Help and Care to Older Parents in the Digital Society[1]

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ABSTRACT

This study examines the extent and predictors of employees' help and care to their old parents and aims to contribute to policy development enabling employees to combine full-time work and caregiving to parents. Analyzing responses from 3332 Norwegian employees aged between 45 and 67 years with at least one living parent, we identified frequencies of different help and care types and tested competing predictors. Assistance with digital technology was frequent, and various types of practical support were common, but personal care provision was rare. Parents' health and parents living alone were substantial predictors. Public home care services seemed insufficient and were associated with employees providing more help and care. The findings emphasize the family as a comprehensive care provider when the welfare state falls short. The study concludes that adult children play a critical role in helping older people cope with limited public services and challenges posed by the digital society.

Introduction

An aging society increases the need for policies that allow employees to balance full-time work and caring for their ageing parents (NOU 2011). The aim of this research is to contribute to the development of such policies by investigating the extent of informal help and care provided by employees to their older parents in need. The study uses a survey of Norwegian employees aged between 45 and 67 years with at least one living parent (*N* = 3332) to assess a broad range of specific forms of help and care provided to parents, including support with the use of digital technology. To our knowledge, no previous quantitative research has investigated the extent of assistance with digital technology by adult children to their old parents. Given the increasing importance of digital technology in modern society, this form of assistance is likely to be crucial.

An increasing gap between supplies and demands for elderly care

Europe's populations are rapidly aging (European Commission 2020; Eurostat 2021). This trend is also evident in Norway, where the proportion of people aged 67 years

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The article has supplemental material with detailed results and code for analyses.

or older is expected to increase from 15% in 2021 to 26% in 2060 (Meld. St. 14 2020–2021). Meanwhile, the proportion of people between 80 and 89 years is expected even to triple (Hjemås et al. 2019; Statistics Norway 2022) and the proportion of over 90 years to increase almost fivefold (Statistics Norway 2022).

Even the current proportion of older people in Europe is straining the health and social care services (European Commission 2020; Eurostat 2021), and this challenge will only intensify. According to Statistics Norway (Hjemås et al. 2019), the required person-years in health and social care sector of municipalities is projected to increase from 310,000 in 2017 to 415,000 in 2035. The two largest groups in these services – nurses and health care workers–will be in particularly high demand.

A decline in the number of family caregivers

At present, the responsibility of providing long-term care for older people in European countries is shared between the family and the welfare state (Herlofsen & Brandt 2019; Vangen 2021). Even in Norway, where public health and social care services are extensive, families play a crucial role in providing help and care to older people, with approximately 40% of person-years involved in help and care to older people and other adults being provided by family members (Hjemås et al. 2019; Holmøy et al. 2016). However, governing authorities now suggest that families will need to increase their informal help and care to ensure that older people receive the help and care they need [Meld. St. 15 (2017–2018)]. It is not obvious that families will be able to provide the necessary care. The so-called Parent Support Ratio, which is the ratio of the number of people over age 85 to the number of people aged 50–66 years, is projected to go from 1:10 in 2020 to 1:4 in 2050 [Meld. St. 29 (2012–2013)]. At the same time, the working-age population is set to decline substantially (Eurostat 2021). As a result, government authorities are putting pressure on people to work full-time until retirement age [Meld. St. 14 (2020–2021)]. However, such full-time work might reduce family members' ability to provide help and care to their old family members.

Factors that predict help and care for old parents

Numerous studies have examined the role of family members in providing care for older individuals (e.g., Abrahamsen & Grøtting 2022; Bauer & Sousa-Poza 2015; Gautun & Bratt 2017; Jolanki et al. 2013; Kröger & Yeandle 2013; Lilly et al. 2007; Naldini et al. 2016; Vangen 2021). Typically, when older people reside with a spouse or partner, the partner assumes the primary caregiving role (e.g., Gautun et al. 2012). However, in cases where older individuals are widowed or live alone for other reasons, their children typically serve as the most important caregivers (Herlofson & Ugreninov 2014; Romøren 2004).

