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Family Caregiver Training Needs and Medicare Home Health Visit Utilization

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Abstract

Background: Medicare home health providers are now required to deliver family caregiver training, but potential consequences for service intensity are unknown.

Objectives: Assess how family caregiver training needs affect the number and type of home health visits received.

Design: Observational study using linked National Health and Aging Trends Study (NHATS), Outcomes and Assessment Information Set (OASIS), and Medicare claims data. Propensity score adjusted, multivariable logistic and negative binomial regressions model the relationship between caregivers' training needs and number/type of home health visits.

Subjects: 1,217 (weighted n=5,870,905) National Health and Aging Trends Study participants receiving Medicare-funded home health between 2011-2016.

Measures: Number and type of home health visits, from Medicare claims. Family caregivers' training needs, from home health clinician reports.

Results: Receipt of nursing visits was more likely when family caregivers had medication management (aOR: 3.03; 95% CI: 1.06, 8.68) or household chore training needs (aOR: 3.38; 95% CI: 1.33, 8.59). Receipt of therapy visits was more likely when caregivers had self-care training needs (aOR: 1.70; 95% CI: 1.01, 2.86). Receipt of aide visits was more likely when caregivers had household chore (aOR: 3.54; 95% CI: 1.82, 6.92) or self-care training needs (aOR: 2.12; 95% CI:

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1.11, 4.05). Medication management training needs were associated with receiving an additional 1.06 (95% CI: 0.11, 2.01) nursing visits, and household chores training needs were associated with an additional 3.24 total (95% CI: 0.21, 6.28) and 1.32 aide visits (95% CI: 0.36, 2.27).

Conclusions: Family caregivers' activity-specific training needs may affect home health visit utilization.

Keywords

Home health; Medicare; Home care; Family caregiving; Older adult

INTRODUCTION

Family and unpaid caregivers (hereafter, “family caregivers”) provide regular assistance to older adults with whom they share a close relationship. These caregivers have a foundational role in supporting older adults' health and well-being.¹ In recognition that family caregivers often assist with medical and nursing activities,² there is growing interest in better preparing them to confidently and competently provide assistance.^{1, 3–10} Family caregiver capacity is especially relevant in the context of Medicare-funded home health care, in which eligible beneficiaries receive skilled nursing, therapy, and personal care aide services in their homes. Staff are present intermittently and rely on family caregivers' assistance to meet patients' complex medical and social needs.^{11,12} In 87% of Medicare-funded home health episodes, clinicians report a need for family caregiver assistance to enact the home health plan of care.¹²

The majority of family caregivers of older adults receive no training related to their role¹³ and feeling unprepared for their caregiving responsibilities.¹ Those assisting during home health are no exception: home health clinicians identify more than 1 in 3 caregivers who assist during home health as in need of training.¹⁴ Given family caregivers' frequent involvement in home health care, in 2017 the Centers for Medicare and Medicaid Services (CMS) revised Medicare Home Health Conditions of Participation to mandate that providers offer family caregiver training.¹⁵

Prior studies of family caregiver training have been limited to the ambulatory setting and have largely assessed how training affects caregivers' feelings of burden and/or self-efficacy.^{16–21} Limited information exists regarding the potential effects of caregiver training on home health care delivery or outcomes, or best practices for supporting family caregiver training interventions in this setting. A better understanding of how family caregiver training needs affect Medicare home health care is relevant to the new CMS training mandate and could inform interventions to improve the quality and patient- and family-centeredness of home health care.

This study provides the first information regarding the effects of family caregiver training needs on utilization—specifically, the number and type of visits—during home health. Visits are the basic unit of home health care and a major determinant of home health profit margins.^{22, 23} Home health clinicians base decisions regarding visit structure in part on family caregiver availability.^{24–26} We rely on a novel dataset linking nationally representative

survey data with Medicare claims and patient assessments and use regression models to assess the relationship between family caregiver need for activity-specific training and the number and type of home health visits received. Findings are relevant to ongoing efforts by providers and policymakers to better support family caregivers of older adults and to understand how family caregiver factors affect health care utilization for this population.

