan *et al.*, 2003; Higgins and Green, 2006). Although a sensitive search method had been used, this was limited to only two literature databases and to publications dating between 1990 and 1995. Therefore publications certainly were missed, but it is not certain that this made any difference to the framework. Another weakness was that the methodological quality of the included studies was not assessed (which is nowadays a requirement for a systematic review) and this was not taken into account in the conclusions. Also no quantification had been made of relationships between contributing factors and the several outcomes after discharge. Consequently, it was not possible to establish which factors could best be addressed in interventions.

The empirical research presented in Part 2 consisted of four studies.
The strength of this empirical part is the combination of a descriptive study of problems in discharged patients (Chapter 2), a comparative study in which the problems of discharged elderly patients were compared to those of home residing elderly (Chapter 3), a consecutive study in which the predictability of patients with problems after discharge was demonstrated (Chapter 4) and finally with a randomized clinical trial, in which an intervention with the aim to do something about the post-discharge problems was studied (Chapter 5).
Furthermore, prospective designs were applied as much as possible; and several instruments (self-developed and existing validated instruments) were used and cross-validated (Mistiaen and Evers, 1997; Mistiaen *et al.*, 1998; van der Meulen *et al.*, 1998; Duijnhouwer and Mistiaen, 1999). Also different measuring modes (interviews and questionnaires) were applied, and the outcomes were assessed at two measurement moments (at 7 and 30 days post discharge).

Our finding that it is possible to identify patients soon after admission that will have problems at and after discharge has also been demonstrated in several other studies (Dooper and Witteveen, 1995; Sager *et al.*, 1996b; Wensing, 1997; Wu *et al.*, 2000; Holland *et al.*, 2003; Cornette *et al.*, 2006; Engeln, 2006; Holland *et al.*, 2006) with the same and similar risk screening instruments.

However, a limitation was the lack of a base-line measurement before people were admitted to the hospital. Therefore, we were unable to compare scores after hospitalization with scores before it. Consequently, we could not conclude that problems after discharge were hospitalization-related or induced. The possibility exists that people already had several problems before hospital admission and kept these during the admission until after discharge. Or it could be that problems before admission were even worse than after discharge. But it may also be the case that people were admitted with fewer problems and got sicker in hospital. On the other hand the comparative study (Chapter 3) clearly showed that all recently discharged elderly have more problems than the non-hospitalized patients and it did show that these problems after discharge are not simply age-related. Also it is known from other studies with a pre-post design (Inouye *et al.*, 1993; Sager *et al.*, 1996b; Fortinsky *et al.*, 1999), that patients deteriorate during hospital admission and that problems after discharge are hospital-stay related.

Another limitation of our studies is that no recording was made of what happened to/with patients during their hospital stay. Also the intervention study was limited by the way the intervention could be controlled and by the extent to which we were sure that the intervention had been uniform.

After the empirical studies in Part 2, many certainties remained about people having problems after discharge, as well as uncertainties about the effect of a telephone intervention. These considerations led to Part 3.

Was it just a coincidence that we found no effect in our empirical study or could we share this with other researchers?

Accordingly, in Part 3 a worldwide systematic screening of the literature on discharge interventions was performed. First we looked at telephone follow-up in particular and second at discharge interventions in general.

A systematic review about the effectiveness of telephone follow-up (Chapter 6) was performed within the Cochrane Collaboration, ensuring high methodological quality of the review itself, and giving guarantees for a well-balanced analysis, synthesis and conclusions concerning the selected empirical studies. The overall conclusion of this review was that there is indeed no hard evidence that telephone follow-up is an effective intervention. However, this conclusion is based on primary studies with many methodological weaknesses and could also be due the extensive heterogeneity of many aspects in the included trials. Within the traditional Cochrane-approach used, qualitative information and (suggestive) evidence of effectiveness were not taken into account. Therefore the question remains: to what extent can the fact that patients appreciate telephone follow-up calls and consider this as helpful be regarded as evidence of effectiveness?. One might well ask whether an effect that cannot be measured in a hard quantitative way must be regarded as non-existent.

Following the systematic review of telephone follow-up, a meta-review of discharge interventions was performed (Chapter 7). The main conclusion of this meta-review was that there is only very limited evidence that discharge interventions are effective. An obstacle here was that a good evidence-based method to synthesize the results of reviews is lacking, especially with regard to weighing and synthesizing the evidence in a quantitative manner. Therefore tabular and descriptive methods had to be used. However, the strength of this study was the rigorous search for all available evidence, presented in systematic reviews of high methodological quality. In addition, the conclusion indicating very limited evidence about the effectiveness of discharge interventions is supported by another meta-review on this topic (Kumar and Grimmer-Somers, 2007), that was published almost simultaneously with ours.