The type of assistance given by adult children to their aging parents varies across countries. In Norway, the most common form of assistance provided by adult children is practical help, while personal care by helping parents with dressing, personal hygiene, eating, or using the toilet is relatively rare (Gautun Bratt 2017; Gautun & Hagen 2010; Vangen 2021). Financial support for old parents is almost non-existent. In countries

where public care services are less available, caregivers tend to provide more personal care (Vangen 2021).

Research has shown that various factors related to the parent's situation, particularly their health (Gautun & Bratt 2017; Romøren 2004), strongly predict the type and amount of help and care provided by adult children. As mothers tend to live longer than fathers, they generally receive more assistance from their adult children, while fathers may be assisted by their younger partners (Gautun & Hagen 2010). Additionally, research shows that adult children are more likely to provide care to parents who live in their own homes rather than in nursing homes (Gautun & Bratt 2017; Løken et al. 2017). Previous research also suggests that the geographical distance between the adult child and the parent also affects help and care provided (Gautun 2003).

However, recent research in Norway has uncovered a previously unrecognized association between older parents receiving public care services in their own homes and *increased* help and care from their children (Gautun & Bratt 2017). While professional home care is commonly given to older people with a need, it appears that such professional help alone is insufficient. Paradoxically, professional home care services seem to predict their adult children providing additional help and care. This finding will be further investigated in the present research, which seeks to replicate this association using a new, independent sample of children with aging parents.

Research conducted internationally and in Norway indicates that there are gender differences in the extent of help and care provided to older parents. According to Herlofson and Ugreninov (2014), daughters typically provide more help and personal care to their parents than sons do. Specifically, daughters tend to provide care for a longer period and are more often the sole caretaker for a parent. In contrast, when a son assumes the main responsibility for providing care to a parent, he usually receives assistance from other family members (Herlofson & Ugreninov 2014; Romøren 2004). However, studies applying more detailed measurements qualify these conclusions on gender differences to some extent (e.g., Gautun 2003; Gautun & Bratt 2017; Romøren 2004). These studies have found that whereas daughters more often provided practical assistance with tasks such as cleaning, doing laundry, and other household chores, sons more frequently provided practical help with tasks like home repairs, gardening, snow removal, and outdoor maintenance. Yet, even these studies confirm that daughters typically provide more personal care to their parents than sons do, for instance with tasks such as helping a parent getting in and out of bed, getting dressed, bathing, toileting, or feeding.

As older parents' need for help and care tends to increase with age, the amount of help and care provided by daughters and sons tend to increase as they age (Gautun 2003). Previous research has indicated that help and care to parents is provided mainly by adults who are between 45 and 60 years old (Phillips et al. 2002). Help and care to parents may also continue long after the caregivers turn 60. A 2007 Norwegian survey found that maximum care was provided by daughters around the age of 62 (Gautun & Hagen 2010). As older parents continue to live longer, the duration of providing help and care to them is expected to increase further. Currently, 44% of Norwegian adults between the ages of 55 and 67 years have at least one living parent[1], and this number is expected to increase in the coming decades. Yet for people in full-time employment, balancing work and caring for a parent can be a significant challenge. Some recent studies

suggest that Norwegian employees who work part-time (less than 32 hours a week) provide more help and care to their parents (Arnesen 2020; Vangen 2021).

Help with using digital technology

Earlier research in Norway shows that it is quite common for adult children to offer various forms of practical help to older parents (Gautun 2003; Gautun & Bratt; Vangen 2021). The present research highlights an emerging form of practical help that now may be necessary for older parents: assistance with utilizing digital technology.