METHODS

Data Sources and Analytic Sample

Data for this study were drawn from four linked data sources: the National Health and Aging Trends Study (NHATS), the Outcomes and Assessment Information Set (OASIS), Medicare claims, and Medicare Provider of Services files. NHATS is an annual, nationally representative survey of Medicare beneficiaries ages 65 and older using in-person interviews to collect comprehensive information on participants' sociodemographic characteristics, health and functional status, and receipt of family caregiver assistance. OASIS is a standardized patient assessment completed by a home health clinician (Registered Nurse or Physical Therapist) and submitted to CMS at regular intervals during a Medicare-funded, 60-day home health episode. OASIS includes information regarding the older adult's clinical and functional status, plan of care, and receipt of family caregiver assistance. Provider of Services files are publicly-available sources of information on the characteristics of Medicare-certified providers, including home health providers.

The sample includes community-living older adults who participated in the 2011 NHATS and received Medicare-funded home health within one year of the baseline interview (2011) or a subsequent interview (2012-2015). NHATS was initially fielded in 2011 and the sample was replenished in 2015. Weights for participants entering the sample in the 2015 replenishment round correspond to a different reference population;²⁷ therefore, we limited our sample to NHATS participants who first entered the NHATS sample in 2011. We excluded NHATS participants who did not use home health services during this period, as well as those living in congregate settings (e.g. assisted living) during the time of NHATS interview, due to the availability of supports that may affect home health services utilization. We examined only the index home health episode; therefore, each participant appears in the dataset once. Our sample included Medicare fee-for-service enrollees and excluded Medicare Advantage enrollees, as claims data were unavailable for the latter. Of the 8,245 NHATS respondents included in the initial 2011 survey wave, 1,217 accessed Medicare home health within 12 months of survey and were community-living and enrolled in fee-for-service Medicare in the year they received home health.

We pooled NHATS data from 2011-2015 with linked OASIS data and Medicare claims from 2011-2016. For each participant, we matched the OASIS Start of Care filing for their index home health episode during the observation period with the NHATS interview immediately preceding the home health episode. We then identified claims filed for home health services provided during the 60-day index episode. Finally, we used CMS Certification Numbers (unique identifiers assigned to each Medicare-certified provider) present in the claims to link to Provider of Services data for each provider.

Measures

Older Adult and Home Health Provider Characteristics—From NHATS, we drew measures of older adults' sociodemographic characteristics (age, sex, race, Medicaid-enrollment), receipt of family caregiver assistance (number of caregivers, types of caregiving assistance received), living arrangement (whether they live alone), and health status (fallen in past year, self-reported overall health) prior to receiving home health services. Types of caregiving assistance include help with medication management, and household, mobility, or self-care tasks due to issues with health or function.

From OASIS, we drew measures of older adults' living arrangement (whether they live alone), post-acute status (whether they received inpatient care within 14 days of receiving home health care), treatments (any respiratory or intravenous therapy), clinical severity (overall clinical severity, presence of pressure ulcer, presence of surgical wound), functional impairment, and cognitive impairment during the home health episode. Overall clinical severity and functional impairment were determined from Health Insurance Prospective Payment System codes²⁸ that identify home health patients as having low, moderate, or significant clinical severity and little or no, moderate, or significant functional impairment. Cognitive impairment was measured via home health clinician assessment of the older adult.²⁹ From Provider of Services data, we drew a measure of whether the home health provider was nonprofit.³⁰

Family Caregiver Need for Training—In OASIS, home health clinicians document whether a patient needs family caregiver assistance with specific activities (in addition to care provided by home health staff), whether they receive this assistance, and whether the caregiver needs training in order to provide this assistance.²⁹ For each caregiving activity, we constructed a binary indicator of whether the family caregiver had an identified need for training, limiting the sample to cases in which home health clinicians identified the older adult as both requiring and receiving family caregiver assistance with that activity.