Despite the limitations of the empirical research we performed, the results obtained are in line with the research carried out by others, as was found in the systematic reviews. Both results about problems after discharge are confirmed by other similar studies and the no-effect from our clinical trial is not exceptional as was demonstrated in the two systematic reviews about discharge interventions.

3. Implications of the results for practice

A major finding from this thesis is that problems after discharge were proven to exist in many empirical studies, over an extended period of time, and in the Netherlands and across the (western) world. This means that health care professionals and institutions can be sure that discharge is a problematic issue that deserves their attention.

Moreover, it was demonstrated that the problems after discharge relate to many aspects of the life of patients. The main findings in this respect were that patients feel insufficiently informed, but also that patients have problems with their daily personal and household activities; they have pain, are tired and have other symptoms causing distress; their social functioning is impaired and they have trouble in emotional functioning; and they do not always have as much support or help as they need or want.

From this it can be learned that every attempt to alleviate these problems is welcome.

With regard to possible interventions, an interesting finding from the meta-review was that it appeared that interventions combining pre-discharge and post-discharge elements showed more effects than pre- or post-discharge interventions only.

Another useful finding for practice in this thesis is that professionals can rely on several easy to use instruments to find and predict soon after admission those patients with a high risk for post discharge problems.

This enables hospitals and health professionals to be alert to the needs of these patients and to make an extra effort in preparing these patients and their carers for the post-discharge period. It must be possible to incorporate some kind of risk screening for post-discharge problems into the regular intake procedure when a patient is admitted to the hospital.

And although we found only limited evidence concerning the effectiveness of discharge interventions, it has to be kept in mind that ‘no evidence of effect’ does not mean ‘evidence of no effect’. Indeed we have not found strong evidence that discharge interventions are effective, but it was also not proven they are not effective and, more importantly, we have not found any evidence that they are counter-productive or harmful.

The research on this matter has been shown to have several weaknesses, such as poor design, unclear descriptions of intervention and control conditions and of the contrast between them, unclear terminology, psychometrically weak or insensitive outcome instruments and a lack of good theoretical frameworks.

On the other hand it became clear that we can measure problems after discharge and prove their existence; we can identify patients at risk in an early stage; we know determining and contributing factors of post-discharge problems; and there is a complete armoury of intervention options.

‘In dubio abstine’, or ‘if in doubt, don’t act’ is mostly a good health care adage. When there is doubt if an intervention does good, you better don’t do it. But it remains questionable whether this also applies with regard to post-discharge problems; therefore we would like to make a plea for ‘if in doubt, act’.

As in the case of many other nursing problems and interventions there is no solid evidence basis, but this does not justify no action. There is also the issue of common sense that nurses and other health care professionals can apply in considering these problems.

Therefore we think it is worthwhile for health care professionals to takee a close look at the many intervention options described in the literature and find those elements that have a plausible effect for the relevant patient(category). One can try one or more of these elements and evaluate the effect in the usual systematic (nursing) care process.

For instance, we believe it does not require excessive effort to make a call to a patient after discharge, when we know that patients appreciate this and consider it helpful.

Of course, we want to stress that when professionals apply discharge interventions, they should follow this by a rigid evaluation of the outcomes and preferably publish a report about it, because of the many existing uncertainties in the scientific cause-effect framework.

Another interesting point for discussion is: Do the problems after discharge have to be hospital-related or hospital-induced before there are grounds to act? Or before one can say it is the responsibility for the hospital personnel to act?

A number of studies (Fortinsky *et al.*, 1999; Covinsky *et al.*, 2000; Covinsky *et al.*, 2003; Boyd *et al.*, 2005) have shown that there is an effect of hospitalization on problems after discharge. Other studies (Inouye *et al.*, 1993; Sager *et al.*, 1996a; ten Hulscher, 2002; de Jonge *et al.*, 2003; Hoogerduijn *et al.*, 2007), have demonstrated that many patients undergo a functional decline during hospitalization and that these patients can be identified soon after admission, using almost the same factors that predict patients with postdischarge problems.

It is not merely the case that more disabled patients are more frequently hospitalized and therefore have more problems after discharge. On the contrary, the status after discharge is influenced by the hospital stay itself, and can be seen as iatrogenic, making the hospital and its professionals also responsible for the problems after discharge.

Therefore we believe that post-discharge problems constitute an area of responsibility that lies with hospital-based professionals – ideally in cooperation with home health care professionals.

4. Lessons learned and directions for future research

In this section a number of methodology considerations are put forward: firstly, concerning primary research in (interventions for) post discharge problems, secondly about systematic reviews of socially complex interventions and finally about conducting meta-reviews.

Discharge interventions as socially complex interventions

The discharge interventions we encountered in some phase of this thesis all consisted of several components: an intervention (sometimes single, sometimes multiple), a individual (mostly more than one) who executes the intervention, a individual (inherently many different patients) who receives the intervention, a context in which the person who gives the intervention is functioning, an environment in which the person who is receiving the intervention is functioning and a region or country in which the intervention takes place.