Digital technology has a profound effect on modern societies, giving rise to what is referred to as a 'digital society' (OECD 2019). Many interpersonal interactions and information-seeking activities now require the use of computers, tablets, or smart phones to access online services (Komp-Leukkunen et al. 2022). The Nordic countries and New Zealand are leading the transition toward digitalized societies (OECD 2019), with most people in the Nordic countries now using digital devices (Bjønness et al.; Klausen 2022; Polia et al. 2022; Valkama & Jolanki 2022). Even using public transportation often requires purchasing tickets online with smartphones. However, research in the Nordic countries uncovers weak digital skills among individuals over 80 years of age (Bjønness et al. 2021; Klausen 2022; Polia et al. 2022; Valkama & Jolanki 2022). Little is known about how the digital society affects the care provided by adult children to their older parents. In this study, we explore whether employed adult children assist their parents in navigating the digital society.

Today, residents of Norway are expected to log in to a website (helsenorge.no) to communicate with health services for tasks such as booking appointments with doctors, accessing their own patient records, or ordering a COVID-19 test or a COVID-19 certificate. Additionally, interacting with public services, banking (e.g., paying bills), and purchasing items increasingly depend on digital technologies (Bjønness et al. 2021). Consequently, research on care for older parents needs to consider new forms of assistance for them. Navigating a digital society will be challenging without access to a computer, tablet, or a smartphone, and utilizing these modern technologies demands proficiency in their use.

While health authorities promote digital communication technologies as a solution to the challenges posed by an aging population (Luchauh 2022), research in Norway indicates that nearly one-third (30%) among those aged 80 years and over do not use any digital devices at all, and few are able to use such tools effectively (Bjønness et al. 2021). Consequently, many of the oldest individuals need assistance in using new digital technologies to interact with government agencies or health and care services. Yet, their adult children might not always be able to assist. Research indicates that employees aged 60 and over often have less proficiency in using digital technologies than younger counterparts (Bjønnes et al. 2021). We expect that employees over 60 will provide less assistance with using digital technologies than younger employees do.

Bjønnes et al. also found that employees with lower education and lower income levels had weaker digital skills compared with highly educated and high-income employees. However, they found no difference between female and male employees.

Little is known about the extent to which adult children assist their old parents in using digital technologies to interact with various services, as well as which children

provide such help. To our knowledge, the current study is the first to investigate the degree to which children are helping their older parents with digital technology usage, and how such assistance varies depending on factors related to employees' socioeconomic status.

Potential differences across industries

The present research also considers possible differences among employees depending on the industry in which they are employed. Do employees in certain industries provide more help than those in others? One might anticipate differences in help and care for parents across industries, given variations in workplace gender composition, education levels, labor relations such as collective agreements or the proportion of unionized staff, and cooperation agreements with public authorities. We are not aware of any previous research that has investigated such differences across industries. Consequently, the present research will employ an exploratory approach to examine potential disparities among industries.

The Current Research

An increasing number of employees will need to provide help and care for their aging parents. The current research aims to identify variables that can predict which employees are more likely to provide help and care to their parents. We utilize comprehensive measurements of various forms of help and personal care, including assistance with digital technology usage.

Our analysis will test several hypotheses. However, some assumed associations do not need to be explicitly formulated as hypotheses, as they are sufficiently documented in earlier research:

(1) Assistance (practical help or personal care) to parents increases with age among employees, even for those over 60 years old.
(2) Daughters provide more practical help and personal care to their old parents than sons do, but these gender differences are moderate, and sons provide more help with home repairs and maintenance tasks.
(3) Employees' assistance to their parents is strongly associated with parents' impaired health.
(4) Employees are more likely to assist their older parents if the parents live alone, as opposed to living with a partner.
(5) Employees provide less help and care to the parent if the parent receives long-term care in an elderly institution (compared to parents living in their own homes).

Older employees are more likely to provide help and care to their parents than younger employees are, as older employees tend to have older parents. However, since research finds weak competence in using *digital technology* among employees over 60, we expect that helping with the use of digital technology deviates from the overall association between age and other forms of help:

H_1: Assistance involving the use of digital technology will increase with employees' age, but level off after the age of 60.

Variables associated with the parent's need for help are likely to be strong predictors of employees' help and care to a parent; examples are the parents' health and whether they live alone. While having a parent in a nursing home is probably a predictor of less informal help and care by the employee, we do not expect the same association to be evident for home services that parents receive in their own homes:

H_2: Employees provide more care to parents if the parents receive home care services.