In prior analyses, we found that family caregiver assistance was required in 87% of home health episodes¹² and that 36% of caregivers assisting during home health had an identified need for training with at least one caregiving activity.¹⁴ Rates of caregiver involvement and need for training varied considerably by caregiving activity. In this study, we consider caregiving activities for which at least 50% of older adults were assessed as requiring family caregiver assistance¹² and at least 10% of caregivers had an identified need for training.¹⁴ These activities are:

1. Household chores (assisting with meals, housekeeping, laundry, telephone, shopping),
2. Self-care tasks (assisting with ambulation, bathing, dressing, toileting, eating/feeding),
3. Medication management (managing and administering medications),
4. Patient supervision (monitoring to ensure patient's safety).

Number and Type of Home Health Visits—During a home health episode the patient may receive varying numbers of visits from home health staff and these visits may include a mix of skilled nursing, skilled therapy, personal care aide, and other service types. Through December 2019, Medicare home health was reimbursed and delivered in 60-day episodes of care.^{31, 32} Using Medicare claims, we derived counts of home health visits provided within each 60-day index home health episode.

We constructed separate variables for nursing, therapy, aide, training, and total visits from Healthcare Common Procedure Coding System codes.^{33, 34} Nursing visits include Registered Nurse (RN) or Licensed Practical Nurse (LPN) provision of direct care, evaluation of the plan of care, or observation of the patient's condition. Training visits include RN or LPN provision of training/education regarding the plan of care, and are noted separately from visits in which RN/LPN provides direct care. Therapy visits include Physical Therapist (PT), Occupational Therapist (OT), Speech Language Therapist, or PT or OT Assistant provision of direct care or development of a program of therapy. Personal care aide visits refer to visits from a Home Health Aide. Total visits were computed by summing the number of reported nursing, therapy, aide, and training visits.

Statistical Analysis

Propensity Score Adjustment—We used propensity score adjustment to account for a number of underlying patient characteristics that could confound the relationship between caregiver need for training and the intensity of home health care provided. Propensity score adjustment yields treatment and comparison groups that are balanced with regard to observed characteristics, allowing for an unbiased estimation of treatment effect, assuming no unmeasured confounders.³⁵ For each caregiving activity, we used logistic regression to model individuals' probability of having a caregiver with an identified need for training (the "treatment") as a function of a range of potential confounders observed prior to the home health episode—including older adult sociodemographic characteristics and health status, caregiver availability, and types of caregiver assistance received. We weighted the propensity score estimation models using NHATS survey weights, a previously-validated method of accounting for complex survey design in the propensity score estimation.³⁶

We adjusted for each individual's propensity score using weighting by the odds. Treated individuals received a weight of 1 and untreated individuals received a weight of $e/(1-e)$, where e represents the individual's propensity score.³⁷ Following propensity score adjustment, the standardized differences in means of observed covariates between treatment and comparison groups were all less than 10%, indicating satisfactory covariate balance.³⁵ To adjust for each individual's probability of treatment while simultaneously accounting for complex survey design, we created composite weights equal to the product of each individual's propensity score weight and NHATS survey weight—an approach described and validated in prior literature^{36–39}—and truncated outlier weights to the 99th and 1st percentiles.^{36, 37} These composite weights were used in our final analyses. (*See Supplemental Digital Content Section 1 for greater detail regarding propensity score development and resulting improvement in balance.*)

Regression Models—We used multivariable, weighted logistic regression to model the odds of receiving any nursing, therapy, aide, or training visits during a Medicare home health episode, as a function of family caregivers' identified activity-specific training needs. We constructed multivariable, weighted negative binomial regressions to model the expected number of total, nursing, therapy, aide, or training visits during a Medicare home health episode as a function of family caregivers' identified activity-specific training needs. In each regression, the analytic sample consists of older adults receiving caregiver assistance with the specific activity of interest. Prior analyses revealed over-dispersion for all visit types, suggesting a need for negative binomial models, and a high frequency of participants who received 0 therapy, aide, or training visits, suggesting a need for zero-inflated models for these visit types. (see Supplemental Digital Content eTable 2).

