

Outcomes of Integrated Community Care Interventions for Frail Elderly People: A Literature Review

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Abstract

This study aimed to summarize the outcome measures and the significant outcome of effective integrated community care for frail elderly people through a literature review. A literature search was conducted using the Cochrane Library and PubMed for articles published up to November 2016 with the following search terms: Integrated community care, primary care, community, frail elderly, and effectiveness. A total of 106 articles were identified, of which eight with an interventional research design the inclusion criteria. All outcome measures were classified into the three categories: Functional abilities, quality of life, and health. As the significant effect, the physical function was perceived in four references, the quality of life in one reference, and the mental health in one reference. The evidence of the effectiveness of integrated community care seemed to be lacking. More studies will need to be conducted.

Keywords

Integrated Community Care, Primary Care, Effectiveness, Frail Elderly, Global

1. Introduction

Japan faces the challenge of a super-aging society with the world's highest percentage of elderly people aged ≥ 65 years (27.3% in 2016), and the percentage is estimated to increase even further due to decreasing birth rates and increasing longevity [1]. Globally, the proportion of people aged ≥ 65 years is also on the rise, leading to a greater worldwide interest in and awareness of long-term home-based care [2]. Indeed, aging and super-aging populations have become

global concerns.

The possibility of requiring care increases with age, and frail elderly people aged ≥ 75 years who have complex acute and chronic medical problems, as well as functional disabilities, comprise a particularly vulnerable group. However, care for frail elderly people has been characterized as being fragmented and lacking overall responsibility and accountability, and associated with negative incentives [3]. Thus, an effective community care system including medical facilities needs to be developed for frail elderly people. In particular, effective community care for elderly people will require integration of medical care and caregiving based on multidisciplinary collaborations. Integrated health systems include community-based and community-focused services that are oriented toward primary health care and health promotion, and provide the basis for additional secondary and specialty services [4]. As such, effective primary health care including primary care will become a key element in developing effective integrated community care. Primary care, which refers to first-contact, continuous, comprehensive, coordinated, family-centered, and community-oriented care, regardless of gender, disease, or the affected organ system [5], will thus lead to improved community health. In 2008, the World Health Organization advocated that primary care systems be strengthened in all countries, urging the promotion of primary care as an approach to provide effective, fair, and efficient care [6].

In Japan, care needs among the elderly are expected to increase as baby boomers (born between 1947 and 1949) reach the age of 75 years or older in 2025. As we face social changes in the near future, Draft Act on Amendatory Law to the Related Acts for Securing Comprehensive Medical and Long-Term Care in the Community came into effect in 2014 [1]. The purpose of this law is to promote the integration of medical care and long-term care in community caregiving services. In order to provide uniform community services pertaining to housing, medical treatment, caregiving, prevention (including primary, secondary, and tertiary), and support in daily life across the country, the Japanese Ministry of Health, Labour and Welfare proposed that an integrated community care system be established in each community by 2025, considering the characteristics of the each community. This system will not only allow elderly people to continue living in their homes until the end of their lives, but also help to address many social issues including a further population decline associated with aging, decreasing proportions of children, changes in family composition, increasing single elderly individuals, aging of elderly caregivers, and prevalence of dementia in patients as well as their elderly caregivers. Among the academia in Japan, the need to develop a systematic community strategy for improving the quality of life (QOL) of the elderly has been suggested [7]. Particularly, QOL is the key goal for health promotion in older people [8].

Community care innovations for frail elderly people will be expected in order to prevent their worse health state, and thus, it will be important to construct an

effective integrated community care system focused on frail elderly people through an evaluation of their effectiveness. It is suggested that many frail older adults are seen by healthcare professionals in primary care, and that integrated care programs have been developed to enhance the quality of care in the setting [9]. In considering how effective integrated community care should be constructed for the frail elderly, evaluation items and outcomes of such care need to be clarified, and related findings be accumulated.

