Determinants of home-based formal help in community-dwelling older people in Finland

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Abstract Knowledge of the determinants of use of formal home-based services among older people is of particular importance for predicting the need for and cost of care in the future. The aim of this study was to estimate the frequency of formal and informal help among community-dwelling older people and to assess the determinants of home-based formal help, with a special emphasis on the frequency of help from spouse, from children and other relatives and friends. We used nationally representative cross-sectional data from 1,166 community-dwelling Finnish persons aged 70–99. Determinants of formal help were assessed with logistic regression models. Receiving formal help was most strongly related to need factors such as age and functional capacity. Adjusted for need factors, receiving help from spouse or living with someone else than the spouse decreased the odds of receiving formal help. In contrast, the more frequently the children helped, the larger were the odds of receiving formal home-based help. Help from other informal sources did not affect receipt of formal help. Our results thus suggest that intra-household help from spouse or from other co-residents may partly offset expected cost increases in the formal care sector brought about by an aging population. The results further suggest that help from children and help from formal sources is likely to be concomitant and that children may act as agents seeking formal help

also in a welfare state based on the universal and equal care services.

Keywords Formal help · Informal help · Formal care · Informal care · Older people · Finland

Introduction

It is well acknowledged that with a rapid population aging, organizing care for older people in developed societies will meet severe challenges in the future. To prevent and delay costly institutional placement, health-care policies in many countries strongly promote independent living in the community for as long as possible. Coping at home often requires home-based care arrangements and services organized by the public sector such as home help services and home nursing. Considering the growing burden of providing care for older people, knowledge of the determinants of the use of formal public services is of particular importance for predicting the need for and cost of services in the future.

Several factors have been found to be associated with use of formal care, functional capacity and health status being among the most important determinants. Other factors include, for example, age, gender, education, income, population density or level of urbanization and access to care (e.g. Branch and Jette 1983; Kemper 1992; Larsson and Thorslund 2002; Kadushin 2004; Van Houtven and Norton 2004; Geerlings et al. 2005; Broese van Groenou et al. 2006). In addition to the abovementioned determinants, one of the most important factors in predicting use of formal help is receipt of help from informal sources (Bass and Noelker 1987; Kemper 1992). Many elders rely on informal help from their social networks such as their

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spouse, children and their spouses, other relatives, friends and neighbors. The volume of informal help has been found to be much larger than formal help, for example, in the USA (Whitlatch and Noelker 1996; Davey et al. 2005), in Great Britain (Davey and Patsios 1999) as well as in Scandinavian welfare states with strong publicly funded health-care systems (Hellström and Hallberg 2001; Larsson and Thorslund 2002; Nordberg et al. 2005).

The receipt of informal help is strongly dependent on a person's living arrangements, the existence of a spouse and children and the availability of other relatives, friends and neighbors. Empirical evidence has shown that living with someone (most often with the spouse), rather than marital status as such, has been found to reduce the use of formal services, and living alone predicts higher use of services (Bowling et al. 1991; Cafferata 1987; Tennstedt et al. 1990). Having no children has been found to increase the probability of using public home help services and the number of hours of formal care among the home-dwelling older people (Lafreniere et al. 2003; Larsson and Silverstein 2004), although there is also conflicting evidence on the role of children: Choi (1994) found that childless older persons did not differ from those having children in use of services. Less research has been undertaken on the effects of receiving help from other specified sources of informal help, such as other relatives, friends and neighbors, and the evidence presented to date is mixed. Choi (1994) found that having friends decreased the use of social services but that the number of siblings, or having relatives, had no effect on service use. According to the results of Larsson and Silverstein (2004), frequent contacts with friends were associated with the lesser use of formal care. In contrast, Logan and Spitze (1994) found that receiving help from friends was positively associated with the use of services, but their study also found that help from other relatives or neighbors was of no importance. Stoddart et al. (2002) found no effects of social support on service use.

Even though the major importance of family and other informal sources in providing help has been acknowledged, it is still largely unclear through which mechanisms help from these sources affects use of formal home-based services. The focal point of this debate is whether these two types of help act as substitutes, i.e., whether receiving formal help reduces supply and use of informal help or vice versa. Some studies take the stand for the substitution hypothesis (e.g., Cafferata 1987; Kemper 1992; Tennstedt et al. 1993b; Van Houtven and Norton 2004). Others have argued that informal and formal help are rather complements than substitutes to each other: they may occur simultaneously and answer to different needs, use of both types of help increasing with deteriorating health (e.g., Chappell 1985; Davey and Patsios 1999; Davey et al. 2005;

Langa et al. 2001; Penning 2002; Motel-Klingebiel et al. 2005).