All models adjusted for the following characteristics, measured *prior to* the home health episode: older adults' sociodemographic characteristics, receipt of family caregiver assistance, living arrangements, and health status. All models also adjusted for the following characteristics, measured *during* the home health episode: older adults' post-acute status, treatments received, clinical severity, functional impairment, cognitive impairment, living arrangements, and home health provider nonprofit status. All models are weighted using composite weights to adjust for both propensity score and complex survey design. All analyses were performed using Stata 14 (StataCorp LLC, College Station, TX).

Sensitivity Analyses—Given that our treated and comparison groups were relatively balanced on observed covariates even prior to propensity score adjustment (see Supplemental Digital Content eTable 1), we replicated all previously described regression analyses without propensity score adjustment. Propensity score adjustment provides unbiased estimates under the assumption that there no unobserved confounders. To examine the sensitivity of our results to potential violation of this assumption, we applied an approach developed by Greenland (1996)⁴⁰ to estimate the relationship between family caregiver activity-specific training needs and types of visits received, while adjusting for a potential unobserved confounder.

RESULTS

Among community-dwelling Medicare beneficiaries receiving family caregiver assistance during home health care, 40.5% were male, 19.6% were non-white, and 16.7% were Medicaid-enrolled (Table 1). Prior to home health, the proportion of study participants receiving self-care assistance was 25.4% and the proportion reporting fair/poor health was 41.9%. During home health, 32.4% had high clinical severity, 20.4% had high functional impairment, and 44.1% had cognitive impairment. The average number of total visits received during the 60-day episode was 16.9.

Older adults whose family caregiver had an identified need for training with household chores were more than three times as likely to receive nursing (Adjusted Odds Ratio (aOR): 3.38; 95% confidence interval (95% CI): 1.33, 8.59) or aide visits (aOR: 3.54; 95% CI: 1.82, 6.92; Table 2), compared to older adults who did not have family caregivers with an identified need for training. Older adults whose family caregiver had an identified need for

training with self-care tasks had greater odds of receiving therapy (aOR: 1.70; 95% CI: 1.01, 2.86), aide (aOR: 2.12; 95% CI: 1.11, 4.05), or training visits (aOR: 1.49; 95% CI: 1.01, 2.21). Older adults whose family caregiver had an identified need for training with medication management were more than three times as likely to receive nursing visits (aOR: 3.03; 95% CI: 1.06, 8.68).

Older adults whose family caregiver had an identified need for training with household chores incurred 3.24 (95% CI: 0.21, 6.28) additional total visits and 1.32 (95% CI: 0.36, 2.27) additional aide visits (Table 3). Older adults whose family caregiver had an identified need for training with medication management incurred 1.06 (95% CI: 0.11, 2.01) additional nursing visits. Family caregivers' identified need for training, across all caregiving activities, did not significantly affect the number of training visits received.

Sensitivity Analyses

When replicating our regressions without propensity score adjustment, we found little variation in the direction and strength of observed relationships. However, several findings were no longer statistically significant, suggesting that observed potential confounders did attenuate these relationships. Observed relationships that *remained* statistically significant included: family caregiver need for training on household chores or self-care tasks and the greater likelihood of receiving any aide visits, family caregiver need for training on household chores and the greater number of total visits and aide visits, and family caregiver need for training on medication management and the greater number of nursing visits (see Supplementary Digital Content eTables 3 and 4).

