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Abstract

To follow

Introduction

As societies are ageing societies, more frail people are likely to need health and social care support, in their home or in institutional setting. Across EU countries, the expectation is that ageing societies will mean an almost doubling of expenditure for long-term care, from the present average 1.8% of GDP to 3.6% in 2060 (European Commission, 2012, AWG reference scenario). Some countries, such as Denmark, with already relatively high expenditure levels, are expected to spend as much as 8% of GDP on long-term care. If the expected costs for medicine and welfare technology are also included, expenditure levels are expected to increase even more (AWG risk scenario). Many efforts are made to prevent the need for care to arise and more recently reforms in long-term care (LTC) have in many countries introduced an active approach, in order to assisting frail persons in their home in preserving or even restoring independence in daily activities, the so-called relablement approach.

The LTC reforms towards reablement are in accordance with the discourse of active ageing, which likewise emphasises the resources of the individual in old age. Despite obscurity in the definition and conceptualisation of active ageing, it has become a common policy discourse on ageing, and its promotion as a policy response to ageing societies is driven, in particular, by international organisations, especially the World Health Organisation (WHO), and the Organisation for Economic Co-operation and Development (OECD) (Boudiny, 2013). For example, the WHO saw active ageing as the continued participation in all aspects of life, “The word active refers to continuing participation in social, economic, cultural, spiritual and civic affairs, not just the ability to be physically active or to participate in the labour force” (WHO, 2011, p.X) ” This approach is further underlined in the new WHO policy on healthy ageing where health ageing is defined “as the process of developing and maintaining the functional ability that enables wellbeing in older age” (WHO, n.d.).

Within the EU, as well, the active ageing agenda has gained momentum as a discursive policymaking framework since 1999; and, over time, individual ‘responsibilization’ for managing and avoiding dependency has been increasingly emphasized. As an examble the European Commission in 2013 addressed the social and economic returns of considering an active approach to long-term care as a social investment strategy in line with its recommendations for social investment in, for example, child care. The Commission emphasized that reablement was part of such an approach (Rostgaard, 2015). Reablement is therefore seen to increase “the possibility of raising the overall quality of protection against long-term care risks” (European Commission, 2013: 19).

What is reablement? It is basically an active approach to assisting frail persons in becoming more independent in carrying out daily tasks related to the body and the home and in mobility tasks. Based on

the Delphi approach and responses from 72 international experts from 11 countries, a consensus on an international and overall definition of reablement has recently been reached[1]:

"Reablement is a person-centred, holistic approach that aims to enhance an individual's physical functioning, to increase or maintain their independence in meaningful activities of daily living (at their place of residence or in the community) and to reduce their need for long-term services. Reablement consists of multiple visits and is delivered by a trained and coordinated interdisciplinary team. The approach includes an initial comprehensive assessment followed by regular reassessments and the development of goal-oriented support plans. Reablement supports an individual to achieve their goals, if applicable, through participation in daily activities, home modifications and assistive devices as well as involvement of their social network. Reablement is an inclusive approach irrespective of age, capacity, diagnosis or setting." (Metzelthin et al, forthcoming).

At present, reablement is obligatory in Denmark, widespread in England and Norway and is more infrequently used in Australia, New Zealand, the Netherlands, Scotland, Sweden and the US (under the name of restorative care) (Aspinal et al, 2015; Rostgaard et al, 2015). The argument for reablement is often to increase the quality of life for the older person by focusing on re-storing self-reliance and independence of care, but it is also related to the cost-saving potential. For example, in Copenhagen municipality in Denmark, 80% of older people who apply for permanent home care services are given short-term reablement interventions instead (ref.). Municipalities unofficially report an expected success rate of 60% with regard to self-sufficiency post-intervention.

In Denmark, reablement was introduced in the legislation in Denmark in 2015. As part of the assessment for conventional home care, all municipalities must now initially assess whether reablement can be given as an alternative. Reablement is, as is the case for conventional home care, given free of charge, and usually provided intensively but short-term over 12 weeks by a multi-disciplinary team of social and health care workers, occupational therapists, nurses and if needed, also other professions. The intervention is based on goals which are set together with the client. These may involve short-term goals such as becoming independent in bathing, being able to climb the stairs etc. and more long-term goals such as being able to participate in social activities outside the home etc. Although the actual implementation of reablement may differ across the country in the organizational components, there is by now some evidence of the target group, services and professions involved as well as the outcomes. The aim of this article is to investigate how reablement may be organized and implemented in Denmark, and not least, what is the outcome for the client. We present findings from a study of one municipality in Denmark, Nyborg, which is a smaller, rural municipality with 32.024 inhabitants. 24 percent of the inhabitants are over 65.

In the paper, we apply a quantitative pre- and after evaluation approach. We initially report how reablement is organized, which professions and services are involved and in the analysis look at what is the significance of this for short- and long-term client outcomes (5 and 10 months) in loneliness (UCLA), functional ability (Barthel), health care related quality of life (EQ-5D thermometer and unweighted), as well as social care related quality of life (ASCOT) for clients 65+. We also report the significance for outcomes of the client being motivated for receiving a reablement intervention, as well as the implication of the length and number of interventions, and of the composition of various professional backgrounds of staff.