Some of these components, but certainly not all, can be standardized, causing inevitable and uncontrollable bias when subjected to analysis. This applies also for the condition to which the experimental intervention is compared. For example, one can highly structure an intervention like telephone follow-up by making an exact scheme of what questions have to

be asked, at what time the call has to be made, etc., but a telephone follow-up still remains an interaction between two persons that can not be standardized one hundred percent: the caller may be tired or have an unclear voice; the person called may be depressed or have a hearing impairment; the telephone line may be clear or not; there can be a lot of surrounding noise, etc… All these variables can affect the ‘highly standardized’ intervention.
Or to take another example: a discharge planning coordinator can do many things to arrange post discharge requirements as efficiently as possible but is always dependent on the available services and the quality of these to make the process effective.

Each discharge intervention has several active ingredients, but possibly also several neutralizing ingredients. Therefore discharge interventions can be regarded as complex interventions. These were defined by the English Medical Research Council (MRC) as ‘interventions that are built from a number of components, which may act both independently and inter-dependently’ (Campbell *et al.*, 2000; Medical Research Council, 2000).

The diversity and complexity of each discharge intervention causes bias when its effectiveness is assessed.
This could be a main reason why most RCTs examining discharge interventions end up inconclusively or show conflicting results. It would help if studies not only present what the aimed intervention optimally should have been, but if the authors also observe and describe the variety in the given experimental intervention and take that variety into account in their analyses.
As already stated, this diversity in several aspects applies also to the control condition, which in many studies was ‘usual care’ and was generally not described at all. This resulted in unsatisfactory and unclear knowledge about the contrast between experimental and control conditions.

Therefore we want to make a plea for more concise, comprehensive and extended research designs and reports.
We propose that at least, each trial on a socially complex intervention should not only measure outcomes, but should also measure the intensity and the extent to which the intervention has in fact been given, and that the results of these measurements should be presented in a paper. This requires additional effort from the researchers since they not only have to develop or find

instruments to measure the outcomes, but also to measure the intervention dose and characteristics. More extensive description and measurement of the interventions and of the major influencing factors would enhance transferability and replicability of complex interventions in other studies and other surroundings. This plea has already been made by several other authors (Francke, 1996; Campbell *et al.*, 2000; Medical Research Council, 2000; Wolff, 2001; Lindsay, 2004; van Meijel *et al.*, 2004; Blackwood, 2006; Oakley *et al.*, 2006).

However, we realize that many factors are hard to measure, and it is also hard to judge the possible influence they may have on the intervention content, process and outcomes.

In order to arrive at well balanced research of socially complex intervention, the English Medical Research Council made a comparison between drugs research and research of socially complex interventions (Campbell *et al.*, 2000; Medical Research Council, 2000). Each new drug follows a sequence of experimental laboratory research, animal tests and phase 1 through 4 studies in humans before it can be put on the market.

However, socially complex interventions are frequently developed without all these preceding phases and are tested immediately in randomised trials, often with inconclusive results. Therefore we call for a stepwise approach by adding more preceding phases and research for all complex interventions, comparable to the phases in drug research.

Ideally, the interventions should be split up into several components that are introduced sequentially and subjected to stepwise analysis, so that it would be much easier to recognize the active ingredients and the ideal mix of these ingredients.

Greater attention is required for the application of randomized block designs and factorial designs in nursing research, by which it will be easier to distinguish main and interactional effects (Campbell *et al.*, 2000; Eccles *et al.*, 2003; Collins *et al.*, 2005).

The research on discharge interventions is hampered not only by the way the intervention and control conditions show variety and lack of clarity, but also by the way the outcomes are measured. We have seen that studies use a diversity of outcomes that are ill defined, poorly measured and inconsistent in timing.

For example, we have found that after discharge people feel uncertain. But what exactly does ‘feeling uncertain’ mean; how can it be measured in a valid and reliable way; and how much can a discharge intervention be expected to affect this outcome?

And how should we interpret the fact that patients say they feel reassured by the intervention but this does not show on an uncertainty instrument or there is no difference shown between experimental and control groups? Are the patients wrong when they say they feel reassured? Or are the instruments not good enough? Or is the effect shadowed by unknown or unmeasured contextual variables?

More research is needed to establish which outcomes can be influenced by discharge interventions; to determine the way the mechanisms work; and how the relevant outcomes can best be measured.

We believe that research funds have to invest not only in practical clinical trials but also in more fundamental research of theory and instrument development.

Systematic reviews of socially complex interventions

The diversity in complex interventions causing inconclusiveness in single randomised trials has been discussed above.

Consequently, it is not surprising that systematic reviews which try to synthesize these primary studies also arrive at mainly inconclusive results. Summing up bias generally results in even more bias, unless the primary studies give insight in the complexity and diversity, allowing reviewers to conduct subgroup and sensitivity analyses.