While research shows moderate gender differences in help and care to older parents, we expect these gender differences to be negligible in assistance with the use of digital technology:

H_3: There will be no substantial difference between daughters and sons in helping older parents with the use of digital technology.

Research has found that higher education and higher income predict higher competence in the use of digital technology. This finding in earlier research may suggest that highly educated employees and high-earning employees provide more assistance with digital technology than do lower-educated employees:

H_4: Higher education and higher income predict more assistance with the use of digital technology.

The ability of adult children to provide assistance to their old parents will depend on how easy it is to perform such assistance. Previous research has suggested that *part-time workers* may be more likely to provide help to their parents. In this study, we test this prediction by applying either a dichotomous variable of part-time/full-time employment, as used in earlier research, or a more detailed measurement of working hours. Additionally, we propose a separate hypothesis that the distance between the employees' home and the parent's home is a substantial predictor of assistance provided.

H_5: Employees in part-time work provide more help and care to parents than employees in full-time work do.

H_6: The closer employees live to their parents, the more assistance they provide.

Crucially, the ability of the various predictors to explain help and care cannot be determined by simple bivariate associations. For instance, understanding the association between the assistance provided and distance to the parent requires that the analysis incorporates other predictors, such as the parent's health, whether they live alone, or whether they live in a nursing home. Therefore, we develop models with multiple predictors, and we test different sets of predictors. Starting with variables assessing the parents' situation (such as the parents' health and services received) in the first model, we

add characteristics of the employee in the second model (such as education and whether employees work parttime). We then add travel distance between employee and parent as a further predictor in a third model. Thereby, we investigate how explained variance and regression weights for various predictors might change as we add further covariates to the analysis. In the fourth model, we extend the analysis by also considering potential *differences across industries*. Since we are not aware of earlier research investigating such differences, this last stage of the analysis is exploratory.

Data and Method

Sample

The present study used data from a nationwide, web-based survey conducted in Norway in March and April 2022. Data collection was performed by Kantar AS (https://kantar. no/) on behalf of Norwegian Social Research (NOVA) at Oslo Metropolitan University as part of their Gallup Panel, which comprises approximately 40,000 individuals aged 15 years and older who have agreed to participate in surveys. The Gallup Panel was designed to be representative of the entire adult population in Norway and includes sampling weights.

The questionnaire module used in the present study was developed for the research project 'Combining Work and Care for Older Parents' funded by The Research Council of Norway (project no. 3154428) and aimed to survey employees between the ages of 35 and 67 years who had at least one living parent. The survey was distributed by Kantar to 14,427 people in the target population, of whom 6054 completed it (a response rate of 42%). Among these, 1393 were not currently employed and were excluded from analyses. In total, 4661 were in the actual target group for the present research: employees in work and between 35 and 67 years and having at least one parent alive. After initial plotting of the data, we focused on a subset of the original sample – restricting analyses to employees at least 45 years old and having at least one living parent (3332 employees).

Measurements

The present study utilized items from previous surveys on combining work and care for older parents (Gautun 2003; Gautun & Bratt 2017; NorLAG 2008,2012; Opinion 2021). These items were developed further by the researchers at 'Norwegian Social Research (NOVA) and Work Research Institute (AFI)' at Oslo Metropolitan University working on the project 'Combining Work and Care for Older Parents'. The questionnaire was reviewed by a stakeholder reference group consisting of representatives from Norway's largest labor union (LO), the largest employers' organization (NHO), and Centre for Development of Institutional and Home Care Services in the capital Oslo. This reference group also included the Centre for Senior Policy in Norway, a center of excellence which works to develop senior policies for working life as well as stimulate research on policies for a more inclusive working life. The center contributes to cooperation on senior issues with authorities, businesses, and social partners. After the survey

was completed, Kantar merged the data with register data on the respondents' background (these are registered as part of the Gallup Panel).