[1] This work has been initiated by the international research network, ReAble. For more information about the network as well as of reablement policies and outcomes in various countries, see https://reable.auckland.ac.nz

Methodology

Sample size

The sample of clients is based on the total population of clients 65+ who were applying for homecare and subsequently were referred to reablement in a given period of time (X-August 2016 - October 2018) in Nyborg municipality in Denmark.[2] The municipal assessment to reablement will normally be based on whether the client has so-called potential for reablement, which can depend on both an assessment of motivation for change and cognitive capability. Clients were excluded from the study if they had received home care within the last 6 months.

Measurements

Clients were measured at the time of the start of the intervention (T1) and again 5 months (T2) and 10 months (T3) later. A time lag of up to 14 days was allowed for each measurement. Overall, this has been achieved: The average time between T1 and T2 is 155,5 days (80% of the sample is between 141 and 169 days). 93 % of measurements fall within an interval of 4-6 months. The average time between T2 and T3 is 173.4 days, where 80% of the sample is between 141 and 238 days. 76% of measurements fall within an interval of 4-6 months.

A total of x persons 65+ were recruited to the study. Of these, 64 persons participated in the measurement at T1, 43 persons in the measurement at T2 and 45 persons in the measurements at T3. 37 of persons participated in all three measurements, i.e. there were 8 individuals that were not part of T2 (Table 1).

Women make up the majority of the sample, reflecting the higher share of women in these age groups. However, compared to the national representative survey Ældredatabasen (ref.), where women make up 65,1%, we have in our study a larger share of women, 75,0%. One in three (31,3% in our study live with spouse or others, which is slightly higher than in the national survey (24,2%). In our study, 35,9 % have primary education, which is lower than in the national survey (51,1%).

At the end of the intervention, the staff contact person grouped the client according to their main need and reason for applying for home care. The far majority of clients in the study were discharged from the hospital. The other client categories cover: clients' with addictions or mental disorders, clients' with cognitive difficulties and/or milder degrees of dementia, and a group covering remaining clients not fitting into any of the former three categories.

Table 1. Sample size

	Measurement 1 (T1)	Measurement 2 (T2)	Measurement 3 (T3)	Attrition
Clients, no.	64	43	45	27
Women,%	75,0	81,4	84,5	66,7
Education (primary education), %	35,9	44,2	46,7	14,8
Living with spouse/others, %	31,3	30,2	24,5	29,6

[2] We have tested whether the time of the upstart of the intervention correlated with the outcomes and this is not the case. I.e. there is no indication of the effect of reablement improving or deteriorating over time.

Attrition

The attrition between T1 and T3 tends to follow the composition in the sample, in that there are more women who drop out and those who drop out also more less often have primary education or live with souse or others (Table 1).

Data collection

Data about outcomes was collected by research assistants employed at VIVE or at the municipality of Nyborg. This was to ensure that staff performing the interventions did not collect data. The interviewers were trained in the application of the various outcome measurements and were aware that the client received the intervention. Reliability is generally high, as there is no systematic tendency in the direction of outcome scores. The far majority of interviews were conducted as visits in the home of the client (95% at T1, 93% at T2 and 76% at T3), the remaining were conducted via telephone.

In addition, the member of staff who acted as the contact person filled in two registration forms, at the upstart of the intervention and at the end of the intervention. Registration form 1 has been filled in for 60 clients and registration form 2 for 58 clients. In all, information has been filled in for both registration forms for 56 clients. In all cases, it has been the same member of staff who has filled in the form.

Data

The registration forms included questions about reason for referral, length and content of intervention and mix of professions. The member of staff were also asked to assess the client's level of motivation at start and end of the intervention, and also assess the overall achievement in regards to client goals.

As for the outcome variables, a number of standardized and validated outcome indicators are used, including a measure of loneliness using the UCLA Three-Item-Loneliness Scale (T-ILS). This includes three questions about frequency of lacking companionship, feeling left out and feeling isolated from others. There are three levels of responses. The T-ILS version is validated and in a Danish study assessed to have a high internal reliability factor (Cronbach's Alpha .89-.94).

For the description of development of activities of daily living, the Barthel 20 Index is used but with only 7 of the 10 areas of functioning included (3 functions about toilet visit and bladder and bowel control were excluded due to lack of relevance for this population). There are 3 or 4 response categories. Although the Barthel Index was originally developed as a face-to-face assessment, other studies have found it reliable also as self-administered (Pietra et al, 2011), and it can therefore be used as a subjective indicator.

EQ-5D gives an indication of subjective health related quality of life. The health situation is self-assessed through questions related to five different dimensions of mobility, personal care, usual activities, pain/discomfort, and anxiety/depressions. The question of mobility was excluded as this theme is covered in the Barthel Index also. Therefore we calculate eq-5d on the basis of unweighted variables. There are three levels of responses. The visual scale EQ-VAS is also used, in order for the client to indicate the present health situation on a 'thermometer' scale from 0-100.

