The main focus of this thesis was the effects of a multidisciplinary integrated care approach on quality of care. Moreover we studied the incidences of mental dysfunctions for residents in Dutch residential care homes and nursing homes. The initiative for this research project underlying this thesis was financially supported by the Netherlands organisation for health research and development (ZonMw). The research project started in 2007 and ended in June 2010. At the start of the project we realised that there are three main problem areas in current Dutch institutionalised aged care. Health care is insufficiently patient-orientated and integrated. The role of the elderly person and his/her environment is very limited. A greater degree of self-determination in the care process is possible, as well as a better alignment between the care and the care needs of the elderly person. In addition there is insufficient alignment between care providers. Health care providers are insufficiently timely in identifying frail elderly persons with unfulfilled care needs and health risks. Last but not least, knowledge and proven effective innovations are insufficiently implemented. The hypothesis was that implementing an integrated care approach on the basis of already existing principles of the chronic care model, would substantially improve the health care quality and by that the quality of life and well-being of the elderly living in de homes for the elderly. In this last chapter of the thesis we discuss the main findings, and some theoretical and methodological considerations. We will finalise the thesis with recommendations for further improving the quality of care for residents in residential care homes and future research on this complex group of patients.
In chapter 6, a study on the incidence of depression and its associated risk factors in Dutch nursing homes compared with the incidence and associated risk factors in residential care homes, is described. Data were extracted from the Long Term Care Facility (inter RAI-LTCF) version of the Resident Assessment Instrument which was filled in a routine care cohort for a total of 3627 residents. 621 residents of 6 nursing homes and 988 residents of 23 residential care homes were included in the analyses. The incidence rate was 13.6 per 100 person-years and 10.2 per 100 person-years for residents of nursing homes and residential care homes respectively and higher than previous reported incidences. The independent risk factors for incident depression in residents of nursing homes included dementia and a score of three or higher on the Depression Rating Scale. The risk factors in residents of the residential care homes included being male, having a cancer diagnosis and a score of two or higher on the Cognitive Performance Scale. Age over 85 showed to be protective in both settings. Hearing impairment showed to have a protective effect in the residential care homes and use of hearing aid in the nursing homes.

In chapter 7, a study on possible under diagnoses of depression in demented residents in residential care homes is described. In this cross-sectional study the prevalence of diagnosed depressive disorders and observed mood symptoms between demented and non-demented residents of Dutch residential care homes were compared. Routine outcome measurements by trained nurse assistants using the Resident Assessment Instrument of residents in sixteen residential care homes, were analysed in this study. No statistically significant difference was found between demented and non-demented residents in the presence of diagnosed depressive disorders. However, the observed mood symptoms were more prevalent in persons with dementia than in people without dementia. Among persons with mood-symptoms, demented residents were less likely to be diagnosed with a depressive disorder than non-demented residents. We concluded that the prevalence of diagnosed depressive disorders was comparable between demented and non-demented residents. However, demented residents suffered more from mood symptoms and may be at risk of under-diagnosis of depression.

In chapter 8, the prevalence and incidence of delirium in residents of residential care homes and nursing homes was reported as well as the risk factors associated with the onset of delirium. Data were extracted from the Long Term Care Facility (inter RAI-LTCF) version of the Resident Assessment Instrument which was filled in a routine care cohort for a total of 3627 residents. 828 residents of 6 nursing homes and 1365 residents of 23 residential care homes were included in the analyses. Delirium was defined as a positive score on the adjusted Nursing Home–CAM. The prevalence of delirium was 8.9% in the nursing homes and 8.2% in the residential care homes. The incidence was highest in the nursing homes with 20.7 versus 14.6 per 100 person years. The higher percentage of delirium found in nursing homes may be related to the fact that persons in the nursing homes were more ADL dependent, had a higher rate of daily incontinence and were restrained more often (bed rails, trunk restraints and chair restraints). Multivariate analysis showed that the risk of developing delirium in the nursing homes was highest in patients with dementia, Parkinson’s disease, and those who were restrained in a chair. In the residential care homes.

In chapter 4, we present the study of cost-effectiveness of the multidisciplinary integrated care approach. The economic evaluation was conducted from a societal perspective. Outcome measures included a weighted sum score of Quality of life indicators, functional health (COOP WONCA) and Quality Adjusted Life-Years (QALY). Missing cost and effect data were imputed using multiple imputations. Bootstrapping was used to analyze differences in costs and cost-effectiveness. The difference in costs between the usual care and multidisciplinary integrated care was not significant. The costs of providing multidisciplinary integrated care were at most €225 per resident, including implementation costs. Total costs were €2,061 in the intervention group and €1,656 for the usual care group (mean difference €405). The probability that the intervention was cost-effective was 0.95 or more for ceiling ratios larger than €129 regarding patient related quality of care. A multidisciplinary integrated care approach may be considered cost-effective in comparison with usual care.