Help and personal care to the parent

We assessed *help and care during the last six months* with separate items on assisting a parent (all with a 5-point ordinal response scale: daily, weekly, monthly, less frequently than monthly, or never). The questionnaire included the following items and the employees responded for help/care to mother and for father separately:

(1) Help with using new technology (e.g., handling smartphones, online banking, digital information from public authorities)
(2) Assisting the parent with paying bills, banking, and managing finances
(3) Had phone contact with public offices and/or services on behalf of the parent
(4) Cleaning, laundry, and other household chores
(5) Repairs, gardening, snow clearing, or outdoor maintenance work on the house
(6) Buying groceries
(7) Transportation
(8) Activities outside the home
(9) Physical activity, exercise, workouts
(10) Accompanied the parent to the doctor, a hospital, or other healthcare provider
(11) Financial support
(12) Assisting the parent getting in or out of bed
(13) Assisting the parent dress or undress
(14) Assisting the parent with personal hygiene
(15) Help the parent use the toilet
(16) Help the parent eat

The last five items represent personal care, so we refer to the other items as practical help. Most analyses used the 5-point ordinal scale, as used in the questionnaire items. A few analyses were based on composite scores of several items.

The parent's situation

Several items in the questionnaire asked the employees to report on the parent's situation. *The parent's health status* was measured with items on activities of daily living (ADL functions). ADL is a common measurement for assessing extensive loss of function among people with impaired health and the measures' reliability and validity have been tested in several studies (Romøren 2004). The present research used six classic ADL functions: the need of a parent to receive help with getting in or out of bed, dressing or undressing, personal hygiene, using the toilet, eating, or maintaining physical activity or training. These items used a five-point ordinal response scale: never, less than once a month, monthly, every week, daily. We developed a composite score of these six items (the mean) and used this composite score as a measure of overall health of the parent.

We considered having *parents living alone* a further predictor of help and care by the employee. A few in the sample of employees (55 mothers – less than 1% – and 17 of the fathers) reported living together with the parent; we included such answers as part of the 'parent lives alone' category, since this category was meant to be compared with parents living with a partner or in an institution.

Further, we included items on whether the *parents received public elderly care services* – one item for the parent living in a nursing home and one item for the parent receiving home nursing or other forms of professional assistance within their own home.

Characteristics of the employee

Variables on characteristics of the employees were based on register data: age, gender, level of education, and working hours. Respondents reported on their income measured in Norwegian Kroner with a 9-point scale, from 1 (less than 200,000) to 9 (1,000,000 or more), with an added option to reject answering: 'Do not wish to answer', coded as missing data. We also considered travel distance between the employee and the parent. This variable was based on reports by the employees on a 5-point ordinal scale, with the following alternatives: walking distance, up to 1 hour driving, 1–2 hours driving, 2–4 hours driving, and more than 4 hours driving. The item also included the option to report that if the parent lived abroad, we removed these employees from the analysis. We reverse coded the item on distance between employee and parent.

Industries

Information on which industries the respondents were employed (see Table S2 in the online supplemental material for a list of industries) was collected with register data. To facilitate analyses (reducing the number of predictors and increasing observations within categories), we grouped the many industries into seven groups. This grouping was based on evaluating each specific industry based on whether it was female or male dominated (or had a more equal distribution of female and male employees); whether the industries had established well-functioning agreements between employees and employer; the length of education needed for working in the specific industry; a category for low income and industries with few employee rights (retail, tourism, restaurants); and a separate category for knowledge industries. See the online supplemental material for details.

Analyses

Tests of predictors of help and care used ordered probit regression (for analyses of practical help) and zero-inflated negative binomial regression (for analyses of an index of personal care, which had a preponderance of zeros, i.e., no care). The two forms of regression analysis used Mplus 8.9 (Muthén & Muthén 2017), and analyses with Mplus were assisted by the Stata addon 'runmplus' (Jones 2010). Detailed results are available

in the supplemental material, and the main results are shown with graphics in the article. We use graphics in the article because they have been demonstrated to generally improve comprehension compared to tables (e.g., Kastellec & Leni 2007). Graphics are also used in initial descriptive analyses. The various graphics were developed with R (R Core Team 2019) and the R package 'ggplot2' (Wickham 2016).