Despite the vivid debate on substitution versus complementarity, these two hypotheses on the interplay between informal and formal help are not necessarily contradictory and both may occur at the same time. There may be processes of substitution going on in the society in time, and also at the individual level with people relying on formal help when informal help is not available. However, among those with more severe disabilities informal and formal help are more likely to be complementary when needs exceed the resources of the informal networks (Stoller and Cutler 1993; Tennstedt et al. 1993b; Van Houtven and Norton 2004; Sundström et al. 2006; Broese van Groenou et al. 2006). A mechanism proposed between informal and formal help is the process of "bridging" where informal carers act as advocates in acquiring formal help (Sussman 1976; Geerlings et al. 2005). This mechanism may be involved in situations of complementarity (additional formal help is sought for when increasing needs exceed the resources of the informal network) but also in processes of substitution (informal carers cease to provide help when formal help is acquired).

The Nordic welfare model forms the basis to the Finnish social protection system with comprehensive social and health services characterized by the principle of equality and universality of benefits. The proportion of elders receiving formal home help services was estimated to be 12% in Finland in 1996, whereas it was only 6% in England (Rostgaard and Fridberg 1998). Family members are not legally obliged to provide care or to pay for formal care. Co-residence with adult children is rather uncommon and living alone common among Finnish older people: the proportion of those living alone among those aged 70 or over in 2001 was 44% (population statistics in <http://epp.eurostat.ec.europa.eu>). Access to public home care is determined by need but not means tested and should not be affected by the possibilities of obtaining informal help. However, since domiciliary services are organized by the municipalities, the provision of care may vary according to the balance between demand of care and available resources in different municipalities. A more detailed description of the Finnish home-care system can be found in Hammar et al. (2008).

The aim of public elderly care in Finland is to support older people at home for as long as possible. Considering this aim, developing incentives to increase informal home-based care for older people has been one of the focus areas. Informal care allowance may be allocated to those taking care of a relative or a close person needing care and living at home. However, the low level of the financial allowance (the average amount paid was 416 euros per month in 2006) and difficulty to get temporary care help are among

the main problems of the system (Finnish Social Protection 2003; Niemelä and Salminen 2003; Voutilainen et al. 2007).

In order to ensure efficient care arrangements in the future, more evidence is needed on the interplay between the availability and extent of informal help and use of formal help services in aging populations. The first aim of this study was to chart the care mix among community-dwelling older people in a welfare state with strong emphasis on publicly financed services. Our second aim was to assess the effects of different factors such as cognitive and physical ability, social status and availability of informal help on receipt of formal home-based help. To probe these issues, we used nationally representative population-based cross-sectional data on the community-dwelling population aged 70–99 in Finland. As substitution and complementarity of different types of help with increasing needs are dynamic processes in time they cannot be analyzed properly with cross-sectional data (Sundström et al. 2006). Rather, our emphasis was put on the effects of the frequency of informal help from different sources on use of formal help, adjusting for other determinants. As an extension to previous studies, we assess simultaneously the effects of the frequency of help from the spouse, from children and other informal networks. Our strategy to include all older persons in the population, not only dependent persons or home care clients, allows us to produce population-level estimates of formal care use and its determinants.

Methods

Data

Sample definitions

The data were derived from the Health 2000 health examination survey, which was completed in 2000–2001 in Finland and is representative of the Finnish population aged 18 and over. The study consisted of a home interview, a health examination at a health center and additional surveys on specific topics. The sample was constructed using a two-stage cluster sampling design. During the first stage, the country was regionally stratified according to the five university hospital regions, each consisting of roughly one million inhabitants. From within these hospital regions, a total of 80 health-care districts (including 160 municipalities) were sampled as clusters so that the 15 largest health center districts were all selected and the remaining 65 were sampled with systematic probability proportional to size (PPS) sampling in each stratum. These 80 health center districts were the primary sampling units. In the second stage, people were selected from the health center districts

using systematic sampling (Aromaa and Koskinen 2004). Persons aged 80 years and over were over sampled by doubling their sampling fraction to ensure that enough observations could be included in the data (Laiho et al. 2005). The observations were weighted to reduce the bias due to non-response and to correct for the over sampling of those aged 80 and older (Djerf et al. 2005). This study focused on those aged 70 and over, of whom the sample included 1,656. A total of 1,387 of them (84%) participated in the home interview. Those not living in private homes ($N = 219$) and those who had missing information on the question of receipt of help ($N = 2$) were not included. After these exclusions, the data included 1,166 persons aged 70 and over. 24 of these were proxy interviews, and confirmatory analyses showed that results were similar whether proxy respondents were included in the analyses or not.