A characteristic of many systematic reviews is that they only include RCTs in order to answer the question of effectiveness. As argued before, however, many RCTs are too weakly designed to be able to find effects of socially complex interventions, with the result that the reviews almost inevitably end inconclusively.

If systematic reviews were also to include and synthesize results of other research designs, e.g. all kinds of non-randomized, non-controlled or qualitative research, perhaps the straightforward conclusions of ‘no evidence of effectiveness’ could be nuanced by these other studies following other designs. This might produce more useful information to professionals in the field and researchers as to whether the intervention might be of value or not.

Therefore, we advocate that systematic reviews of complex interventions should not only focus on quantitative research but also on qualitative research approaches.

Including other research types in systematic reviews would give a more complete picture of the possible effectiveness of an intervention, especially concerning how patients perceive the intervention and how nurses/professionals experience it, including any difficulties they had with performing the interventions. Such reviews would yield more pointers and recommendations for practice.

However, the methodology required to combine and synthesize results across different research designs is still in its infancy. Even the methodology for synthesizing results from purely qualitative research or the results of observational studies only, is still young. Accordingly, it is to be expected that the methodology needed to combine results across designs will take some time to develop.

Meta-reviews of systematic reviews of complex interventions

The problem of systematic reviews summarizing bias or missing potentially relevant evidence, as pointed out above, is exacerbated once again in a review of reviews.

Meta-reviewers are faced with doubly accumulated bias, which almost inherently must lead to inconclusiveness.

This methodology, too, for performing meta-reviews is still in its infancy. There are methods for the search part and for the methodological assessment of systematic reviews, but there is no well-grounded method to determine which reviews to include, e.g. whether to limit the review to high-quality reviews only, nor is there a method for synthesizing the results of systematic reviews.

Therefore most meta-reviews rely on tabular and vote-counting methods that are a major point of discussion in systematic reviews.

Another important issue that meta-reviewers face is the problem that the included reviews on one topic frequently contain different primary studies and have only a limited overlap.

It would be interesting to study whether meta-reviews based on conclusions from reviewers come to the same conclusion as a review based on all primary studies that were included in one of the reviews.

No one states how to deal with the problem of the different inclusion criteria or with inclusion results from the different reviews.

In fact, today's meta-reviews do have some resemblance to old narrative reviews of field experts, with all their drawbacks. It might therefore be questioned whether meta-reviews currently make any positive contribution at all to such complex matters, apart from providing an overview of the research and reviews that have been completed on the subject, but certainly not to give the ultimate answer.

A number of years ago professionals faced the problem of attaining an overview of the enormous number of (conflicting) primary trials. This was solved by the introduction of systematic reviews. Now, professionals are confronted with the problem of attaining an overview of a growing number of (conflicting) systematic reviews. Therefore, the need to synthesize reviews is growing fast and we believe that much more energy has to be invested in developing methodologies for meta-reviews.

5. Conclusions

Based on all the material in this thesis, following conclusions can be drawn:

With regard to practice:

- Problems after discharge do exist; informational needs and problems in daily activities are the most prominent.
- Patients with (a high risk for) problems after discharge can be identified early after admission; hereto several easy-to-use instruments exist.
- Telephone follow-up of patients after discharge does not show any measurable favourable effect, although patients may experience it as helpful.
- Discharge interventions are only shown to be effective to a limited extent.
- There is some evidence that some interventions may have a positive impact; particularly those with educational components and those that combine pre-discharge and post-discharge interventions.

With regard to future research:

- Primary research on discharge interventions shows several methodological weaknesses. More and better-designed primary trials, that follow a stepwise approach, are needed.
- Several easy-to-use instruments exist to identify early after admission patients with problems after discharge.
- There are many challenges to improve the quality and practical relevance of systematic reviews on discharge interventions. In particular, methodology has to be developed to combine quantitative and qualitative research in one review.
- Meta-reviews of systematic reviews are still lacking a solid method, especially with regard to the synthesis of the underlying reviews.

Although this thesis provides some answers, it may possibly raise even more questions. Expressed in another way, this thesis raises many challenges for both health care professionals and researchers. It is hoped this thesis provides sufficient stimuli and pointers for others to take on the challenges, so that the quotes with which the thesis started will not be repeated again in the future.

Patients are discharged, but professionals and researchers are not dismissed.

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Summary

Summary

The thesis consists of three main parts, in addition to an introduction and a final discussion chapter.

In the general introduction some trends are discussed that explain the importance of this study. Hospital stays have become much shorter in recent decades. As a result there is less time available to prepare patients adequately for discharge and the post-discharge period. A second trend is the fact that elderly are increasingly the largest group of people admitted to hospital. An initial Dutch health care reform led to a sharp divide between primary and secondary care. As a reaction many other reforms followed, as well as a variety of projects designed to smoothen the transition from hospital to home.
The following research questions have been formulated for this study:
What kind of problems do patients encounter after discharge from hospital? And what factors influence these problems?
Can patients with post-discharge problems be identified at admission?
What is the effectiveness of ‘discharge interventions’, with special attention to the effects of telephone-follow up?