This study aimed to summarize the outcome measures of effective integrated community care for frail elderly people and to perceive the significant outcome of the effect in each research paper through a literature review of studies with an interventional research design.

2. Methods

An electronic search was performed using the Cochrane Library and PubMed for English articles published in peer-reviewed journals up to November 2016 with the following search terms: integrated community care, primary care, community, frail elderly, and effectiveness. In each database, the combinations of the search terms were two patterns as follows; 1) integrated community care and frail elderly and effectiveness; 2) primary care and community and frail elderly and effectiveness.

Identified articles were screened on the basis of title and abstract, and selected articles were subjected to full-text assessment and critical review according to the following inclusion criteria: studies in which a practice-based integrated community care intervention was performed for frail elderly people, with outcomes relating to the effect of integrated community care relevant to frail elderly people regardless of disease. Integrated community care was defined as community-based primary care based on an elderly-focused or elderly-centered model designed to meet the needs of frail elderly people.

Outcome measures were categorized through collecting the similar kind of elements which were used in the method of each research. And, significant effective measure was clarified based on the outcomes of each research paper.

3. Results

A total of 106 articles were identified by the electronic search, of which 22 were selected on the basis of title and abstract. Among these, eight articles met the inclusion criteria after a critical review of the full text and were included in the analysis (Figure 1).

Table 1 summarizes data extracted from the eight studies. Five studies were published in 2016, and the remaining three were published in 2004, 2008, and 2013. Except for one study conducted in Canada, studies were conducted in the Netherlands. Study locations were not described enough to identify the characteristics of the community. Four studies used a randomized controlled trial (RCT) design [10] [11] [12] [13], one used a non-RCT design [14], and three

Table 1. Overview of data extracted from the included studies.

Reference	Study Design	Participants	Aim	Study Location	Intervention and Control	Outcomes
Tourigny A, <i>et al.</i> , 2004	Quasi-experimental study (analyzed changes before intervention [T0] and every 12 months [T1, T2, T3] after intervention for a 3-year period)	482 frail elderly people aged ≥ 75 years and their caregivers from 2 semi-urban communities (272 elderly people and 135 caregivers in the experimental group; 210 and 129 in the control group)	To determine the impact of the Integrated Service Delivery (ISD) network on frail elderly people and their caregivers, and on the utilization of health and social services	Bois-Frances region in the Province of Quebec, Canada	ISD implemented study area versus no-ISD control area	<p>“Outcomes in frail elderly people”</p> <p>1) Positive effects on desire to be institutionalized in the first two years (T0 - T1: P = 0.002, T0-T2: P = 0.04)</p> <p>2) Positive effects on elderly people with mobility problems at T1 (P = 0.002) and T2 (P = 0.07)</p> <p>“Outcomes in caregivers”</p> <p>Positive effects on caregiver burden at T1 (P = 0.05) and T2 (P = 0.04)</p>
Melis R, <i>et al.</i> , 2008	Pseudocluster randomized controlled trial (RCT) (analyzed differences between Intervention and Control groups in changes from baseline in GARS-3 and MOS-20 MH at 3-month follow-up [T1 - T0])	151 vulnerable elderly people aged ≥ 70 years (85 participants in the DGIP group and 66 in the usual care group)	To describe the effects of the Duch Geriatric Intervention Program (DGIP) compared to usual care in improving health-related quality of life and promoting successful aging in independently living frail older patients	Nijmegen, The Netherlands	DGIP implemented group and usual care group	<p>“Primary outcome”</p> <p>1) Functional performance improved after 3 months of follow-up from baseline (95% CI = -4.2 to -0.3, p < 0.05)</p> <p>2) Mental well-being improved after 3 months of follow-up from baseline (95% CI = 0.1 to 11.4, p < 0.05)</p> <p>3) Mental well-being improved after 6 months of follow-up from baseline (95% CI = 2.4 to 15.6, p < 0.01)</p> <p>“Secondary outcomes”</p> <p>Negative affect domain of DQoL improved at 3 months (95% CI = -0.37 to -0.04, p < 0.05)</p>
Metzelthin S, <i>et al.</i> , 2013	Cluster RCT (analyzed differences at baseline and at 6-, 12-, and 24-month follow-up)	346 frail elderly people (Groningen Frailty Indicator scores ≥ 5) aged ≥ 70 years in 12 general practices (193 in the intervention group [6 practices] and 153 in the control group)	To investigate the effectiveness of the Prevention of Care (PoC) approach on various patient-level outcomes compared with usual care	Sittard, The Netherlands	PoC implemented group and usual care group	<p>“Primary outcome”</p> <p>No significant group by time interaction effects for the Groningen Activity Restriction Scale scores or for activities of daily living and instrumental activities of daily living subscale scores</p> <p>“Secondary outcomes”</p> <p>No significant effects on depressive symptomatology, social support interactions, fear of falling, and social participation</p>