Measures of help

Receipt of assistance with activities of daily living was asked with the following question: “Do you receive recurrent help in your normal tasks because of limitations in your functional capacity, such as help with housework tasks, bathing or showering, or shopping?” The sources of help as well as the frequency of help from each source were also inquired. Help received from the spouse, from children and their spouses and from friends, neighbors, other relatives and acquaintance was defined as informal help. Formal help was defined as help received from home help and home aid workers and visiting nurses. Thus, in this study, formal help is help provided by the public authorities. Some help from other sources than informal networks or public authorities was also reported, such as paid help and help from volunteering organizations. The frequency of help from each source was classified into four categories: receives no help; receives help less often than weekly; weekly or a few times a week; daily or more often. There was no question on the frequency of all informal or all formal help. We estimated these to be the same as the frequency of help from the source who gave the subject help most frequently. This may somewhat underestimate the total frequency of informal or formal help, but the data did not allow more detailed calculations. However, there was a question on the frequency of total help received, and comparing this information with the frequency of total help estimated similarly as described above showed that the percentages were similar, with about one percentage point deviations only.

Gender and age

Gender and age were adjusted for in multivariate analyses. Age was classified into 5-year age bands: 70–74, 75–79, 80–84 and 85+.

Functional ability

Cognitive ability, mobility and limitations in personal activities of daily living (PADL) and instrumental activities of daily living (IADL) represent the need factors among the determinants of formal help. The measure of cognitive ability was based on the Mini-Mental State Examination (Folstein et al. 1975) of which the survey questionnaire included a short version with a maximum of 16 points, near identical to that used by Magaziner et al. (1987). The test was performed to assess different aspects of cognitive functioning and included simple calculation and memory tasks. The exact contents of the test of cognitive capacity can be found in the Health 2000 home interview form at <http://www.ktl.fi/health2000/index.uk.html>. Those receiving at most 6 points were classified as having poor cognitive ability, those receiving 7–9 points as fairly poor, those receiving 10–12 points as fairly good and those receiving at least 13 points as good cognitive ability. Mobility limitations were measured with the question “How well can you move about?” Those being able to move about alone but with some difficulties were classified as having some limitations, and those being able to move about only when helped or unable to move about at all were classified as having severe limitations. The amount of PADL limitations was based on the five established ADL items: eating, getting to bed and getting up, dressing and undressing, showering or bathing and using the toilet. The total number of PADL limitations was classified into having no problems, having problems in one to two activities and having problems in three to five activities. The measure of IADL limitations was based similarly on information on using the telephone, preparing meals, shopping and handling finances in banks, offices and other similar institutions. The summary measure of IADL limitations was classified into having no problems, having problems in one to two activities and having problems in three to four activities.

Socioeconomic characteristics

Three levels of education were defined based on the highest degree-level obtained: lower basic level, upper basic level (corresponding to roughly 9 years of schooling) and more than upper basic level. Income was measured as equivalized income that was derived as the annual household income divided by the OECD equivalence scale (OECD 1982). This scale attributes the value of 1 to the first adult in the household, value 0.7 to other adults, and value 0.5 to children under 18. Equivalized yearly income ranged from 0 to 298,724 euros. Income was classified into quartiles, with the cut-off points (6,130, 8,574 and 11,080 euros) calculated from within the study population.

Type of municipality

We classified the municipalities into ten largest cities, other urban or densely populated municipalities and rural municipalities.¹ The type of municipality was included since it may be associated with the availability and provision of formal help (Care and Services for Older People 2002) and may also reflect cultural differences between rural and urban municipalities in taking care of older people.

Living arrangements

Living arrangements were classified into those living alone, living with their spouse and living with one or more other people than the spouse. Spouses include both married and cohabiting spouses, and those living with their spouse may have had also other co-residents in the household. Among those living with others, about 60% lived with their children. We did not separate this class into those living with children and those living with others than children due to the relatively small size of this group.

Statistical methods

The analyses were performed with Stata 8 statistical software survey estimation commands. First, we calculated weighted estimates of receipt of help from different sources. Second, to assess the simultaneous effects of the different determinants on formal help, we ran logistic regression models with receipt of formal help as the dependent variable. The results are presented as odds ratios (OR) with their 95% confidence intervals, the first category of each independent variable being the reference category.

Results

Sources of help and frequency of help from each source among women and men are shown in Table 1. Forty percent of women and 26% of men received help from any source, of which the majority was informal. Children and their spouses were the most important sources of help for both genders. Also, spousal help was generally important

¹ According to the definition of Statistics Finland, urban municipalities are those where at least 90% of the population live in densely populated communities (groups of buildings with at least 200 inhabitants, where the distance of the buildings is normally not more than 200 m), or the population of the largest community is at least 15,000. Densely populated municipalities are those where 60–90% of the population live in densely populated communities and the population of the largest community is at least 4,000 but at most 15,000. The rest are rural municipalities (<http://www.stat.fi>).

among men but less important among women of whom relatively few have a spouse in this age group. However, because of the larger numbers of older women, the absolute numbers of women and men receiving spousal care are approximately equal. Among those who had a spouse, a larger proportion of women than men received spousal help. Sixteen percent of women and 10% of men received formal home-based help.