The first part concerns an explorative literature review of the problems that patients experience after discharge from hospital and the factors that influence this. This study resulted in the development of a theoretical framework. To this end, a two-step theory synthesis method was used. Firstly qualitative research articles were studied, and from these, problems and influencing factors were extracted. These variables were then verified and the results from quantitative studies were added.
The main problem areas after discharge appear to be a decreased functional status and poorer health. These problems are influenced by both patient and care related factors. Some intervention studies showed a positive effect of discharge planning interventions, but on the whole, there was a great lack of empirical and well-controlled research.

The second part of this thesis consists of four empirical studies. Chapter 2 presents the results of an empirical study on 145 elderly, discharged to their homes from eight different nursing wards of a university hospital in Amsterdam. The problems after discharge were measured at day 7 post

discharge; for half of the patients this was done by postal questionnaire and for the other half by face-to-face structured interviews. In this study a self-developed and validated questionnaire (the problems- after-discharge questionnaire) was used together with other already existing and valid instruments.
The most frequent problem was that 80% of the patients felt insufficiently well informed.
In addition, three quarters had problems relating to personal care or to functional activities of daily life. Almost 90% of the patients had one or more physical complaints such as feeling tired, lack of stability when standing or pain. Although most patients received support in the problem areas, there were still 40% that would have liked additional help.

Since it was not clear from the study described in Chapter 2 if the problems found could be attributed to the hospitalization or if they were solely related to the age of the patients, a comparison was made with a representative sample of elderly who were not recently admitted to a hospital. This study is described in Chapter 3. The results indicate poorer functional status, emotional status, general health and social functioning for the recently discharged elderly. They also received more help or support in all areas concerned and had a greater wish for (additional) help or support. Furthermore, when only the non-hospitalised elderly with an illness were compared to the discharged group, the differences remained, albeit to a somewhat reduced extent. These differences were found with all three applied instruments.

Chapter 4 describes an empirical study of 503 elderly patients that were admitted to one of nine nursing wards in two hospitals in Amsterdam. The objective of this study was to test the predictive validity of the BRASS-index in screening patients with post-discharge problems. The BRASS-index contains ten items and is applied by a nurse soon after admission. Problems after discharge were measured at day 7 and day 30 after discharge with the problems-after-discharge questionnaire, the Nottingham Health Profile and the Coop/Wonca charts. The results showed that patients with high values on the BRASS-index often had a discharge destination other than their home. Furthermore, significant relationships were found between the scores on the BRASS-index and the post-discharge problems scores, both at day 7 and day 30. The BRASS-index had good specificity but relatively low sensitivity.

Subsequently, a randomized intervention study was performed, which is the subject of Chapter 5.
Since it was found in the former descriptive studies that feeling insufficiently well informed was a main problem, we considered a telephone follow-up to be a feasible and appropriate intervention. A nurse from the hospital ward performed this a few days after discharge. The research population consisted of 394 ophthalmic surgery patients, that had been admitted for at least 3 days to the ophthalmic ward of an Amsterdam university hospital.
Patients from the experimental group were called between the third and sixth day after discharge by a nurse, who used a structured protocol. Patients were asked how they felt and if they had any problem. Outcomes were gathered by a postal questionnaire on day 7 and day 30 after discharge. To this end, the problems-after-discharge questionnaire was used along with translated versions of the Patient Learning Need Scale and the Mishel Uncertainty in Illness Scale. Patients from the intervention group were also asked how they experienced the telephone call. No differences were found in any of the outcomes. However, patients from the experimental group stated that they appreciated the call and would recommend this in the case of another hospital admission.

Part 3 concerns two systematic literature reviews.
Triggered by the no-effect we found in the telephone follow-up study, described in Chapter 5, it was decided to conduct a comprehensive literature study of other telephone follow-up trials. This systematic review is described in Chapter 6. The review was performed within the Cochrane Consumers and Communication Group. Thirty-three relevant studies were identified. However most had a high risk of bias. The results showed that telephone follow-up has been applied in many patient groups but also that there was considerable heterogeneity in the way the intervention was performed. Many different outcomes were measured. Some studies found a positive effect for the telephone follow-up, but on the whole no significant differences between intervention and control groups could be demonstrated.
As far as pooling was possible, no firm conclusion could be drawn about the effectiveness of telephone follow-up. No study reported negative effects of the intervention.

Because no effect was found in the review about telephone follow-up, another review was performed in which we looked at all kinds of discharge interventions. This literature review is described in Chapter 7. This review, a so-called meta-review, did not include primary trials, but only systematic reviews. Fifteen high quality reviews were identified. All of these faced considerable heterogeneity with regard to patients, interventions and outcomes, with the result that almost no review authors could perform statistical pooling. Only a few significant effects were found on some outcomes for a few interventions. There was some evidence that educational interventions may have a positive effect, in particular if these are started before discharge and are continued afterwards. However, most review authors were not able to find firm evidence that discharge interventions are effective.