Finally, the validated ASCOT measure for expected social care related quality of life (SCRQoL) is applied, both as a total weigthed score and as individual unweigthed values for each of the 8 domains relating to personal care and clothing, food, cleanliness and comfort of the accommodation, social relations, activities, feeling in control, feeling safe and overall dignity. There are four levels of responses. We use the expected

SCRQoL only as we want to document changes in the client's assessment of his/her level of social care related quality of life, not taking into account any effect of receiving help and care from social services or others.

Table 2 Outcome indicators

Measure name	Scale	Remarks on direction of scores
UCLA loneliness-scale	3-9	3 items (T-ILS). Lower values => less loneliness
Barthel 14	0-14	As Barthel 20 but with only 7 of the 10 items. Higher values => better ADL level
EQ-VAS 'thermometer'	0-100	Higher values => better at present health related quality of life
EQ-5D 20 unweighted	-0.624-1	Unweighted average of 4 questions rescaled to range as Danish EQ-5D range, Higher values =>better total score of health related quality of life
ASCOT, SCRQoL expected	-0.17-1	Indication of social care related quality of life without care services. Weigthed total score and 8 unweigthed domain values. Higher, values => better social care related quality of life

Analysis

We have used paired t-tests to calculate the average difference in outcome measures between the measuring points, and apply multilinear regression, when investigating the influence of a given parameter, such as age, functional ability etc.

Organisation of reablement in the municipality of Nyborg

Local model of reablement

Already before the changes in legislation 2015, the municipality of Nyborg experimented with reablement. Beginning in 2011 with the project Active Home Care, therapists supported home care staff in working with a more activating approach. Recognizing that it is often more time-consuming to work with a reabling approach, it was possible to allocate extra time per client. Until 2015 reablement was performed by the regular home care staff in cooperation with therapists. From 2015 onwards, a specialist multi-disciplinary team was created to perform all reablement interventions for clients not already receiving home care.

At the time of the study, reablement interventions in Nyborg municipality were thus performed by the specialist multi-disciplinary team, that operates separately from the conventional home care. The advantages of this model is that it ensures the build-up of specialist knowledge and close cooperation within the teams (Petersen et al, 2017). The specialist team-model is used by 17% of local authorities in Denmark (Rambøll 2017). The majority of local authorities instead use the integrated reablement model, where reablement is provided by members of staff who also carry out conventional home care. This model ensures smooth transition from reablement to home care and also that reablement as a principle is continuously present in all services (Petersen et al, 2017).

Team composition and collaboration

In Nyborg, the reablement team consists of seven social- and healthcare workers[3], five occupational therapists and one nurse. Additionally, the team has a formalized cooperation with two referral officers and a dietitian. Each client is assigned a personal team, typically consisting of a social and healthcare worker and an occupational therapist. Other professions – both in-team and from other parts of the organisation, e.g. physiotherapists – can be included in the intervention if relevant. For more complicated interventions, the team holds weekly coordination meetings with referral officers, dietitian, and therapists from the training/rehabilitation department as well as with other professionals of relevance to the service clients being discussed, e.g. a dementia coordinator.

Referral

Clients are referred to the team by municipal referral officers, but the team decides on the content and time use in the reablement intervention, adapting the time use to the client's need. When a client is referred to the team, the team will make a multi-disciplinary assessment of the client's needs, and will together with the client set the personal goals and plan the relevant actions or measures, e.g. ADL training or the use of assistive devices, to achieve goals. At the end of the reablement intervention, the client and staff together assess whether the goals are achieved or if continued home care assistance is needed with personal care or practical tasks such as cleaning. If so, the client will be assigned the relevant home care services, which are free of charge. The reablement service is also free of charge.

5. Intervention

Content

One of the objectives of the study was to identify the focus of the intervention by documenting the actual services provided in the reablement intervention. We find that most clients receive ADL training in the home, e.g. training in independence in carrying our personal care or cleaning (84.5 % of clients), ADL training outside the home, e.g. walking to the mailbox (12 % of clients), physical exercise in the home, e.g. light gymnastics (36 % of clients) and modifications of the home, e.g. by adding chutes or helping aids such as walkers (26 % of clients) (Table 3). For 10 % of clients the type of intervention is not described. In 60% of the interventions, the client case was discussed at one or more multi-disciplinary coordination meeting(s).

Table 3. Reablement services

Services provided	Percentage of clients
ADL training in the home	84,5 %
ADL training outside the home	12 %
Physical exercise in the home	36 %
Modifications of the home, helping aids	26 %
Case discussed at 1+ coordination meetings	60 %

[3] Social- and Healthcare workers are either trained as *Social- and Healthcare Helpers* (SSH) (length of formal education/training is 1 year og 2 months, with 24 weeks of formal education and training and 36 weeks of on-the-job training) or trained as *Social- and Healthcare Assistants* (SSA) (total length of formal education/training 1 year and 8 months, with 32 weeks of formal education and 52 weeks job training).
https://sosunord.dk/media/43391/sshuddbeskrivelseeng.pdf
https://sosunord.dk/media/43474/ssauddannelsesbeskrivelseeng.pdf

Most clients (48 %) only receive one of the above interventions, while the remaining receive 2-4 interventions, e.g. both ADL training in the home and physical exercise as part of the reablement intervention. Only 5 % receive all four types of interventions.