Continued

Bleijenberg N, <i>et al.</i> , 2016	Single-blind, three-arm, cluster RCT (analyzed differences at baseline and at 6- and 12-month follow-up)	3092 community-dwelling frail people aged ≥ 60 years (790 participants in the screening arm, 1446 in the screening + nurse-led care arm, and 856 in the usual care arm)	To evaluate the effectiveness of the Utrechr PRO active Frailty Intervention Trial (U-PROFIT) in preserving daily functioning of frail older adults in primary care	Utrecht, The Netherlands	Intervention arm 1: Frailty screening followed by routine care from a general practitioner Intervention arm 2: Frailty screening followed by personalized nurse-led care Control arm	<p>“Primary outcome”</p> <p>1) No differences in mean Katz-15 scores among the three groups after 6 months</p> <p>2) Less decline in daily functioning in both intervention groups compared to the control group (95% CI = 1.77 to 1.97, P = 0.03) after 12 months</p> <p>3) Significantly better preservation of daily functioning in more highly educated participants in the screening and nurse-led care group compared to all participants in the screening and control groups (95% CI = 1.80 to 1.96, P = 0.03)</p> <p>“Secondary outcomes”</p> <p>1) No significant differences among the three groups with respect to quality of life and satisfaction with care at 6- or 12-month follow-up</p> <p>2) No significant differences in the number of hospital admissions, number of emergency department visits, or mortality</p>
Dijk H, <i>et al.</i> , 2016	Matched quasi-experimental study (analyzed differences at baseline and at 6- and 12-month follow-up)	392 community-dwelling frail older people aged ≥ 70 years (186 in the intervention group and 186 in the control group)	To evaluate the effects of Integrated Neighborhood Approaches (INAs) on health-related quality of life and well-being in frail older people	Rotterdam, The Netherlands	INAs implemented group and “usual” care and support group	No substantial differences in well-being or health related quality of life between the intervention and control groups at 1 year.