The final chapter of the thesis starts with a retrospective look at the strengths and limitations of the performed studies. Then there is discussion on why many nursing intervention studies do not reach firm conclusions. A plea is made for more rigorous methods to study this kind of socially complex intervention. In addition, the implications of the performed studies for practice are discussed. It is argued that, despite the absence of firm evidence, nurses and other health care personnel do have enough instruments and intervention options at their disposal to prepare patients better for discharge and to ease problems after hospitalization.

Samenvatting

Samenvatting

Het proefschrift bestaat uit drie delen naast een inleiding en een afsluitend beschouwend hoofdstuk.

In de algemene inleiding wordt een aantal tendensen besproken waarom de onderhavige studie belangrijk is. Ziekenhuisopnames zijn in de afgelopen decennia sterk verkort, waardoor er steeds minder tijd is om de patiënten adequaat op het ontslag en de periode erna voor te bereiden. Ouderen vormen steeds meer de grootste groep mensen die in het ziekenhuis wordt opgenomen. Veranderingen in de Nederlandse gezondheidszorgorganisatie zorgden aanvankelijk voor een grote afstand tussen eerste en tweede lijn. Als reactie hierop volgden een reeks van hervormingen en tal van initiatieven om de overgang tussen ziekenhuis en thuis makkelijker te maken.
De hoofdvragen voor dit proefschrift zijn:

- Welke problemen ervaren patiënten thuis na ontslag uit het ziekenhuis? En welke factoren zijn hierop van invloed?
- Kunnen patiënten met problemen na ontslag reeds bij opname in het ziekenhuis geïdentificeerd worden?
- Wat is het effect van interventies die gericht zijn om de problemen na ontslag te voorkomen of te verminderen, en in het bijzonder wat is het effect van een telefonische follow-up?

Het eerste deel betreft een explorerende literatuurstudie naar de problemen die patiënten ondervinden na ontslag uit het ziekenhuis en wat daarop van invloed is. Op basis hiervan is een theoretisch model gemaakt van postontslagproblemen en beïnvloedende factoren.
Hierbij zijn eerst kwalitatieve studies van problemen na ontslag bestudeerd, waaruit de belangrijkste variabelen zijn geëxtraheerd. Daarna zijn deze variabelen geverifieerd en uitgebreid aan de hand van kwantitatieve studies. De belangrijkste problemen na ontslag bleken een verminderd functioneren te zijn op het gebied van het dagelijks leven en een verminderde gezondheidstoestand. Deze problemen worden beïnvloed door kenmerken van patiënten en van de zorg(organisatie). Sommige interventiestudies toonden een gunstige invloed van ontslagvoorbereidende interventies, maar er bleek een groot gebrek te zijn aan goed gecontroleerde onderzoeken.

Het tweede deel van het proefschrift betreft vier empirische studies. In het tweede hoofdstuk worden de resultaten besproken van een empirische studie onder 145 ouderen die naar huis zijn ontslagen vanaf acht verschillende verpleegafdelingen van een academisch ziekenhuis in Amsterdam. De problemen na ontslag werden geïnventariseerd op zeven dagen na ontslag; voor de helft van de patiënten via een schriftelijke enquête en bij de andere helft via een gestructureerd interview bij de patiënten thuis. Bij dit onderzoek werd een zelf ontwikkelde en gevalideerde vragenlijst (de postontslagproblemenlijst) gebruikt in combinatie met reeds bestaande meetinstrumenten. Tachtig procent van de patiënten voelde zich onvoldoende geïnformeerd. Ook had driekwart van de patiënten problemen met huishoudelijke activiteiten en /of persoonlijke verzorging. Bijna 90% van de patiënten had één of meerdere klachten van fysieke aard, zoals moeheid, onzeker op de benen staan of pijn. En hoewel de meeste patiënten hulp of ondersteuning kregen op de gebieden waar ze moeite ondervonden, had 40% van de patiënten graag nog aanvullende hulp ontvangen.

Omdat uit de studie in hoofdstuk twee niet duidelijk werd of de gevonden problemen na ontslag te maken hebben met de ziekenhuisopname of slechts met de leeftijd van de patiënten, zijn die resultaten vergeleken met een studie onder ouderen die niet uit het ziekenhuis waren ontslagen. Deze studie is het onderwerp van hoofdstuk drie. Het bleek dat mensen die recent in het ziekenhuis waren opgenomen een slechtere functionele, emotionele en gezondheidsstatus hadden dan de vergelijkingsgroep. Ook ontvingen de ontslagen ouderen op alle onderscheiden gebieden meer hulp of ondersteuning en hadden zij een grotere wens tot aanvullende hulp of ondersteuning. Deze verschillen waren ook te zien bij een vergelijking tussen de ontslagen ouderen met ouderen die een ziekte hadden maar niet recentelijk waren opgenomen. Dit beeld werd gevonden met alle drie de meetinstrumenten die werden gebruikt.