Table 4. Number of services

Number	% of clients
No description	10,34 %
1 service	48,28 %
2 service	18,97 %
3 service	17,24 %
4 services	5,17 %

Length

In their description of reablement, the municipality of Nyborg quote the maximum length of interventions to be of 12 weeks (Nyborg Municipality, 2016 and n.d.). In our study the maximum length was 104 days, i.e. the equivalent of 14.8 weeks. The shortest intervention lasted 3 days.

The average length of the reablement interventions in the study is 40.5 days, i.e. around 5.7 weeks, with a median of 38 days and a SD of 24.7 days. 50% of the interventions lasted between 20 and 60 days.

Professional skills mix

Reablement is by definition a multi-disciplinary approach, so which professions have been involved in the interventions in our study and what combinations of professions are applied in the interventions? Our data shows that the team's social- and health care workers have been involved in 86 % of the interventions whereas the occupational therapists have been involved in 74 % (Table 5). Although there is only one nurse in the team, the nurse has been involved in 34.5 % of the interventions (for all data no information about the degree of involvement and thus whether it has included shorter or longer consultations and/or actual home visits).

Table 5. Team members involvement in intervention

Team member	% of interventions
Social- and health care workers	86 %
Occupational therapists	74 %
Nurse	34,5 %

Re. the combination of professions in the individual interventions, some interventions were mono-disciplinary: 15 % of interventions involved social- and health care workers only and 3.7 % of interventions occupational therapist only (Table 6). The nurse has not been the only profession in any interventions. However, most interventions have been multi-disciplinary. In 44.5 % of the interventions, the service client's team consisted of a social- and health care worker and a therapist. The combinations of therapist and nurse and social- and health care worker and nurse each covers 3.7 % of the interventions. In 27.8 % of the interventions, the team has consisted of all three professions.

Table 6. Multi-disciplinary combinations of professions in the intervention

Professions	Percentage of interventions
Social- and health care worker only	15 %
Occupational therapist only	3,7 %
Nurse only	0 %
Social- and health care worker and therapist	44,5 %
Social- and health care worker and nurse	3,7 %
Nurse and therapist	3,7 %
Social- and health care worker and therapist and nurse	27,8 %

Besides team-members, a variety of other professions outside the team have been involved in the reablement interventions (Table 7). Especially physical therapists from the health- and training department, who have been involved in 44,8 % of the interventions, occupational therapists regarding helping aids and home modifications (12 % of interventions) and municipal nurses, who have been involved in 13.8 % of the interventions. Finally, a municipal dietician has been involved in 3,45 % of interventions.

Table 7. Examples of involvement of professions outside the team

Profession	Percentage of interventions
Physical therapists from health- and training department	44,8 %
Occupational therapists re. helping aids and home modifications	12 %
Municipal nurses	13,8 %
Dietician	3,45 %

Motivation

As part of filling in the registration forms, the member of staff working closest with the client has assessed the client's level of motivation for participating in a reablement intervention, at the start of the intervention as well as the end. The far majority of clients were assessed to be very highly motivated, 45 %, or highly motivated, 35% (Table 8). At the other end of the scale, less than 2 % were believed not to be motivated at all. This finding is in accordance with the overall aim of providing reablement to clients who are willing to and motivated for participating in reablement. At the end of the intervention, the member of staff found that even more clients were very highly motivated, 60 %, while less were 'only' highly motivated, 19 % (Table 9). 4% were assessed not to be motivated at all (no significant increase).[4]

Table 8 User motivation at start of intervention (as assessed by staff)

Level of motivation	Percentage of clients
Client is not motivated at all	1,67 %
Client is moderately motivated	15 %
Client is highly motivated	38,33 %
Client is very highly motivated	45 %
n	60

[4] The clients was also asked in the questionnaire about level of motivation and perceived achievement, but only few responded, n=20.

Table 9 User motivation at end of intervention (as assessed by staff)

Level of motivation	Percentage of clients
Client is not motivated at all	3,45 %
Client is moderately motivated	15,52 %
Client is highly motivated	18,97 %
Client is very highly motivated	60,34 %
No answer	1,72 %
n	58

Goal achievement

Members of staff were in registration form 2 also asked to assess whether the client had achieved his/her goals for the intervention. The far majority found this to be the case, 67%. 21% said they partly agreed, and 4 % disagreed (Table 10).

Table 10. Goal achievement

Did the client achieve his/hers goals?	Percentage of clients
Fully agree	67,24 %
Partly agree	20,69 %
Neither agree/disagree	5,17 %
Disagree	3,45 %
No answer	3,45 %
n	58

6. Outcomes

Table 11 outlines the changes in the outcome measures, both the average value at the time of measurement and whether changes over time are significant. Our main analytical interest is the change from T1-T3 but we also report changes from T1-T2 and from T2- T3. The p-values indicate significant changes for those clients that are measured at the exact two measure points, and n therefore varies.