Continued

Hoogendijk E, <i>et al.</i> , 2016	24-month stepped wedge cluster RCT (analyzed differences between allocation groups at baseline and at every six months)	1147 community-dwelling older adults aged ≥ 65 years (456 in group 1, 227 in group 2, 238 in group 3, and 226 in group 4)	To evaluate the impact of the Geriatric Care Model (GCM) on quality of life and several other patient outcomes	Amsterdam and West-Driesland, The Netherlands	Group 1: 6 months after initiation of GCM intervention and usual care (baseline) Group 2: 12 months after initiation of GCM intervention and usual care (baseline and 6 months) Group 3: 18 months after initiation of GCM intervention and usual care (baseline, 6 and 12 months) Group 4: 24 months after initiation of GCM intervention and usual care (baseline, 6 months, 12 months and 18 months)	“Primary outcome” No significant differences between the GCM and usual care groups in SF-12. “Secondary outcomes” Significant intervention effect on IADL limitations in patients who received the intervention for 18 months ($B = -0.25$, 95% CI = -0.43 to -0.06 , $P = 0.007$). However, this effect was not significant after correcting for multiple comparisons No significant intervention effects on EuroQoL, ADL limitations, psychological well-being, self-rated health, and social functioning No significant effects on total and acute hospital admissions
Looman W, <i>et al.</i> , 2016	Quasi-experimental study (analyzed differences at baseline and at 3- and 12-month follow-up)	503 frail older participants aged ≥ 75 years (254 in the experimental group and 249 in the control group)	To explore the effectiveness of the Walcheren Integrated Care Model (WICM) by evaluating the effects on health outcomes (experimental health, mental health, social functioning), functional abilities, and quality of life (general, health-related, and well-being) in community-dwelling frail older people	Rotterdam, The Netherlands	WICM implemented group and usual care group	Moderate significant effect on quality of life after 12 months (95% CI = -0.15 to 5.63 , $p < 0.10$) No effects on health related quality of life or well-being, although WICM impacted one dimension of well-being; the ability to receive love and friendship (95% CI = 0.14 to 0.36 , $p < 0.001$). No significant differences between the groups in terms of experienced health, mental health, and social functioning
Ruikes F, <i>et al.</i> , 2016	Two-arm cluster non-RCT (analyzed differences at baseline and at 12-month follow-up)	536 community-dwelling frail elderly people aged ≥ 70 years (287 in the intervention group and 249 in the control group)	To evaluate the effectiveness of a general practitioner-led extensive, multicomponent program (CareWell primary care program) integrating cure, care, and welfare for the prevention of functional decline	Nijmegen, The Netherlands	CareWell Primary Care implemented group and usual care group	“Primary outcome” No significant differences between groups in independence in functioning during activities of daily living “Secondary outcomes” No significant differences between groups in quality of life, institutionalization, hospitalization, and mortality

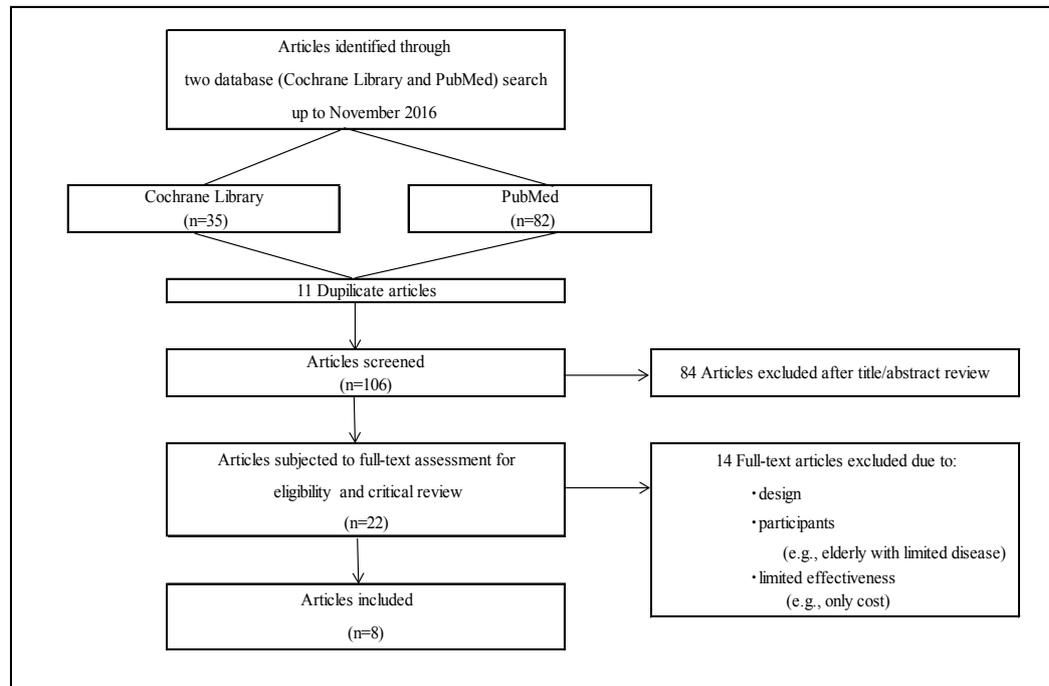


Figure 1. Flowchart of literature search.

used a quasi-experimental design [15] [16] [17]. In general, interventions were described thoroughly enough to allow for judgement as to whether they could be characterized as “integrated community care” or not. On the other hand, descriptions of the control group (often referred to as “usual care”) generally lacked details, and differences between “integrated community care” and “other care” were unclear. The length of follow-up from baseline in these studies ranged from 3 to 36 months.

