European Geriatric Medicine 7 (2016) 571–580

Available online at
ScienceDirect
www.sciencedirect.com

Elsevier Masson France
EM|consulte
www.em-consulte.com/en

Research paper

Effects of preventive home visits on older people's use and costs of health care services: A systematic review

H. Liimatta [a,b,*], P. Lampela [c], P. Laitinen-Parkkonen [d], K.H. Pitkala [b]

[a] Hyvinkää City Health Center, Jussilankatu 6, 05880 Hyvinkää, Finland
[b] University of Helsinki, Department of General Practice and Primary Health Care and Helsinki University Hospital, Unit of Primary Health Care, Helsinki, Finland
[c] Hyvinkää City Health Center, Sairaalankatu 3, 05800 Hyvinkää, Finland
[d] City of Hyvinkää PL 86, 05801 Hyvinkää, Finland

ARTICLE INFO

Article history:
Received 14 June 2016
Accepted 21 August 2016
Available online 23 September 2016

Keywords:
Preventive home visit
Aged
Randomized controlled trial
Use of health care services
Cost-effectiveness

ABSTRACT

Introduction: The aim of this study was to systematically review the evidence from randomized controlled trials (RCT) concerning effectiveness of preventive home visit (PHV) programs on older people's use and costs of health and social services. We also evaluated resultant costs-changes achieved with intervention in older people's functioning, quality-of-life (QOL) or mortality.
Materials and methods: A systematic review of published RCTs reporting use and/or costs on PHVs on multimorbid older people was performed. The characteristics and methodological quality of studies were assessed.
Results: Of the 3219 articles screened, 19 met the inclusion criteria. The methodological quality of the trials was principally moderate ($n = 5$) or good ($n = 10$). Of the studies, 12 evaluated the overall costs of health and social services. None of these studies was able to show significant differences in total costs between intervention and control groups. Six studies suggested that PHVs may decrease nursing home admissions and/or hospital days. Seven studies showed some favorable effect on physical functioning, QOL, or mortality, without increasing the total health care costs.
Conclusions: Of the high number of studies investigating efficacy of PHVs on older people, only a few studies explore economic effects. PHVs do not provide overall savings to health care costs, but some interventions might offer some cost-neutral positive effects on functioning, QOL and/or mortality. More studies are needed to clarify the effective aspects of the programs and cost-effectiveness of the PHVs.

1. Introduction

An ageing population warrants the development of effective preventive interventions to support autonomy and well-being of older people. Preventive home visits have been developed with the aim of improving and maintaining the health and functioning of older people [1]. From the societal perspective they are also intended to reduce hospital and nursing home admissions and to lower the associated health care costs [2,3]. Over the past two decades, there has been an increasing interest in developing preventive home visit programs. A large number of studies have been conducted, especially in Europe, North America, and Japan, and several systematic reviews on these programs have explored their efficacy [1–6]. The findings have varied across national systems and settings [7].

The effects of the home visiting programs remain controversial [6,8]. Some studies have shown improvements in well-being and slower decline in functioning among those receiving home visit intervention compared with their controls [1] but some have suggested no effects of preventive home visits [6]. Whereas the earlier systematic reviews showed positive effects on functioning [4,5], admissions to institutional care [2,3,5], and mortality [1,2,5], the later reviews suggest less favorable effects [6,8]. There is a heterogeneity in the interventions which have often been poorly described [6]. In addition, the methodological quality of the trials has varied [3,8]. Furthermore, these reviews have been inconsistent in how they have included previous randomized, controlled trials.

Several trials have also focused on the effects of preventive home visits on the use of services [1,6,8]. To our knowledge, only two reviews have investigated cost-effectiveness of preventive

* Corresponding author at: Tuulikinpolku 15, 11120 Riihimäki, Finland. Tel.: +358 40 755 4183.
E-mail addresses: heini.liimatta@gmail.com, heini.liimatta@hyvinkaa.fi (H. Liimatta), pekka.lampela@hyvinkaa.fi (P. Lampela), pirjo.laitinen-parkkonen@hyvinkaa.fi (P. Laitinen-Parkkonen), kaisu.pitkala@helsinki.fi (K.H. Pitkala).

http://dx.doi.org/10.1016/j.eurger.2016.08.006
1878-7649/

home visits. One of them was limited to studies that were undertaken in Great Britain [9]. The other one focused only on fall prevention studies [10].

The aim of this systematic review is to examine the effects of home visiting programs on older people's (aged 65+) use and costs of health and social services. We included all randomized, controlled trials comparing the differences in the use of hospitals, social, and health care services, as well as nursing home admissions between the participants receiving intervention compared to their controls. From these studies, we also retrieved other outcomes such as functioning, quality-of-life (QOL), and mortality to assess what can be achieved with the input of money invested in home visits.