Hoofdstuk vier beschrijft een empirische studie onder 503 ouderen opgenomen op negen verschillende verpleegafdelingen van twee Amsterdamse ziekenhuizen. Het doel van de studie was na te gaan of aan de hand van de BRASS-index, die afgenomen werd kort na opname, die mensen te identificeren die na ontslag veel problemen ervaren. De BRASS-index is een instrument die tien kenmerken van patiënten meet en afgenomen wordt door een verpleegkundige. De problemen na ontslag werden gemeten zeven en dertig dagen na ontslag met de postontslagproblemenlijst, de

Nottingham Health Profile en de Coop/Wonca kaarten. Uit de resultaten bleek dat mensen met hoge waardes op de BRASS-index vaak niet naar huis ontslagen werden. Ook bleken er significante verbanden te bestaan tussen de waarden op de BRASS-index en de waarden op de uitkomstvariabelen zowel op zeven als op dertig dagen na ontslag. De BRASS-index had een goede specificiteit, maar een relatief lage sensitiviteit.

Vervolgens is een gerandomiseerde interventiestudie opgezet, die beschreven wordt in hoofdstuk vijf. Omdat uit de eerste studies bleek dat zich onvoldoende geïnformeerd voelen een veel voorkomend probleem was, werd gekozen om een telefonische follow-up door een verpleegkundige van het ziekenhuis enkele dagen na ontslag uit te voeren. De studie werd uitgevoerd bij 394 patiënten die waren opgenomen op de oogheelkunde-afdeling van een Amsterdams academisch ziekenhuis en daar minstens drie dagen bleven. Bij de patiënten die werden gerandomiseerd in de interventiegroep, belde een verpleegkundige van de afdeling naar de patiënt tussen de derde en zesde dag na ontslag aan de hand van een belprotocol. Aan de patiënten werd onder andere gevraagd hoe het met ze ging, of ze nog vragen hadden en welke problemen of klachten ze ervoeren. De uitkomsten werden gemeten via een schriftelijke enquête, die zeven en dertig dagen na ontslag werd opgestuurd, met daarin opgenomen de postontslag-problemenlijst, en vertaalde versies van de Patient Learning Need Scale en de Mishel Uncertainty in Illness Scale. Bij de patiënten uit de interventiegroep werd tevens gevraagd hoe ze de telefonische follow-up hadden ervaren. Op geen van de uitkomstmaten, noch op zeven noch op dertig dagen na ontslag, werd een verschil gevonden tussen de interventie- en de controlegroep. Maar de patiënten uit de interventiegroep hadden het telefoontje wel gewaardeerd en zouden dat bij een eventuele volgende opname graag opnieuw willen.

Het derde deel betreft twee systematische literatuurstudies.
Getriggerd door het niet gevonden effect van de telefonische follow-up in de studie uit hoofdstuk 5, is de internationale literatuur grondig bestudeerd om te kijken hoe een telefonische follow-up in andere studies had uitgepakt. Deze systematische review wordt beschreven in hoofdstuk zes. De review werd uitgevoerd binnen de kaders van de Cochrane Consumers and Communication Group. Er werden 33 relevante studies geïdentificeerd, maar die waren bijna allemaal van lage methodologische kwaliteit. Het bleek dat

telefonische follow-up werd toegepast in vele patiëntengroepen, en dat er een groot verschil was in de manier waarop deze follow-up werd uitgevoerd. Er waren studies die de telefonische follow-up effectief vonden, maar over het algemeen werden geen significante verschillen gevonden tussen de interventie- en de controlegroepen. Voor zover poolen van de resultaten van de studies mogelijk was, konden we geen harde conclusies trekken over de effectiviteit van telefonische follow-ups. Geen van de studies rapporteerde nadelige effecten van de interventie.

Mede omdat in de systematische review geen effect gevonden werd, is tien jaar na de eerste review uit het eerste hoofdstuk, gekeken in de internationale literatuur naar alle onderzochte interventies om problemen na ontslag te voorkomen en/of te behandelen. Deze literatuurstudie wordt beschreven in hoofdstuk zeven. Als methode is gekozen voor een systematische meta-review, dit wil zeggen een literatuurstudie waarbij reeds bestaande systematische reviews worden geanalyseerd. We vonden vijftien relevante reviews, die methodologisch goed waren uitgevoerd. Alle geïncludeerde reviews hadden te maken met aanzienlijke heterogeniteit in interventies, onderzoekspopulaties en uitkomstmaten, waardoor nauwelijks resultaten van de primaire studies gepoold konden worden. Incidenteel werd een significant effect gevonden op een bepaalde uitkomst voor een bepaalde interventie. Er was enige evidentie dat educatieve interventies een gunstig effect hebben en vooral als die ingezet worden voor ontslag en na ontslag worden gecontinueerd. Maar overwegend konden de auteurs van de reviews geen duidelijke conclusies trekken dat de bestudeerde ‘ontslaginterventies’ effectief waren.