The number of participants in each study ranged from 151 to 3,092. Participants were problem-based elderly populations in all studies, and the criteria of frail individuals were described in seven studies [10] [11] [12] [13] [14] [16] [17]. One study [15] examined both frail elderly people and their caregivers. The age of participants was ≥ 70 years in four studies [10] [11] [14] [16], ≥ 75 years in two studies [15] [17], and ≥ 65 years and ≥ 60 years in the remain two studies [12] [13].

Outcome measures for the effectiveness of the integrated community care were classified into the following three categories: “functional abilities”, “quality of life (QOL)”, and “health”. And, the statistical significant outcome of the effective integrated community care for frail elderly was perceived in each reference (Table 2).

3.1. Functional Abilities

Functional abilities included two elements: physical function and social function. The physical function was perceived as the significant effect in four references (Table 2).

Table 2. Overview of the outcome of effective integrated community care for frail elderly.

Reference	Outcome Measure	Functional Ability		QOL	Health	
		Physical Function	Social Function		Physical Health	Mental Health
Tourigny A, <i>et al.</i> , 2004		S				
Melis R, <i>et al.</i> , 2008		S		S		S
Metzelthin S, <i>et al.</i> , 2013		NS	NS			
Bleijenberg N, <i>et al.</i> , 2016		S		NS	NS	
Dijk H, <i>et al.</i> , 2016		NS		NS		NS
Hoogendijk E, <i>et al.</i> , 2016		S		NS	NS	NS
Looman W, <i>et al.</i> , 2016		NS	NS	NS	NS	NS
Ruikes F, <i>et al.</i> , 2016		NS		NS	NS	

Note. S=Significant, NS=Not Significant.

Physical function was defined as function during activities of daily living, mobility, or ability to perform instrumental activities of daily living (IADL). Physical function was used as an outcome measure in all studies, and in which primary outcome was four [10] [11] [12] [14] and secondary outcome was one [17].

Effects on physical function were observed in four studies [10] [12] [13] [15]. Tourigny *et al.* [15] reported that a significant positive effect was observed in elderly people with mobility problems at 12 ($P = 0.002$) and 24 ($P = 0.04$) months post-intervention in a quasi-experimental study. Melis *et al.* [10] observed significantly improved functional abilities (primary outcome) in the intervention group after three months in a pseudocluster RCT (95% confidence interval [CI] = -4.2 to -0.3 , $p < 0.05$). Bleijenberg *et al.* [12] reported that the intervention group had significantly less decline in daily functioning (primary outcome) compared to the control group (95% CI = 1.77 to 1.97 , $P = 0.03$) after 12 months in a cluster RCT. Hoogendijk *et al.* [13] reported that a significant intervention effect on IADL limitations was observed in frail elderly people who received the intervention for 18 months (95% CI = -0.43 to -0.06 , $P = 0.007$) in a stepped wedge cluster RCT. However, Metzelthin *et al.* [11] and Ruikes *et al.* [14] reported no significant changes in physical function.

Social function, or social participation in two studies [11] [17] was reported to show no significant changes.

3.2. QOL

Six studies [10] [12] [13] [14] [16] [17] used QOL as an outcome measure. The QOL was perceived as the significant effect in one reference (Table 2).

Although QOL was the primary outcome in one [13] of the six studies, no significant positive change was reported. Another study [10] measured QOL as a secondary outcome and reported a significant effect after three months, relative to baseline (95% CI = -0.37 to -0.04 , $p < 0.05$). Other studies [12] [14] [16] [17] found no significant effect on QOL.