In chapter 5, a study of the impeding and facilitating factors of the implementation of a geriatric assessment instrument (inter RAI-LTCF) as a driving element of multidisciplinary integrated care is described. These factors were studied in the initial phase and 3 years after using a mix of quantitative and qualitative methods. These methods comprised surveys, semi structured interviews and in-depth interviews. Facilitating factors after 3 years remained the lack of time to complete the assessments and lack of sufficient computer equipment. We concluded that impeding and facilitating factors were comparable in the initial and maintenance phase. Adoption of the inter RAI-LTCF assessment method depended on positive opinions of staff and management, continuing support of staff, predominantly in time, training and coaching, and the availability of sufficient computer equipment.

In chapter 3, the study on the effects of a multidisciplinary integrated care approach on the quality of care for and quality of life of residents in residential care homes compared to usual care is presented. This was studied in a pragmatic cluster randomised controlled trial involving ten Dutch residential care homes that included 462 residents with physical or cognitive disabilities. Five of the residential care homes applied multidisciplinary integrated care, and five provided usual care. The intervention consisted of three-monthly geriatric assessments of functional health including decision support with the inter RAI-Long Term Care Facilities instrument by trained nurse-assistants, discussion of the outcomes and care priorities with the family physician, the resident self and her/his family and finally monthly multidisciplinary meetings to discuss complex residents. The intervention homes performed significantly better on the sum score and on 11 out of 32 ‘quality of care’ indicators. Moreover, less mortality and a tendency for more positive opinions on the quality of care by intervention residents was observed. Functional ability, number of hospital admissions and health-related quality of life remained comparable between the two groups. In the intention-to-treat analyses, no differences in disability or quality of care as seen through residents’ eyes were found between the two groups of facilities. In the per-protocol analysis, residents in the intervention facilities tended to be more positive. Process of care outcomes indicate that training and empowerment of nurse-assistants, which was completed for all intervention homes, together with monitoring using the geriatric assessment instrument, were likely to be the most important ingredients for improvement of the quality of care. To conclude, compared with usual care, the multidisciplinary integrated care approach resulted in a higher quality of care for elderly people in residential care homes.
care homes, the risk of developing delirium was highest for residents with dementia and residents who had experienced at least one fall incident in the last 3 months. These factors can be considered indicators of quality of care and could be modifiable. The risk factors that we found are probably related to the characteristics of our population (the "oldest" old and most vulnerable elderly), but also to the specific conditions of long-term care facilities where the quality of care is under pressure nationally and internationally. We concluded that the prevalence and incidence of delirium was high in both nursing homes and residential care homes. More focus on modifiable risk factors such as the use of restraints in nursing homes and fall incidents in residential care homes may help to prevent delirium.

THEORETICAL AND METHODOLOGICAL REFLECTION

THEORETICAL. The elements of the chronic care model according to Wagner et al. comprise a clinical information system, decision support, delivery system, and self-management support that lead to productive interactions between prepared proactive practice teams of care providers and informed activated patients.(12) Moreover, the individual interaction between elderly people living in residential care homes and the nurse-assistant who has a direct responsibility, contributed to the improved outcomes in our study. In order to get this result we adapted the principles of the chronic care model to suit institutionalised elderly people. All of these elements were applicable with the exception of self-management support. The latter was hampered by severe disablement and cognitive impairment of the majority of the residents. Therefore, we trained the nurse-assistants in systematically monitoring residents and better communication with the residents, medical staff and families. The introduction and implementation of the multidisciplinary integrated care approach we used was as expected complex and demanded a substantial effort of the care organization. The implementation of the three monthly assessments with inter RAI-LTCF as a driving element of the multidisciplinary integrated care approach demanded the greatest effort on the part of the organisation, and the good use of this instrument is vital for the performance of the model. The impeding factors are described in chapter 5. The most persistent impeding factors concerned the shortage of time and lack of sufficient equipment, such as enough and good working computers. Therefore quarterly assessments of the residents proved to be impossible to maintain. So after the study period the number of assessments was diminished to every six months. Despite these barriers the implementation in the ten participating residential care homes in this study was introduced as routine daily care.