Table 2 presents the distributions of the independent variables as well as the care mix. We distinguished those receiving only public formal help, those receiving both formal help and other type of help (mainly informal help), those receiving only other than formal help and those receiving no help. The percentages are adjusted for age. In these as in further analyses, the samples of women and men were combined to achieve more statistical power in the analyses.

The proportion of those receiving only formal public help was small, only 3%. Formal help was most often received in combination with other types of help—almost

80% of all formal help recipients relied on both formal help and help from other sources.

Adjusting for age had only a minor effect on the proportions of women and men receiving no help, which can be seen comparing Tables 1 and 2. Receipt of formal help (public formal help only or in combination with informal and/or other type of help) increased with age, with decreasing cognitive ability and with increasing limitations in mobility and PADL and IADL activities. Also receipt of other than formal help, which was mainly informal help, increased with these factors. Notably, the larger the need of help (indicated by age and PADL, IADL and mobility problems), the more likely the recipients were to receive both formal and informal help.

Compared with those having higher education, those with lowest education received more formal help in combination with other type of help. No clear pattern according to income quartiles was visible, even though those below the median received somewhat more overall help than

Table 1 Frequency of help in activities of daily living from different sources among women and men aged 70 and over (weighted proportions)

	Frequency of help (%)					
	No help	Less often than weekly	Weekly or a few times a week	Daily or more often	Help total	All
<i>Women</i>						
All help	60	10	16	14	40	100
Help from informal caregivers	66	8	14	13	34	100
Spouse	94	0	2	4	6	100
Among those who have a spouse	79	1	6	14	21	100
Children and their spouses	74	8	11	8	26	100
Among those who have children	69	9	13	9	31	100
Other relatives, neighbors and friends	88	6	5	1	12	100
Help from formal public caregivers	84	6	6	4	16	100
Home help or home aid	87	3	6	4	13	100
Visiting nurse	90	7	2	1	10	100
Help from other source	94	4	1	0	6	100
<i>N</i> (unweighted)						759
<i>Men</i>						
All help	74	5	7	13	26	100
Help from informal caregivers	79	2	7	12	21	100
Spouse	89	0	1	9	11	100
Among those who have a spouse	85	0	2	13	15	100
Children and their spouses	87	4	7	3	13	100
Among those who have children	84	4	8	3	16	100
Other relatives, neighbors and friends	93	3	3	1	7	100
Help from formal public caregivers	90	4	4	2	10	100
Home help or home aid	91	3	4	2	9	100
Visiting nurse	95	3	2	0	5	100
Help from other source	96	3	0	0	4	100
<i>N</i> (unweighted)						407

Table 2 Combination of different types of help according to different determinants, weighted proportions adjusted for age

	Receives only formal help	Receives formal and other type of help	Receives only other than formal help	No help	All	Distribution	
						Unweighted <i>N</i> ^a	Weighted % ^b
All	3	11	21	65	100	1,166	100.0
Gender							
Female	3	12	23	61	100	759	62.5
Male	3	8	17	72	100	407	37.5
Age							
70–74	1	3	14	82	100	410	44.9
75–79	3	6	23	68	100	256	28.0
80–84	5	24	29	42	100	315	17.2
85+	6	36	33	26	100	185	10.0
Cognitive ability							
Good	2	7	19	72	100	525	48.9
Fairly good	3	12	17	68	100	358	30.6
Fairly poor	7	14	30	49	100	165	12.7
Poor	3	24	37	37	100	116	7.8
Mobility							
No limitations	2	4	12	82	100	620	58.4
Some limitations	4	10	31	55	100	328	26.9
Severe limitations	7	35	44	14	100	217	14.7
PADL limitations							
No limitations	3	6	17	74	100	857	76.9
Limitations in 1–2 functions	3	15	33	49	100	182	14.6
Limitations in 3–5 functions	11	41	35	13	100	125	8.5
IADL limitations							
No limitations	2	3	15	80	100	746	69.8
Limitations in 1–2 functions	4	16	37	42	100	214	17.1
Limitations in 3–4 functions	8	40	41	12	100	194	13.1
Education							
More than upper basic	4	7	19	70	100	279	24.8
Upper basic	2	8	23	68	100	300	26.7
Lower basic or unknown	3	14	21	62	100	587	48.5
Household equivalized income							
1st quartile (highest)	4	9	16	70	100	273	25.0
2nd quartile	2	10	21	67	100	282	25.0
3rd quartile	3	11	25	62	100	292	25.0
4th quartile (lowest)	3	13	21	63	100	319	25.0
Type of municipality							
Rural	2	10	21	67	100	349	29.9
Densely populated	2	12	22	63	100	468	40.8
Ten largest cities	4	9	18	68	100	349	29.3
Living arrangements and spousal help							
Lives alone	5	12	20	62	100	591	47.9
Lives with spouse, all	1	8	20	71	100	493	45.9
No help from the spouse	1	5	7	87	100	393	38.0
Receives help from the spouse	0	18	82	0	100	100	8.0
Lives with other(s) than spouse	1	12	41	46	100	82	6.1