3.3. Health

Health included both physical and mental elements. The mental health was perceived as the significant effect in one reference (**Table 2**).

Physical health was related to hospitalization, mortality, hospital admission, or number of emergency department visits. Four studies [12] [13] [14] [17] used physical health as an outcome measure. However, none of these studies reported significant effects of the interventions on physical health.

Mental health reflected mental well-being or psychological well-being. Among four studies [10] [13] [16] [17] that used mental health as an outcome measure, one study [10] assessed mental well-being as the primary outcome and reported that a significant improvement was observed in the intervention group after three (95% CI = 0.1 to 11.4, $p < 0.05$) and six (95% CI = 2.4 to 15.6, $p < 0.01$) months of intervention in a pseudocluster RCT. The other three studies [13] [16] [17] reported no significant effects on mental health.

4. Discussion

The Japanese government is currently promoting the construction of an integrated community care system in each community by 2025 in order to address changes associated with the increasing elderly population and decreasing birth rates. It is important to consider how an effective integrated community care system should be constructed, and what aspects of evaluation need to be focused on. In the present study, a literature review of eight interventional studies was carried out with the aim of summarizing the outcome measures and the significant outcome of effective integrated community care for frail elderly people in each research paper.

In the eight research papers, except for one study conducted in Canada, studies were conducted in the Netherlands. It is said that in the Netherlands, strong primary care system is constructed and that there are various integrated care models in communities. It is suggested that the Netherlands was the highest volume publisher per 10,000 researchers from primary care, followed the United Kingdom, and that the Netherlands seem to rapidly increase its productivity in primary care research [18]. Therefore, it seemed that the most of the eight research papers might be in the Netherlands.

Among the three categories of outcome measures (functional abilities, QOL, and health), integrated community care seemed to be effective in improving functional abilities of frail elderly people. In particular, positive effects on physical function have been reported although social function was reported to show no significant change. QOL as an outcome measure was used in six studies and positive significant effect was showed in one study [10]. Physical health as an outcome measure was used in four studies [12] [13] [14] [17] and mental health was used in four studies [10] [13] [16] [17]. But, the significant improvement in the mental health was showed in one study [10].

In one study [10], integrated community care had significant effects on all of

the three categories of outcome measures; physical function, mental health, and dementia QOL (DQoL), although only the “negative affect” domain of DQoL showed significant improvement. Moreover, although an effect on mental health was observed after three and six months relative to baseline, the effects on physical function and DQoL were significant only after three months in that study.

Through the literature review in the present study, the evidence for the effectiveness of the integrated community care for the frail elderly seemed to be lacking. It is said that critical evaluation of the available evidence is difficult due to the heterogeneity of so-called “community intervention models” [10]. Indeed, “community” is a diverse concept. On the other hand, aging and super-aging populations are global concerns. Therefore, it will be important to explore how to construct an effective integrated community care system focused on the elderly people considering an evaluation of their effectiveness worldwide. Through the present study, it was suggested that studies pertaining to effective integrated community care were published relatively recently, with roughly 62% of identified research papers published in 2016. It seemed to be recent. Further studies will need to be conducted.

In the further studies, it may be better that the inclusion criteria of the frail elderly in the baseline may be set up clearer enough to perceive the positive effects of intervention in a longer study period. And, about the outcome measure of effective integrated community care for frail elderly, it was seemed that social aspect such as social function or social participation need to be more focused on, considering the character of community environments such as urban or rural. It is suggested that non-medical solutions such as social care, community services and the voluntary sector should have a larger role within integrated care programs [9]. The eight research papers in the present study primarily involved interventions carried out by healthcare professionals. The research design which several interventions are compared within the same study will need to be considered in order to find effective combinations of components of integrated community care for the frail elderly. And also, it will be more important to pile the research data globally and perform meta analysis.

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Conflicts of Interest

None declared.

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