Het proefschrift eindigt met een terugblik op de uitgevoerde studies: wat daarin sterke punten waren, maar ook wat verbeterd kon worden. Daarna wordt een verklaring gezocht waarom veel studies van verpleegkundige interventies niet tot een definitieve conclusie komen. Er wordt gepleit voor een uitgebreidere methodologische aanpak van dergelijke ‘sociaal-complexe’ interventies. Ook wordt ingegaan op de betekenis van dit proefschrift voor de praktijk. Er wordt betoogd dat ondanks het ontbreken van stevige wetenschappelijke onderbouwing, verpleegkundigen en ander gezondheidszorgpersoneel een uitgebreid instrumentarium hebben om het ontslag van patiënten goed voor te bereiden en de eventuele postontslag-problemen te behandelen.

Dankwoord

Namen noemen is namen vergeten.
Vooràl bedanken is ook minder bedanken.
Bijdragen waren soms duidelijk aanwijsbaar,
soms onzichtbaar maar niettemin zeer ondersteunend.
Daarom dank ik allen die op enigerlei wijze het tot stand komen van dit
proefschrift mogelijk hebben gemaakt.

About the author

Patriek Mistiaen was born in 1957 in Izegem (Belgium); he obtained his nursing degree in 1978 at the St.-Jans Instituut voor Verpleegkunde in Brugge (B).
He obtained several additional diplomas, such as an educational degree in 1979 (Brugge, B), infection control nurse in 1980 (Brussel, B), his USA Registered Nurse license in 1984 (Indianapolis, USA), a diploma for professional innovation in nursing (VO-B) in 1988 (Leusden) and his masters degree in nursing science in 1991 (Maastricht).
In 1979 he moved to the Netherlands, where he started working as a nurse at the Bone Marrow Tranplant Unit of the Leiden University Medical Center, what he continued until 1992, with a short break to help starting up a bone marrow transplant unit in Indianapolis (USA).
He worked several years as a teacher for the Hogeschool Rotterdam and the Hogeschool Inholland where he taught research methods at student nurses and student masters in advanced nursing practice.
His research experience started in 1986. He worked as researcher for the Leiden University Medical Center, the Dutch Health Council, the VU University Medical Center, and he is currently working at the NIVEL in Utrecht. In these places he researched many different subjects as among others transitional care, thirst in hemodialysis, intertrigo, palliative care organisation; systematic literature reviews and nursing guidelines. Currently he is involved in a cost-effectiveness analysis of the Australian Medical Sheepskin in the prevention of pressure ulcers in nursing homes clients.

Stellingen

bij het proefschrift 'Hospital discharge: problems and interventions'
van Patriek Mistiaen

1. Discharged is not the same as dismissed.

2. Patiënten waarderen een telefoontje vanuit het ziekenhuis na ontslag. Zolang niet bewezen is dat dergelijke telefonische follow-up niet effectief is, verdient deze interventie het voordeel van de twijfel. (dit proefschrift)

3. Er zijn relatief simpele methodes beschikbaar om reeds bij opname het risico op postontslagproblemen te inventariseren. Een dergelijke risico-screening dient onderdeel te worden van de opnameprocedure zodat er gerichte en tijdelijke ontslagvoorbereiding kan plaats vinden. (dit proefschrift)

4. Interventies om postontslagproblemen te voorkomen dienen bij voorkeur te starten voor het ontslag en gecontinueerd te worden na ontslag en dienen voorlichtende elementen te bevatten. (dit proefschrift)

5. Systematic reviews zijn nuttig maar geen garantie voor juiste besluiten. (dit proefschrift)

6. Ondanks dat de methodologie voor systematische reviews steeds beter wordt, ligt de voornaamste researchopdracht nog steeds en vooral in het uitvoeren van goede primaire studies.(dit proefschrift)

7. De term 'evidence-based' kan in veel gevallen beter vervangen worden door 'evidence-searched'.

8. Als 'in dubio abstine' een leidend principe wordt in de verpleegkunde, dan staan verpleegkundigen 95% van de tijd met hun handen op de rug.

9. Patiënten voelen zich na ontslag uit het ziekenhuis niet voldoende geïnformeerd. Dit is verwonderlijk gezien de vele mogelijkheden die er heden ten dage bestaan om informatie uit te wisselen.

10. Ontslag uit het ziekenhuis ontslaat het ziekenhuis en zijn professionals niet van hun morele verantwoordelijkheid voor de ontslagen patiënt.

11. In de rookkamer kun je heel wat opsteken.