2. Methods

2.1. Search strategy

PubMed, Ovid Medline, Cochrane Database, DARE, and Cinahl were systematically searched for randomized controlled trials (RCTs) using terms related to home visits for older people and economic analysis. We used the following terms: [(preventive OR prevention) AND (home care OR home nursing OR house calls OR home visit)] AND aged [MeSH Terms] AND (cost-effectiveness OR economic OR cost-benefit analysis OR costs and cost analysis OR health care costs OR hospital admissions OR nursing home admissions) in all fields. In databases where aged [MeSH Term] search was not possible, search terms (aged OR elderly OR older people OR old) were used. The search process ended in May 2015 and was repeated in February 2016. Reference lists from earlier papers, and reviews were manually searched for additional studies. No language restrictions were imposed.

We included RCTs examining the effects of the preventive home visiting programs on community-dwelling older people's (aged 65+) use and/or costs of health care and social services. We included both those studies that had an economic analysis performed on the data and the studies that had reported data on differences in hospital days and/or nursing home admissions or use of various health and social services.

Preventive home visits are defined as visits to community-dwelling older people, which aim for multidimensional medical, functional, psychosocial, and/or environmental evaluation of their problems and resources [3–5,8]. Based on the definition of preventive home visits, studies that evaluated follow-up home visits directly related to recent hospital discharge, as well as studies in which the intervention was exclusively targeted to fall prevention or cognitive-function, were excluded. Since we focused on older people, many of whom suffer from multiple health problems, studies, which were targeted at people with one specific disease or diagnosis were excluded.

2.2. Methodological quality

Two reviewers (H.L. and P.L.) independently evaluated the included studies according to ten criteria of methodological quality. Disagreements were taken to third reviewer (K.P.) and discussed between the reviewers until a consensus was reached. We used a modified rating system for evaluation. In this rating system, we applied the criteria for randomized intervention trials used by Cochrane and collaborators [11] and Joanna Briggs Institute MAStARI critical appraisal tool [12]. In addition, we included the criteria developed by the Evidence-Based Medicine Working Group [13,14]. The criteria are described in Table 1. Each criterion was considered to be worth 1 point. Each item was scored '+' if the criterion was fulfilled, '−' if the criterion was not fulfilled,

Table 1
Evaluation of the quality criteria fulfillment in randomized controlled trials (RCT) examining the effects of preventive home visits on older people's use and costs of health care services.

Study	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	Total
Hendriksen et al., 1984 [30]	±	+	+	−	+	±	±	?	+	?	4
Vetter et al., 1984 [15]	+	+	+	−	+	+	±	−	+	−	6
Pathy et al., 1992 [16]	−	+	±	−	+	±	−	+	+	?	4
van Rossum et al., 1993 [17]	+	+	+	+	+	+	+	+	+	±	9
Stuck et al., 1995 [18]	+	+	+	+	+	+	+	+	+	?	9
Dalby et al., 2000 [31]	+	+	−	+	+	±	±	±	+	±	5
Stuck et al., 2000 [19]	+	+	+	−	±	+	+	+	+	?	7
Hebert et al., 2001 [32]	±	+	+	±	+	+	−	+	+	+	7
Schraeder et al., 2001 [26]	+	−	+	−	+	+	−	+	+	+	7
Bouman et al., 2008 [20]	+	+	+	+	+	+	+	+	+	?	9
Melis et al., 2008 [21]	+	+	−	+	+	+	+	+	+	+	9
Sahlen et al., 2008 [22]	+	±	+	±	+	+	?	?	?	?	4
van Hout et al., 2010 [24]	+	+	+	+	+	+	+	+	+	?	9
Ploeg et al., 2010 [23]	+	+	+	+	+	+	±	±	+	+	8
Frese et al., 2012 [25]	+	±	+	?	+	+	−	−	±	?	4
Kono et al., 2013 [7]	+	+	+	+	+	+	+	+	+	+	10
Brettschneider et al., 2015 [27]	+	+	+	+	+	+	±	−	+	+	8
Fairhall et al., 2015 [28]	+	+	+	+	+	+	+	+	+	+	10
Metzelthin et al., 2015 [29]	+	±	+	+	+	+	−	+	+	+	8

(1) Inclusion and exclusion criteria are satisfactorily described.
(2) Groups are comparable at baseline.
(3) The study has sufficient statistical power to detect an effect and there was a strength calculation.
(4) The randomization method is adequately described and the assignment to treatment groups was truly random.
(5) The measurements and outcome measures are valid and well defined.
(6) The intervention is adequately described.
(7) The dropouts are described and the analyses take them into account.
(8) Intention to treat analysis is applied.
(9) A comparison is made in relation to outcome variables between the groups.
(10) The group assignment is blinded when assessing the outcomes.
+: criterion fulfilled (1 point); −: criterion not fulfilled; ±: criterion partly fulfilled;?: unclear.
High quality: 8–10; moderate quality: 5–7; poor quality: < 5 points.