Results were robust to potential violation of the assumption of no unobserved confounder. After applying an approach described by Greenland (1996)⁴⁰ we found that all significant parameter estimates from our adjusted logistic regressions (Table 2) were within the 95% confidence intervals for the “true” relationships estimated by this sensitivity analysis (see Supplemental Digital Content eTable 5).

DISCUSSION

Among Medicare beneficiaries receiving family caregiver assistance during a home health episode, family caregivers' identified need for activity-specific training was associated with greater visit intensity during the episode. Older adults whose family caregivers had an identified need for training with household chores, self-care tasks, or medication management received a greater number of aide, therapy, and nursing visits, respectively. Findings demonstrate that family caregiver factors—specifically, need for training—affect resource utilization during Medicare home health. Study results support ongoing policy efforts to systematically assess and address family caregiver needs¹⁵ and raise the possibility that investing in family caregiver training could be cost-effective at a system level by reducing the intensity of care provided.

A growing body of literature indicates that family caregiving factors may influence older adults' health care utilization.^{3-6, 9, 10} Previous studies have found associations between family caregiver factors and long-stay nursing facility entry,^{6, 9} as well as emergent care

utilization.⁴ While previous studies have examined the impact of family caregiver presence on access to home health services,^{41, 42} this is the first study to test for relationships between specific family caregiver factors and utilization during a home health episode. Additionally, previous work has measured health care utilization in two ways, by examining binary measures of access/admission^{4, 6, 9, 42} and health care spending.^{5, 43} In contrast, this study assesses how family caregiver capacity and needs affect intensity of care delivery within a specific health care setting, and may be used to guide development of clinically-relevant interventions.

Study findings have relevance for the design, implementation, and testing of interventions specific to home health, suggesting another potential avenue to improve the quality and efficiency of home health care. While no prior work has examined caregiver training interventions in the home health setting, the preponderance of existing literature surrounding family caregiver training interventions finds positive effects on caregiver-reported outcomes (e.g. depressive symptoms, burden, sense of self-efficacy related to caregiving)^{17–21} and older adult quality of life and function.^{18, 44} Our findings indicate the potential for targeted training interventions to improve the efficiency of home- and community-based services as training needs are linked to a greater number of direct care visits.

The lack of significant relationships between caregiver need for training and the number of training visits provided merits comment. Although it is reasonable to expect that home health clinicians would act on identified training needs by delivering training visits, structural barriers exist. Given the episodic nature of home health reimbursement^{31, 32} and that variable costs are largely driven by the number of visits,²³ home health providers incur lower margins when delivering a greater number of visits per episode.²² This creates a financial incentive to carefully control the amount of time clinicians spend with each patient. Given limited time, clinicians may understandably prioritize direct patient care over training of family and unpaid caregivers. It is also possible that clinicians are providing training during direct patient care visits, but failing to report this training. Regardless, given that family caregiver training needs prompt a greater number of direct care visits, and that the types of visits provided align with the caregiving activities for which the caregiver may be unprepared—e.g., nursing visits and need for training with medication management—it is possible that providing more training visits could be cost-effective at a provider- or system-level.

Home health is not unique in the presence of structural barriers that inhibit family caregiver training and support. Across the health care system, reimbursement does not include time spent interacting with caregivers,^{45, 46} clinicians receive limited education related to caregiver support,⁴⁷ and there are a lack of scalable caregiver assessment tools/training programs specific to care delivery settings.¹ These factors make it difficult for clinicians to incorporate family caregiver training into existing care practices. Greater investment, in the forms of new reimbursement opportunities and funding of small-scale pilot training intervention programs, and the demonstrated value of such efforts for quality and efficiency of care, could help improve access to training. It is unclear whether mandating the provision of caregiver training, without attendant changes in reimbursement, will alter provider

behavior and increase access to this type of support. However, our findings suggest a possible role for caregiver training interventions to contribute to more efficient care delivery.