METHODOLOGICAL. This study is one of the few studies that targets care in residential care homes. Its pragmatic study design resembles clinical practice to a high degree, which increases the relevance of the study results. An additional strong point of this study is the fact that this is the first cost-effectiveness analysis study investigating the Inter RAI-LTCF in this particular population. Our main study was limited by the fact that the participants were frail elderly people living in residential care homes and comprised a high percentage of cognitively impaired residents. As a result, a portion of the data was collected from interviews with proxies. The judgments of proxies may have differed from the residents’ judgments. Therefore, we adjusted for proxy interview and cognitive status in our analyses. The cluster randomization produced an imbalance between the intervention and control homes in the number of participating residents and in some of the functional characteristics of the residents at baseline. Although we adjusted for the imbalance in functional characteristics, imbalance in the number of participating residents may have led to underpowered results. Variation across the intervention facilities in the application of the complete protocol (3%–66%) was another limitation. This variation can be explained by financial and administrative issues during the study period. The financial obligations for residential care facilities resulting from a new national funding system for residential care of elderly people caused uncertainty about job continuation, high turnover of managers and new priorities at the homes in this study. We found that functional ability, number of hospital admissions and health-related quality of life remained comparable between the multidisciplinary integrated care group and usual care group. In the intention-to-treat analyses, no differences in disability or quality of care as seen through residents’ eyes were found between the two groups of facilities. In the per-protocol analysis, residents in the intervention facilities tended to be more positive about the quality of care. Health related quality of life was measured using a short-form 12-item version of the Rand Health Insurance Study questionnaire.(11) It is known by previous studies that elderly people aged over 85 have higher scores except for social functioning than elderly people aged 75-84. The oldest old may have lower standards of living. Many friends and relatives are already deceased or suffer from chronic diseases.(11) This may explain the fact that we did not find differences in health related quality of life between the intervention group and the control group. Elderly people living in residential care homes have a heterogeneous mix of chronic conditions that naturally erode health over time, which makes it difficult to know if an intervention of this sort would be able to override the downward trend of health states associated with chronic conditions in such a short time span. As the duration of the trial was short, sensitive instruments were vital. Perhaps the generic quality of life outcome variables were not sensitive enough to pick up differences within such limited time interval. Data used for studies on depression and delirium were extracted from the VU naturalistic cohort on routine care monitoring with the Minimum Data Set of the Resident Assessment Instrument. Regarding the international large samples of assessments with the inter RAI versions and its reliability the outcomes of inter RAI assessments will represent the clinical health status of the resident.(2,6-8) Such data are regularly national and international used for research and are recommended.(4) All current medical diagnoses relevant for the personal care plan are recorded in the disease diagnosis part of the inter RAI-LTCF. An important strength of using these data is the significant external validity: no selection of subjects was made for the data collection as this was part of routine care independent of the resident’s cooperation. This enabled us to include residents who would be excluded in other studies because of physical illness, cognitive dysfunction, insufficient communication or refusal. Although the nursing assistants who completed the RAI-LTCF were trained to register observed behaviour objectively and were assisted by an expert-supervisor, (systematic) errors in rating symptoms in residents could not completely be ruled out. For the study on incidences and associated risk factors of delirium we used the Nursing Home–Confusion Assessment Method (NH-CAM) developed by Dosa et al. As we used data from an updated version of interRAI-LTCF, we had to translate our items into the items of the NH-CAM. Although the fact that the original NH-CAM was found to have good face and content validity neither the original NH-CAM nor our adjusted version was validated yet against a clinical diagnosis of delirium.

PRACTICAL IMPLICATIONS AND RECOMMENDATIONS

The results of this study are suitable for settings such as residential care homes and nursing homes and even for elderly living in a community. In all of the primary care settings it may be beneficial to have a model to monitor the chronically ill and elderly to prevent a functional decline and acute hospitalisations. It is also important to have an instrument that not only delivers output on the patient levels but also on the management level. It should facilitate managers to monitor and increase the quality of care in a sector of health.
care that is under enormous societal pressure to improve performance. The inter RAI-LTCF is such an instrument. Future research should look at the reasons as to why the residents in the multidisciplinary integrated care group were satisfied with the multidisciplinary integrated care approach and why it did not translate over to the other clinical outcome variables. Longer term cost-effectiveness analysis will provide a more reliable outcome as the results in this study were relatively short term.

FUTURE IMPLICATIONS

Many is already written about the deficiencies in care for patients with chronic diseases and for elderly people. Despite reports and recommendations of national and international Health Councils less than expected is accomplished and quality of care is under pressure. (3;5;9;10) The multidisciplinary integrated care approach as a variation on the chronic care model, does not offer a quick and easy fix; it is a multidimensional solution to a complex problem. However it is a tangible guide to improve practice and not an abstract theory. (1) It demands a paradigm shift of professionals, from individual responsibility to team responsibility with a higher contribution of non-physician personnel and a more central role for nurses. It demands better collaboration with primary care physicians, elderly care physicians and other professionals specialized in chronic care. Financial barriers should be eliminated and care providers should initiate the elements of the chronic care model. This study showed that it can be done.(1) Our study presents a substantial improvement in quality of care already achieved in a 6 months period. The nurse-assistants, the family physicians, the elderly care physician and psychologist representing the pro-active care team in our study were enthusiastic and still embracing all elements of this approach in their daily routine. The residents of the ten residential care homes and their family or relatives were satisfied with the improvement of the quality of care. This care model is also applicable in primary care settings to improve the quality of care for community dwelling elderly people. In these times of incredible visualisation possibilities you cannot sell a new care model on paper! To visualise the care process in a multidisciplinary integrated care approach we have made a professional movie with the funds of the vocational training institutes for family physicians and elderly care physicians led by the audiovisual centre of the VU. This movie has been made in one of the studied residential care homes with the co-operation of the residents and their relatives, staff, family physicians, elderly care physicians and psychologists. Besides for the main movie, you can also find a very nice instructional part for the use of inter RAI-LTCF. This fine movie can be seen at www.nedrai.nl.

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