Table 2 continued

	Receives only formal help	Receives formal and other type of help	Receives only other than formal help	No help	All	Distribution	
						Unweighted <i>N</i> ^a	Weighted % ^b
Help from children or their spouses							
No help from children	3	3	9	85	100	678	62.6
Less than weekly help	0	22	78	0	100	80	6.1
One or a few times a week	0	29	71	0	100	134	9.4
At least daily help	0	44	56	0	100	89	5.9
No children	9	9	14	67	100	185	16.0
Help from other relatives, friends and neighbors							
No help from others	3	8	17	72	100	1016	89.8
Less than weekly help	0	25	75	0	100	70	5.0
At least weekly help	0	28	72	0	100	76	5.2

Direct age adjustment with the population of women and men combined as the standard population and with age classes 70–74, 75–79, 80–84 and 85+

^a *N* are the unweighted number of observations

^b Percentages are calculated as weighted with sampling weights

those above the median. The type of municipality was not clearly associated with receipt of help.

Living arrangements and informal care were clearly related to the care mix. We combined receipt of spousal help with the variable of living arrangements because of the overlap of these variables. There was no need to take into account the frequency of spousal help over and above the overall receipt of such help since only few of those receiving spousal help reported receiving it less often than daily. Those living with their spouse but not receiving spousal help received least formal help and also least overall help compared to those in other living arrangements, largely due to their better average functional status (these factors were adjusted for in logistic regression analysis below). Those living with someone else than their spouse received most help, and most often this help came from other than formal sources—this help was largely intra-household help from children or from other relatives. Those living alone received average levels of help. Help from children was also of importance: the more often the children helped, the more likely the older person was to receive also formal help. Receiving formal help was least common among those not receiving help from their children, which again is partly related to good average functional status. Those who had no children received formal help slightly more often than average. Also, increased extent of help from other relatives and friends was positively associated with receipt of formal help.

The differences in care mix according to different characteristics presented above may partly arise from differences in functional capacity and other factors. Therefore, to estimate the independent association of each variable, we ran logistic regression models on receiving

formal help (Table 3). Odds ratios adjusted for gender and age (first column) demonstrate the same pattern of associations as observed in Table 2. In Model 1, we see that the effects of all indicators of functional ability were strongly attenuated when adjusted for at the same time. Differences by PADL limitations and cognitive ability almost disappeared whereas mobility difficulties and especially IADL limitations were associated with the use of formal help also when the other indicators of functional ability were adjusted for. Interestingly, only those having fairly good cognitive ability had increased odds of receiving formal care compared to those having good ability. Practically, no changes in the aforementioned estimates occurred when education, income and type of municipality were added into the model (Model 2).

Lastly, we added the variables related to living arrangements and informal help (Model 3). The gender difference disappeared when living arrangements were adjusted for: men were less likely to receive formal help than women largely because they were less likely to live alone. Again, estimates for the factors related to functional capacity remained practically unchanged. No clear gradient of income was visible even though adjustment of living arrangements revealed the pattern that those with most resources tended to receive more formal help than others.

Effects of living arrangements were revealed in Model 3, largely due to adjustment for functional ability. The odds of receiving formal care were highest among those living alone. Those not receiving help from their spouse did not differ statistically significantly from those living alone when functional capacity was adjusted for. In contrast, those living with their spouse and receiving spousal help and those living with others than their spouse were

Table 3 Odds ratios for receiving formal help according to different determinants