Limitations

Although this work presents a rigorous approach to measuring the effect of family caregiver need for training on home health care delivery, findings are subject to several limitations. Due to lack of available claims data, our sample does not include Medicare Advantage enrollees, and findings may not be applicable to this population. Measures of caregiver assistance and need for training are drawn from home health clinician reports in the OASIS, the only national source of data on family caregiver factors during a home health episode. Research on the reliability and validity of OASIS items is generally sparse⁴⁸ and no available research tests the psychometric properties of OASIS caregiving measures. While we account for home health patients' post-acute status, we do not adjust for inpatient diagnoses. Finally, propensity score adjustment cannot entirely eliminate the threat of endogeneity and does not account for unobserved potential confounders. However, study findings remained robust during sensitivity analyses designed to probe this limitation.

CONCLUSION

During Medicare home health episodes, older adults receiving family caregiver assistance received a greater number of visits if their family caregiver had an identified need for training. Findings strengthen the growing body of evidence demonstrating that family caregiver factors affect older adults' health care utilization. Providing greater support for family caregivers, in the form of role-related skills training, may affect home health care quality and efficiency.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

Characteristics of Community-Dwelling Older Adults Receiving Medicare Home Health between 2011-2016*

	% (n) or Mean ± SE
Identified family caregiver training needs: [†]	
Household chores	12.7% (126)
Self-care	26.1% (249)
Medication management	27.7% (230)
Patient supervision	19.2% (136)
Proportion receiving any visits and average number of visits, by visit type:	
Total visits	n/a, 16.9 ± 0.47
Nursing visits	90.2% (1,091), 7.2 ± 0.26
Therapy visits	77.6% (945), 8.1 ± 0.32
Aide visits	17.3% (233), 1.6 ± 0.17
Training visits	32.2% (404), 1.4 ± 0.14
Older Adult Characteristics	
Age	79.8 ± 0.29
Male sex	40.5% (468)
Non-white race	19.6% (401)
Medicaid-enrolled	16.7% (250)
<i>Prior to Home Health</i>	
Number of caregivers	1.6 ± 0.06
Receives caregiver help with medication management	16.8% (260)
Receives caregiver help with:	
None	40.1% (421)
Household chores	27.1% (318)
Mobility	7.4% (109)
Self-care	25.4% (369)
Lives alone	34.8% (438)
Fallen in past year	44.6% (547)
Self-rated health:	
Excellent/very good	26.4% (285)
Good	31.7% (381)
Fair/poor	41.9% (551)
<i>During Home Health</i>	
Lives alone	32.8% (400)
Post-acute	71.0% (794)
Receives any respiratory therapy	10.5% (137)
Receives any IV therapy	2.1% (24)
Clinical severity	

	% (n) or Mean ± SE
Low	26.5% (331)
Moderate	41.1% (485)
High	32.4% (401)
Functional impairment	
None/low	17.2% (190)
Moderate	62.4% (762)
High	20.4% (265)
Cognitive impairment	44.1% (605)
Pressure ulcer	3.0% (46)
Wound	25.8% (253)
Home Health Provider Characteristics	
Nonprofit	46.2% (455)

* Data refer to the index home health episode only, and are drawn from National Health and Aging Trends Study (NHATS) and linked Outcomes and Assessment Information Set (OASIS) and Medicare claims data for 1,217 (weighted n=5,870,905) Medicare beneficiaries receiving family caregiver assistance during a home health episode between 2011-2016. Percentages are weighted to account for NHATS survey design and to produce nationally representative estimates.

† Need for training among family caregivers assisting with each activity during the Medicare home health episode. Family caregiver need for training is identified and reported by the home health clinician during the initial admission visit.

Table 2.