As outlined in Table 11 there is a tendency in a positive development from the first measure point, T1, to the second, T2, i.e. within the first 5 months from the start of the intervention. This is to be expected, as the clients were predominantly discharged from hospital and were likely to be motivated for quick recovery.

We see significant changes at 5 % significance level from T1 to T2 in activities of daily living (Barthel) and in health related quality of life (EQ-5D, both unweighted and thermometer). We also note a significant change at the 5 % level in social care related quality of life (SCRQoL), both in total score as well on two out of eight ASCOT domains (feeling clean in clothes and comfortable in appearance as well as being able to participate in meaningful activities. Getting the food and drinks required and at the right time is nearly significant at a 10% level). Also positive, is that there is no significant development in loneliness (UCLA).

However, from T2 to T3, we see a significant 5 % negative development in Barthel as well as in total SCRQoL and one SCRQoL domain (getting the food and drinks required and at the right time).

The question is whether the client gains overall during the 10 months? This is illustrated in the final analysis in the table, which shows whether there are significant changes over time from T1 to T3, i.e. from start to 10 months after the intervention. Here, we find that there is no development in loneliness. The change in

EQ5D unweighted is positive and highly significant (0,001% level). There is also a significant positive development on Barthel.

There are no significant changes in EQ5D thermometer nor in total SCRQoL. One of the SCRQoL domains shows significant positive development (feeling clean in clothes and comfortable in appearance), and another is nearly significant at a 10% level (food).

The analysis indicates that there is a positive outcome in health related quality of life and in ability to function in daily activities 10 months after the start of the intervention, as well as no development in loneliness. However, we see no overall development in social care related quality of life and only some indication of improvements in singular domains.

Table 11. Outcomes at the three measure points

Variable	T1	T2	T3	p-value (T1 to T2)	p-value (T2 t0 T3)	p-value (T1 to T3)	n
UCLA	4.02	4.05	3.91	0,44	0.74	0.76	43-62
barthel14	11.88	13.10	12.60	0,00	0.01	0.02	42-60
EQ5D_term	65.20	76.13	64.95	0,00	0.08	0.74	30-44
EQ5D_unwgt	0.41	0.57	0.60	0,00	0.51	0.00	39-57
expected_SCRQoL	0.53	0.66	0.61	0,02	0.03	0.31	42-57
expected SCRQoL _control	0.51	0.61	0.65	0,27	0.89	0.08	43-62
expected SCRQoL _clean	0.65	0.80	0.78	0,01	0.63	0.03	43-63
expected SCRQoL _food	0.70	0.80	0.70	0,10	0.05	0.88	43-63
expected SCRQoL _safety	0.40	0.52	0.47	0,12	0.34	0.52	43-61
expected SCRQoL _social	0.73	0.75	0.77	0,46	0.78	0.91	42-62
expected SCRQoL _activities	0.66	0.76	0.70	0,03	0.10	0.80	43-61
expected SCRQoL _accommodation	0.64	0.64	0.58	0,78	0.02	0.34	43-64

Note: The P-value for the change over time is based on a paired samples t-test. All indicators except UCLA: the higher the scores, the better outcome

A further analysis of the sub-components in the EQ5D and Barthel outcome measures indicates that the development takes place in areas, which are of focus in the reablement intervention, such as personal care, dressing and more overall daily activities.

We see significant improvements in sub-components from EQ-5D such as personal care and problems about carrying out usual activities. There is an initial improvement in anxiety but this is not persistent over

time. From Barthel, we see a maintained improvement over time in ability to independently bathe/shower and in getting dressed/undressed. Indoor mobility is improved initially but not maintained. And we also see a nearly significant improvement in climbing stairs at a 10% level.