	Adjusted for gender and age		Model 1 ^a		Model 2 ^b		Model 3 ^c	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Gender								
Female	1.00		1.00		1.00		1.00	
Male	0.64	0.44–0.91	0.56	0.37–0.85	0.57	0.38–0.88	0.70	0.43–1.15
Age								
70–74	1.00		1.00		1.00		1.00	
75–79	2.39	1.24–4.59	1.57	0.85–2.92	1.59	0.87–2.93	1.63	0.88–3.03
80–84	9.07	5.29–15.6	4.27	2.39–7.60	4.14	2.33–7.35	4.18	2.33–7.49
85–99	16.16	9.04–28.9	3.98	2.19–7.25	3.77	2.08–6.83	3.05	1.63–5.71
Cognitive ability								
Good	1.00		1.00		1.00		1.00	
Fairly good	2.09	1.35–3.23	1.67	1.03–2.70	1.65	1.02–2.69	1.72	1.03–2.89
Fairly poor	3.32	1.98–5.57	1.49	0.81–2.74	1.43	0.77–2.66	1.21	0.62–2.34
Poor	4.10	2.35–7.13	1.43	0.73–2.82	1.35	0.69–2.66	1.30	0.64–2.64
Mobility								
No limitations	1.00		1.00		1.00		1.00	
Some limitations	3.40	2.07–5.59	1.69	0.94–3.03	1.71	0.93–3.14	1.60	0.81–3.15
Severe limitations	11.17	6.48–19.3	2.64	1.27–5.49	2.84	1.33–6.09	2.44	1.06–5.63
PADL limitations								
No limitations	1.00		1.00		1.00		1.00	
Limitations in 1–2 functions	2.82	1.84–4.34	0.94	0.54–1.65	0.86	0.48–1.54	0.94	0.51–1.70
Limitations in 3–5 functions	9.30	5.42–16.0	1.41	0.66–2.99	1.35	0.62–2.98	1.47	0.67–3.24
IADL limitations								
No limitations	1.00		1.00		1.00		1.00	
Limitations in 1–2 functions	6.78	3.93–11.7	4.83	2.61–8.92	4.78	2.56–8.94	4.34	2.35–8.02
Limitations in 3–4 functions	19.24	11.5–32.2	8.85	4.07–19.2	8.98	3.94–20.5	9.55	3.93–23.2
Education								
More than upper basic	1.00				1.00		1.00	
Upper basic	0.77	0.43–1.37			0.70	0.34–1.43	0.75	0.36–1.56
Lower basic or unknown	1.64	1.05–2.55			1.25	0.70–2.23	1.64	0.90–3.00
Household equivalized income								
1st quartile (highest)	1.00				1.00		1.00	
2nd quartile	0.87	0.51–1.49			0.60	0.31–1.16	0.40	0.19–0.83
3rd quartile	1.01	0.60–1.69			0.67	0.35–1.28	0.49	0.25–0.98
4th quartile (lowest)	1.25	0.78–2.01			0.93	0.50–1.76	0.56	0.28–1.12
Type of municipality								
Rural	1.00				1.00		1.00	
Densely populated	1.21	0.78–1.88			1.38	0.81–2.35	1.36	0.78–2.38
Ten largest cities	1.03	0.65–1.61			1.57	0.87–2.83	1.16	0.64–2.11
Living arrangements and spousal help								
Lives alone	1.00						1.00	
Lives with spouse, no spousal help	0.26	0.14–0.48					0.59	0.31–1.11
Lives with spouse, receives spousal help	1.15	0.66–2.00					0.35	0.15–0.82
Lives with other(s) than spouse	0.63	0.34–1.17					0.11	0.04–0.29
Help from children or their spouses								
No help from children	1.00						1.00	
Less than weekly help	5.44	3.01–9.85					3.03	1.48–6.21
One or a few times a week	7.81	4.39–13.9					3.71	2.02–6.81

Table 3 continued

	Adjusted for gender and age		Model 1 ^a		Model 2 ^b		Model 3 ^c	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
At least daily help	8.29	4.39–15.7					4.78	1.74–13.2
No children	4.46	2.60–7.67					3.77	2.05–6.94
Help from other relatives, friends and neighbors								
No help from others	1.00						1.00	
Less than weekly help	2.51	1.30–4.84					1.39	0.70–2.76
At least weekly help	3.43	1.89–6.24					0.99	0.49–2.01

^a Gender, age, cognitive ability, mobility, PADL and IADL limitations

^b Model 1 + education, income and type of municipality

^c Model 2 + living arrangements, help from children and help from relatives, friends and neighbors

significantly less likely to receive formal help than those living alone. Comparing the age- and gender-adjusted models (first column) and Model 3, the analyses imply that if those living with their spouse and receiving spousal help and those living with others than their spouse had as good functional capacity as those living alone, they would be even less likely to receive formal help.

The estimates related to getting help from children were also attenuated when functional status was taken into account. Still, the more often the children helped, the more likely the elders were to receive also formal care, the odds being highest among those receiving daily help from children. The odds among those having no children were at the same level as among those receiving weekly help from children.

Help from others was not related to receipt of formal help when adjusted for other factors, especially for functional capacity.

Furthermore, possible gender differences were examined with interactions. The only statistically significant gender interaction was observed between gender and living arrangements. This interaction indicated that men living with a spouse who helped had an OR of only 0.10 of receiving formal help, whereas the OR was 0.34 among those living with a non-helping spouse. Among women, on the other hand, neither of the groups living with their spouse differed from the reference category of those living alone. Among both genders, those living with others than their spouse had low odds of receiving formal help (OR 0.11 for women and 0.14 for men, respectively).