Family Caregiver Training Needs and Older Adults' Odds of Receiving Visits during a Medicare Home Health Episode, by Visit Type*

	Home Health Visit Type			
	Nursing Visits aOR [†] (95% CI)	Therapy Visits aOR (95% CI)	Aide Visits aOR (95% CI)	Training Visits aOR (95% CI)
Family caregiver needs training with:				
Household chores	3.38 (1.33, 8.59)	1.01 (0.53, 1.90)	3.54 (1.82, 6.92)	1.18 (0.71, 1.96)
Self-care	1.33 (0.73, 2.43)	1.70 (1.01, 2.86)	2.12 (1.11, 4.05)	1.49 (1.01, 2.21)
Medication management	3.03 (1.06, 8.68)	0.98 (0.54, 1.78)	1.08 (0.59, 1.98)	1.42 (0.94, 2.17)
Patient supervision	1.63 (0.59, 4.54)	1.52 (0.81, 2.82)	1.15 (0.56, 2.39)	1.23 (0.73, 2.05)

* Data are drawn from National Health and Aging Trends Study (NHATS) and linked Outcomes and Assessment Information Set (OASIS) and Medicare claims data for 1,217 (weighted n=5,870,905) Medicare beneficiaries receiving family caregiver assistance during a home health episode between 2011-2016. Models are weighted for propensity score adjustment and to account for NHATS survey design.

[†] Adjusted Odds Ratio. Adjusted for: older adults' sociodemographic characteristics (age, sex, race, Medicaid enrollment), receipt of caregiver assistance (number of caregivers, help with medications, level of functional assistance), and health and functional status (fallen in prior year, self-rated overall health) prior to home health, older adults' health and functional status (clinical severity, post-acute status, functional impairment, cognitive impairment, receipt of any respiratory or IV therapies, presence of ulcer or wound), and home health provider nonprofit status.

Table 3.

Family Caregiver Training Needs and Expected Additional Number of Visits Received by Older Adults during a Medicare Home Health Episode, by Visit Type *

	Home Health Visit Type				
	Total Visits Add'l visits [†] (95% CI)	Nursing Visits Add'l visits (95% CI)	Therapy Visits Add'l visits (95% CI)	Aide Visits Add'l visits (95% CI)	Training Visits Add'l visits (95% CI)
Family caregiver needs training with:					
Household chores	3.24 (0.21, 6.28)	1.11 (-0.22, 2.44)	0.26 (-1.51, 2.04)	1.32 (0.36, 2.27)	-0.08 (-0.68, 0.53)
Self-care	1.65 (-0.65, 3.96)	-0.16 (-1.13, 0.82)	0.97 (-0.32, 2.25)	0.72 (-0.09, 1.52)	0.43 (-0.07, 0.93)
Medication management	0.60 (-1.10, 2.30)	1.06 (0.11, 2.01)	-0.39 (-1.53, 0.75)	-0.23 (-1.04, 0.59)	0.29 (-0.27, 0.84)
Patient supervision	0.06 (-2.26, 2.38)	0.85 (-0.32, 2.03)	-0.77 (-2.53, 0.99)	-0.19 (-0.96, 0.58)	0.09 (-0.46, 0.64)

* Data are drawn from National Health and Aging Trends Study (NHATS) and linked Outcomes and Assessment Information Set (OASIS) and Medicare claims data for 1,217 (weighted n=5,870,905) Medicare beneficiaries receiving family caregiver assistance during a home health episode between 2011-2016. Models are weighted for propensity score adjustment and to account for NHATS survey design.

[†] Holding all covariates at their means. Covariates measured prior to home health include: older adults' sociodemographic characteristics (age, sex, race, Medicaid enrollment), receipt of caregiver assistance (number of caregivers, help with medications, level of functional assistance), and health and functional status (fallen in prior year, self-rated overall health). Covariate measured during home health include: older adults' health and functional status (clinical severity, post-acute status, functional impairment, cognitive impairment, receipt of any respiratory or IV therapies, presence of ulcer or wound), and home health provider nonprofit status.