Table 12. Analysis of sub-components of EQ-5D and Barthel

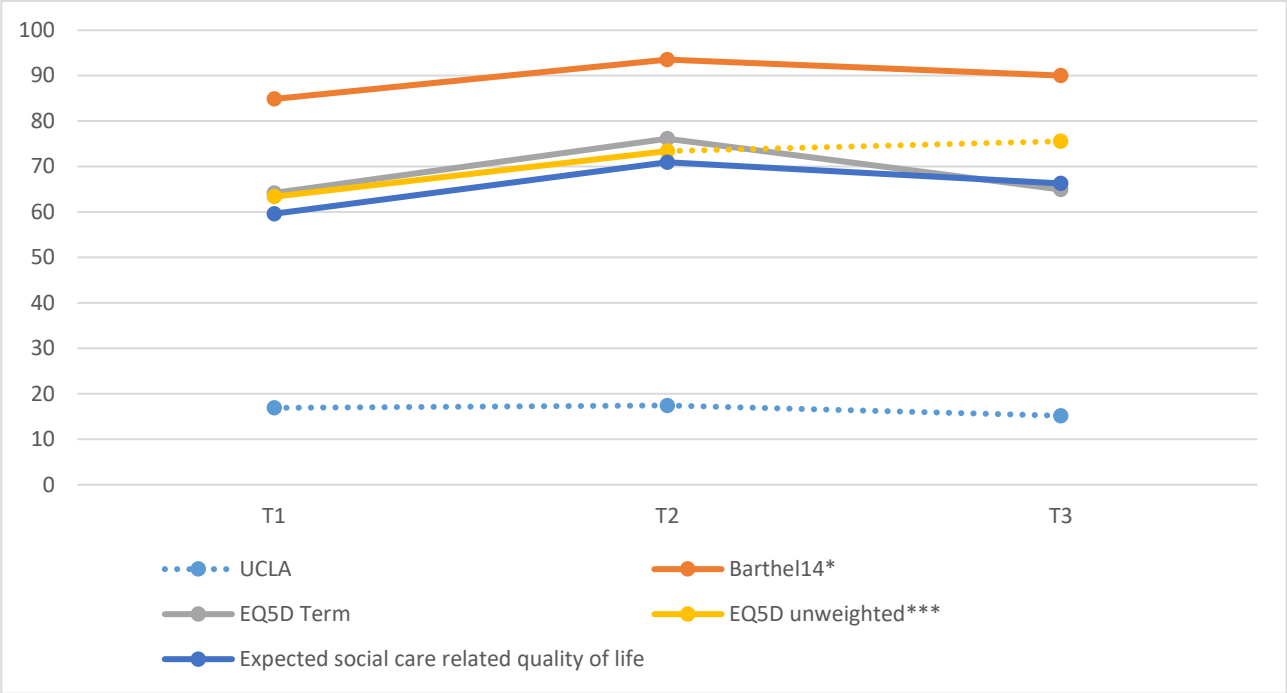
Variable	T1	T2	T3	p-value (T1 to T2)	p-value (T2 t0 T3)	p-value (T1 to T3)	n
EQ-5D:							
EQ_personal care	0.77	0.88	0.89	0.03	0.66	0.01	43-64
EQ_usual activities	0.41	0.67	0.72	0.00	0.81	0.00	39-57
EQ_pain/feeling uncomfortable	0.54	0.53	0.57	0.60	1.00	0.28	43-64
EQ_anxiety	0.85	0.83	0.82	1.00	0.04	0.37	43-64
Barthel:							
B_intake of food	0.20	1.98	1.96	0.32	0.32	0.57	43-64
B_bathing/showering	0.48	0.84	0.82	0.00	0.16	0.00	43-64
B_basic personal care	0.98	0.95	0.98	0.32	0.32	1.00	43-64
B_dress	0.17	1.88	1.84	0.00	0.18	0.04	43-64
B_moving from bed to chair	2.92	3.00	2.98	0.10	1.00	0.26	43-64
B_indoor mobility	2.67	2.86	2.58	0.18	0.01	0.09	43-64
B_climbing stairs	1.23	1.60	1.40	0.14	0.09	0.23	43-60

The P-value for the change over time is based on a paired samples t-test. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001. All indicators except UCLA: the higher the scores, the better outcome. The analysis is based on a multilinear regression.

Overall, this suggest that the reablement can ensure improvements in areas of daily activities. Nevertheless, the development is somewhat pyramid shaped, in that ther initial positive development later wears off for all but EQ-5D. This is illustrated in Figure 1, where the values are rescaled from 0-10 for the sake of comparison (not showing the SCRQoL domains). The broken lines indicate non-significant development between T1-T2 and T2- T3, all other lines are significant. Significant changes from T1-T3 are indicated in the table signature with levels of significance (+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001).

The figure illustrate the results from the table: Clients who receive reablement experience within the first 5 months an initial and significant increase in all main outcome indicators apart from loneliness. This effect significantly decreases within the following 5 months on all apart from EQ5D unweighted. Loneliness is again not affected. 10 months after the start of the intervention, there is a consistent positive and highly significant change compared to the first measurement, in health related quality of life (EQ5D unweighted) and less significant but positive in daily activities (Barthel). Loneliness (UCLA) stays at the same level, as does ratings of health on the particular day (EQ-5D thermometer).

Figure 1. Changes in outcome measures from T1-T3



Note: n=39-64. The P-value for the change over time is based on a paired samples t-test. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001. All indicators except UCLA: the higher the scores, the better outcome. The analysis is based on a multilinear regression.

Explanatory factors

A number of factors are associated with the changes in the outcome indicators from T1-T3. This includes individual client characteristics. As presented in Table 12. women have a higher increase in social care related quality of life (SCRQoL) than menat the 10-months measure point. On the other hand, women have a significantly lower development in loneliness (UCLA) than men. However, the largest difference is found in health related quality of life (EQ5D unweighted) which increases over time more for those who live with a spouse or partner.

Table 12. Predictors for change from T1 to T3: Client characteristics

	ΔUCLA	ΔBarthel	ΔEQ5D term	ΔEQ5D unwgt	ΔExpected
Woman	-0.847+	1.081	6.471	0.147	0.337*
	(0.439)	(0.951)	(16.67)	(0.150)	(0.130)
Education	0.136	-0.254	2.682	-0.0262	0.0181
	(0.117)	(0.282)	(4.410)	(0.0444)	(0.0344)
Married/cohabiting	-0.377	0.808	26.51+	-0.0568	0.0726
	(0.352)	(0.830)	(15.18)	(0.131)	(0.107)
_cons	0.485	0.268	-14.66	0.131	-0.297*
	(0.456)	(1.053)	(17.18)	(0.167)	(0.146)
n	44	41	28	39	41
r2	0.105	0.0639	0.128	0.0410	0.163
F	1.569	0.842	1.170	0.499	2.394
Rmse	0.945	2.237	29.62	0.350	0.284

Standard errors in parentheses + p<0.10, * p<0.05, ** p<0.01, *** p<0.001. The analysis is based on a multilinear regression.