Discussion

This study aimed to estimate the frequency of help from different informal and formal sources and to assess the association of different types of factors with receipt of formal help among older people in Finland, a welfare state

with a principle of universal allocation of formal care for older people. In contrast to a previous Finnish study concentrating on home care clients only (Hammar et al. 2008), our study focusing on all community-dwelling elders allowed us to assess the associations at the population level. In the Finnish community-dwelling population of those aged 70 and over, 65% received no help, 3% received only public formal help, 21% received other types than public formal of help (mainly informal help) and 11% both formal and other types of help. The pattern of help received in Finland is roughly similar to that in Sweden, where 58% of those aged 75+ receive no help, 30% receive informal help and 20% formal help, the categories partly overlapping (Davey et al. 2005). In contrast, the percentages are very different from those obtained from the US where 36% of persons aged 75+ receive no help, 63% receive informal help and 10% receive formal help (Davey et al. 2005). However, comparison of these proportions over countries gives only a rough picture since the results may be affected, for example, by different sources of data and different definitions of formal help. Still, it seems evident that cultural norms strongly affect supply and use of both informal and formal help (Davey et al. 1999; Walter-Ginzburg et al. 2001). The comparison also reflects the strong publicly funded social services and health-care systems in Scandinavian welfare states. In these countries, only few older people live with their children, and children have no legal obligations to provide care for their parents. Thus, older people are more accustomed to rely on formal services in terms of their care arrangements compared with other countries, such as the USA where care responsibilities lie more heavily on the informal sector (Davey et al. 2005).

Even though men received less formal help than women, gender was not associated with receipt of formal help when adjusted for other factors and especially for living arrangements, a finding echoing that reported by Larsson and Thorslund (2002). As shown in several previous studies (e.g., Branch and Jette 1983; Kemper 1992;

Kadushin 2004), factors associated with need of help were strongly associated with receipt of formal help. We found that increasing age and increasing limitations in mobility and in IADL were associated with use of formal care after adjustment for other indicators of functional capacity. No independent effects of PADL were found, a result consistent with those obtained previously from Swedish data (Larsson and Thorslund 2002; Larsson and Silverstein 2004). The effects of cognitive ability were less clear, as only those with fairly good cognitive ability had increased odds compared to those with the best ability. One explanation for the finding may be that other things being equal, more severe cognitive impairment may have prevented from seeking formal help, whereas those with only mild impairment still had this capacity. However, the role of cognitive impairment may have been left uncertain here as also in previous studies; perhaps, due to the inaccuracy of cognitive test scores in measuring the effect of cognitive status on the use of services (Kadushin 2004).

The effects of socioeconomic status may be blurred by the fact that there are two separate processes at work: on the one hand, because of better health, those with a higher status may not need services as often as those with a lower status, but on the other hand, those with a better socioeconomic status may have increased means to pay for services and better knowledge of and access to these services. There may also be differences in care preferences between the socioeconomic groups (Andersen 1995; Larsson and Silverstein 2004; Davey et al. 2005; Broese van Groenou et al. 2006). Our results showed that even in the Finnish context of a universal welfare system, some indication of a positive association between high income and greater use of services may be observed. Also, some previous studies have found a positive relationship between high socioeconomic status and greater use of services, for example, in the US (Bass and Noelker 1987; Stoller and Cutler 1993) and in Sweden (Larsson and Silverstein 2004). In contrast, many other studies have found no effects of socioeconomic factors on formal service use after adjusting for age, health and marital status (Larsson and Thorslund 2002; Shea et al. 2003; Geerlings et al. 2005; Motel-Klingebiel et al. 2005; Broese van Groenou et al. 2006). This may be a result of the opposite processes mentioned above or it may indicate equal allocation of services to different socioeconomic groups.

Differences according to type of municipality were not observed in our study, even though official statistics show that there is a slightly higher coverage of regular home-based help in small and rural municipalities compared with other municipalities, defined as the proportion of persons aged 75 or over receiving regular home care (Care and Services for Older People 2002). It is thus possible that our indicator of the type of municipality does not capture

satisfactorily the variation in the potential supply of formal help services. The result may also be blurred by differences in the attitudes towards seeking formal help and knowledge about the available services in different types of settings.

Even though we found no significant differences between genders in the adjusted levels of receipt of formal help, the effects of living arrangements were found to be different among women and men. Previous research has concluded that living with someone versus living alone rather than marital status as such is associated with the lesser use of formal services (Cafferata 1987; Tennstedt et al. 1993a). However, our study showed that this might not be generalized to both genders. In our study, all men with co-residents were less likely to use formal home-based help compared to those living alone, whereas for women this was only true for those living with other people than their spouse. Men may be able to cope better with daily tasks when there is someone in the household, whether it is the wife or someone else helping with the indispensable household chores. Older women living with a spouse, on the other hand, may have to carry a disproportional responsibility of household tasks as they possibly get only little help from their husband (Hank and Jürges 2007). In contrast, women living with someone else than their spouse, such as their children, may get more help to share their workload.

Considering the pattern of women performing a larger share of the housework, it is rather surprising that a larger proportion of women than men having a spouse reported receiving spousal help. There may thus be gender differences in reporting spousal help: men may not always consider the daily tasks performed by their spouse as help but take those services for granted, even though this help may be crucial for their survival in the community. However, even though the proportions of those receiving help from their spouses differ between women and men, there may be a much smaller difference in the absolute numbers. When the number of older women is considerably higher than the number of older men, and when the overall proportion of older women receiving spousal help is much lower than that among men (with fewer older women having a spouse), this may produce about the same absolute numbers of women and men receiving—and thus also providing—spousal help. This may be an important note from the policy perspective and needs to be taken into account when creating incentives and services to support informal care in the society.