We have also investigated whether the professional background and the number of reablement services, which have been given, are associated with the outcome. It is important to be cautious in such an analysis as a client with a more complicated needs situation is assumed to be more likely to receive a multi-disciplinary intervention and many services. We therefore also control for the correlation between these factors.

We find that only one of the factors are significant. It seems the involvement of a therapist in the intervention is associated with a better outcome in regards to health related quality of life (EQ5D thermometer) (table 13). It does not seem to affect the outcome whether a nurse or social and health care worker (SOSU) is involved, compared to when they are not involved.

Table 13. Predictors for change T1-T3: Professions and number of reablement services

	ΔUCLA	ΔBarthel	ΔEQ5D term	ΔEQ5D unwgt	ΔExpected
SOSU	0.538	-0.966	22.55	0.0352	-0.137
	(0.412)	(1.209)	(15.36)	(0.217)	(0.138)
Therapist	-0.205	1.313	-32.78*	0.154	0.143
	(0.331)	(0.850)	(12.53)	(0.135)	(0.112)
Nurse	-0.514	-0.173	19.44	0.0801	-0.0526
	(0.341)	(0.917)	(14.01)	(0.132)	(0.119)
index_no. interventions	-0.224	0.340	-9.408	-0.00375	-0.00738
	(0.153)	(0.358)	(8.184)	(0.0578)	(0.0516)
_cons	0.141	0.265	14.44	0.00970	0.0879
	(0.407)	(1.049)	(16.82)	(0.231)	(0.136)
n	42	39	26	37	39
r2	0.140	0.110	0.296	0.0501	0.0652
F	1.512	1.051	2.207	0.422	0.593
Rmse	0.940	2.247	27.32	0.355	0.313

Linear regression analysis controlling for differences in all other characteristics. Standard errors in parentheses + p<0.10, * p<0.05, ** p<0.01, *** p<0.001. The analysis is based on a multilinear regression.

A number of the characteristics of the interventions are also associated with a better outcome. Most take the expected direction but not all are significant, most likely due to the small number of observations (Table 14). Quite expectedly, motivation seems to be associated with the outcome, at least for one outcome indicator: We find that the higher the client motivation at T1, the higher the outcome for social care related quality of life (SCRQoL total). There is on the other hand an interesting association between higher motivation at the end of the intervention and lower development in health related quality of life.

Having more staff than just the reablement team involved seems to affect the client positively in regards to not feeling lonely. On the other hand, it seems to be negatively associated with social care related quality of life. The reason for this may be that clients with high needs will most likely have many interventions involving many members of staff.

We have also looked into whether there is an association between the client outcomes and that the client's case has been discussed at a coordination meeting. This would typically be more complicated client cases, which may also explain the lack of association with improvements over time.

Table 14. Predictors for change: Characteristics of interventions

	ΔUCLA	ΔBarthel	ΔEQ5D tm	ΔEQ5D uw	ΔExpected
Motivation at start	0.0109	0.103	3.680	0.0708	0.142*
	(0.201)	(0.492)	(7.631)	(0.0873)	(0.0612)
n	42	39	27	37	39
Length of intervention (days)	-0.00351	0.00380	0.0408	0.000732	0.000493
	(0.00635)	(0.0151)	(0.253)	(0.00229)	(0.00203)
n	42	39	26	37	39
Goal achievement	0.298	0.795	9.324	0.0847	0.0930
	(0.276)	(0.668)	(9.450)	(0.0991)	(0.0892)
n	40	37	25	37	37
Motivation at end	-0.0519	0.318	-16.58**	0.0294	0.0222
	(0.177)	(0.437)	(5.859)	(0.0754)	(0.0573)
n	41	38	25	37	38
No. of interventions	-0.283	0.624	8.250	0.0135	-0.000110
	(0.177)	(0.395)	(9.660)	(0.0654)	(0.0575)
n	38	35	24	34	35
Other disciplines apart from team	-0.457+	0.184	3.475	-0.120	-0.152*
	(0.248)	(0.543)	(8.647)	(0.0841)	(0.0648)
N	24	24	14	23	23
Coordination meeting	0.208	0.626	5.486	0.0757	0.182
	(0.400)	(1.033)	(18.09)	(0.151)	(0.132)
N	42	39	26	37	39

Standard errors in parentheses + p<0.10, * p<0.05, ** p<0.01, *** p<0.001. The analysis is based on a multilinear regression.

Conclusion

Reablement is a new multi-disciplinary and goal-oriented approach in long-term care for older people, which aims at assisting individuals in becoming independent in daily tasks. The underlying assumption is that the client can become partly or fully independent of services, and thus in ageing societies ensuring sustainability in the long-term care system as well as ensuring better quality of life for the individual.

The aim of this paper was to investigate how reablement is organized and implemented in Denmark, where reablement has been obligatory since 2015, and not least, what is the outcome for the client, using a local examble of implementation in Nyborg municipality. Our study shows that intervention is relatively short and predominantly focused on training in daily activities related to the body, the home and mobility: On average, the interventions span 5.7 weeks. In the majority of cases, the intervention involves ADL training in the home in regards to reach independence in carrying out personal care or cleaning. For half of the

interventions, this was the only service provided. Around one in three clients participated in light gymnastics in the home or had modifications to the home. In fewer cases, also ADL training outside the home or light physical training in the home was provided.

Our study shows that in most interventions the multi-disciplinary team approach is used and that the social and health care worker along with the occupational therapists are the key professions involved. The team usually consists of a social- and health care worker and an occupational therapist, sometimes combined with a nurse. The social and health care worker was the profession most often involved in the intervention, closely followed by the occupational therapist. The nurse was involved in one in three interventions.

Staff generally rate the clients to be highly motivated at the start of the intervention. They also find that the levels of motivation are even higher at the end of the intervention. Generally, the staff also assess positively the client's achievement of goals at the end of the intervention.

The study has followed client development in outcome indicators over 10 months in all, at the start of the intervention, 5 months later and another 5 months later. We identify an initial positive development in all of the outcome indicators, apart from one: 5 months after the start of the intervention the client has a positive development in health related quality of life (EQ5D), daily activities (Barthel) as well as in total social care related quality of life (SCRQoL), and also in some SCRQoL domains. Loneliness does not seem to increase within this time period.

However, the improvements do not continue and we even find a decline over time: Compared to the 5-month measurement, we find at the 10-month measurement a significant decline in daily activities (Barthel) and total social care related quality of life (SCRQoL) as well as in the domain of food.

The development is thus pyramid-shaped: initial improvement and later some decline. However, looking across the entire 10 months' time span, there seems to be a highly significant and positive development in health related quality of life (EQ5D unweighted) and less significant but positive developments in daily activities (Barthel). As the study does not involve a control group, we cannot isolate the effect of reablement, not least because the majority of the clients in our study was recently discharged from hospital and therefore likely to be motivated for quick recovery. If reablement is given to clients who receive conventional home help, some of these changes may be seen also. Nevertheless, the results suggest that reablement can support a continued improvement in subjective perceptions of health related quality of life and in independence in daily activities. However, the results also indicate that outcomes may decline within a relatively short time after the end of the intervention. This underlines that client development must be followed over longer time than just at the end of the intervention, and at best beyond the 10 months applied in this study.

The study also points at some factors, which may contribute to explain outcomes: Compared to men, women tend to fare better in regards to developments in loneliness and in social care related quality of life after the 10 months. Having a spouse also has a positive effect on the development of health related quality of life. This suggest that the spouse or partner may encourage the continued training of independence in daily activities.

There is some indication that interventions involving an occupational therapist has a better outcome in regards to present health related quality of life (EQ5D thermometer). The study has also investigated how motivation may affect outcomes. The assumption was that client motivation at the upstart of the intervention would be highly indicative for the outcome. This seems only to be the case for social care related quality of life (SCRQoL). Also, we do not see any association between length of intervention and

number of services in regards to outcomes, which is most likely due to that clients with more complicated cases will most likely receive longer interventions and more services. Having other disciplines than the reablement team involved, seems positively associated with loneliness but negatively associated with social care related quality of life. This may again be explained by the client's needs situation where clients with complicated needs situations may require visits from dietitian, dementia consultant etc.

Overall, out study suggests that reablement can support continued development in quality of life and independence in daily activities but that some of the initial positive results are modified within a short time after the end of the intervention. A team composed of social and health care worker and occupational therapist seems to produce better outcomes, and having a supportive home environment increases the likelihood for continued client development.

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Literature

Nyborg Municipality (2016) Rehabiliteringsforløb, http://ipaper.ipapercms.dk/NyborgKommune/Hjemmesiden/Borger/Sundhedsogomsorg/rehabiliteringsforloeb-aug2016/#/

Nyborg Municipality (n.d) Hjemmehjælp, https://www.nyborg.dk/da/Borger/Senior/Hjemmehj%C3%A6lp

Petersen, Anne; Lea Graff, Tine Rostgaard, Jakob Kjellberg og Pia Kürstein Kjellberg (2017): Rehabilitering på ældreområdet - Hvad fortæller danske undersøgelser os om kommunernes arbejde med rehabilitering i hjemmeplejen? København: KORA.

Pietra, G.L., Savio, K., Oddone, RN, Reggiani, M., Monaco, FM, Leone, MA. (2011) Validity and Reliability of the Barthel Index Administer, in Stroke, (42), pp 2077-2079.

WHO (2011) WHO Statement on the right to health of older persons. Statement at the 18th Session of the UN Human Rights Council.

WHO (n.d.) What is Healthy Ageing, downloaded June 10th 2019 https://www.who.int/ageing/healthy-ageing/en/