Spouses and children as sources of informal help differ from each other in important respects. Spousal help is most often daily intra-household help but help from children, most often not living in the same household, is generally less frequent and less intensive. Our results showed that also help from children was an important predictor of use of formal help, but in a different pattern as compared to

spousal help. Those not getting help from their children had by far the lowest odds of receiving formal help compared to both those who did get help from children and those who did not even have children. The more frequent the help provided by children was, the more likely the person was to receive also formal help. The results suggest that the more involved the children are in their parents' life, the more they are prone to seek also public formal help for their parents when it is needed. Children may thus act as advocates for public social services for the elders even in a welfare state with universal and equal allocation of services. Also, Geerlings et al. (2005) have found support in favor of this process of “bridging”, with informal network acting as a bridge between older people and formal service providers.

Even though we adjusted for a wide variety of need factors, the observation that those not receiving help from children received only low levels of formal help may partly reflect that this group also had the lowest need for overall help. Another explanation may be that even though allocation of services should be based on need only, those providing formal elderly care may trust and rely that older persons with children cope with their everyday tasks with the help of their children and do not thus need formal help, whereas those who do not have children may be better covered by the formal services. This explanation finds support from the finding that the prevalence of those receiving formal help was similar among those having no children at all and those getting help from their children. Also, those receiving help neither from their children nor from formal sources may be characterized by values emphasizing the importance of managing alone and independent living without help from any source.

Thus, this study found that also in Finland, a welfare state with a principle of equal allocation of services, presence of co-residents and access to informal care affect use of formal services. This may indicate, first, that those getting informal help do not need and/or choose not to apply for formal services, or, second, that municipal authorities tend not to allocate formal help to those who have informal help available.

Research evidence on the question of substitution versus complementarity remains inconclusive, largely because of the varied research designs and lack of consensus on how these issues should be investigated. Studies have been conducted both at the individual level and at the country level, both with cross-sectional and longitudinal data, with different populations and using varied definitions of formal help. Following Sundström et al. (2006), we believe that the dynamic concepts of substitution and complementarity are inappropriate when using cross-sectional data. Still, as far as some conclusions may be drawn also from cross-sectional design, our results imply complementarity of the

two types of help. First, most of those receiving formal help received also informal help and this proportion increased with decreasing functional capacity, a result found also elsewhere (Sundström et al. 2006). Second, also the fact that increasing frequency of help from children increased the odds of receiving formal help—partly through processes of bridging—suggests a complementary relationship between the two types of help.

We used a randomized sample of population-based data representative of community-dwelling Finns aged 70 and over, with varied information on sociodemographic characteristics and functional capacity and with the ability to distinguish the frequency of help received from different sources. Even though we found strong associations between many of the individual characteristics and receipt of formal help, the cross-sectional nature of the data poses challenges for the interpretation of the results regarding the order of causation, a problem that is commonly encountered in studies on the interplay between help and its determinants. Further research may clarify the complex interplay between formal and informal care with detailed longitudinal data covering the whole process from no need of help to deteriorating functional capacity and subsequent receipt of informal and formal care in different living arrangements.

Further limitations include the lack of caregiver and coresident characteristics in the data, affecting the caregiving potential of spouses and children. Additionally, it is possible that we were not able to adjust completely for functional capacity even though we had information on several factors related to cognitive and physical ability and problems in activities of daily living. Other factors relating to the need of help that were not taken into account include, for example, housing conditions and distance to shops and other local services. Assessment of the effects of contextual factors on the use of care remains a challenge for future research.

Conclusion

Even in a welfare state based on the principle of universal allocation of services such as Finland, the availability and the extent of informal care strongly affects use of formal home-based care among older people. This finding has implications for the target of creating efficient and equal care systems at a reasonable cost in the future. The results obtained here suggest that those with intra-household help available are less dependent on formal services than those living alone. However, increasing levels of assistance from children is associated with increasing levels of using also formal care, thus reflecting complementarity of formal and informal care. Public policy should further enhance the

caregiving possibilities of the potential informal carers. On the other hand, the service system should ensure that all elders in need have equal access to home-based formal care irrespective of whether or not they have children committed to arranging this care for their parents.

Future need for formal care arrangements will be affected by the development of functional capacity of older people, but also by the future prevalence of marriage or cohabitation and by the availability of spouses and children as caregivers (Gaymu et al. 2008). Population projections show that the proportions of older people living with a spouse and of those having surviving children are increasing during the next 30 years, suggesting an increase in the availability of informal help (Kalogirou and Murphy 2006; Murphy et al. 2006). However, more information is needed on the willingness and abilities of spouses and children in different life circumstances and social contexts to provide informal help to family members in need of care.

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