Surveys tend to have some degree of missing data among observations included in the research. The current research had a low degree of missing data on the various forms of help and care assessed: up to four cases with missing responses for the various forms of assistance to the mother and up to seven for the various forms of assistance to the father. Among the predictors, income had a moderate number of missing responses: 252 (9.5%) and 158 (9%) for employees 45 years and older with a living mother and father, respectively. Travel distance to the parent also had a moderate number of missing responses (128 and 96), as did the register data on industries where the respondents were employed (47 and 29). We applied multiple imputation to increase the effective sample size and reduce potential bias due to missing values (see Ginkel et al. 2020). Mplus conducted multiple imputation prior to running regression analyses, with the added benefit that we ensured having the same sample in each of the four models tested. Regression analyses dropped respondents for whom register data did not provide information on which industry they worked. All predictors were normalized prior to analyses, meaning that they had 0 as their lowest value and 1 as their highest value, independently of whether predictors were dichotomous (0 or 1 as possible values), ordinal, or continuous. Thereby, the analysis could compare the relative contribution of each predictor without relying on standardized estimates (which depend on random standard deviations).

Detailed results from statistical analyses are available in the supplemental material, which was developed with Posit's software Quarto (https://quarto.org/), with the help of the R packages 'knitr' (Xie 2021) and 'kableExtra' (Zhu, 2021). All codes for data management and analyses are included in the online supplemental material.

Results

Initial exploratory analyses were conducted on employees aged between 35 and 67, as shown in Figure 1. The figure displays two plots depicting how different forms of help to mothers and fathers varied across the age of employees[2]. Similar plots on personal care for parents are available in Figure S2 of the supplemental material. Overall, employees under the age of 45 provided little help or care to their parents, so *subsequent analyses focused on employees aged between 45 and 67* (N = 3332), consistent with earlier research practices.

All these employees had at least one living parent, 87% had a living mother and 57% had a living father. A large majority (86%) reported providing some form of practical help to a parent in the previous six months (personal care not included), with 55% reporting providing such help monthly or more frequently. Personal care was less common, with 43% reporting some form of personal care to a parent in the previous six months and 15% reporting providing it monthly or more frequently. Detailed tables that also distinguish between assisting mothers and fathers are available in supplemental material, Tables S2 and S3.
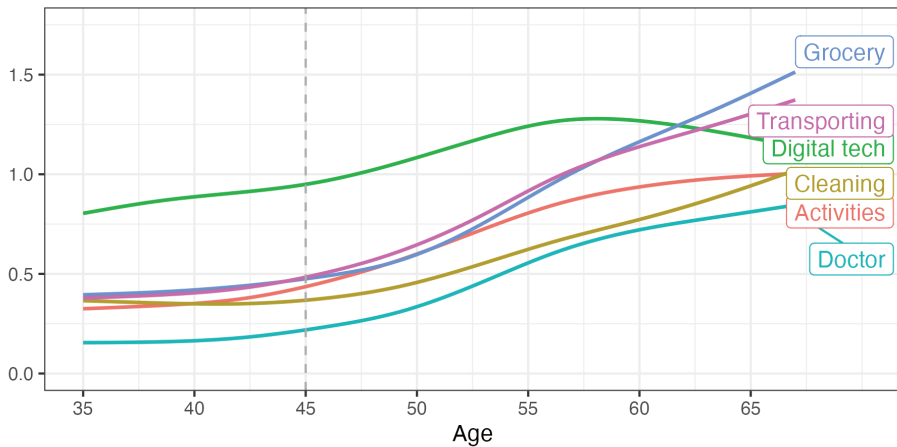
Figure 1 Employees' age and average scores on 5-point scales for various forms of help to (A) the mother and (B) the father – employees with a living parent.

Help to parents across age among employees aged 35 to 67 (scale: 0 to 4)
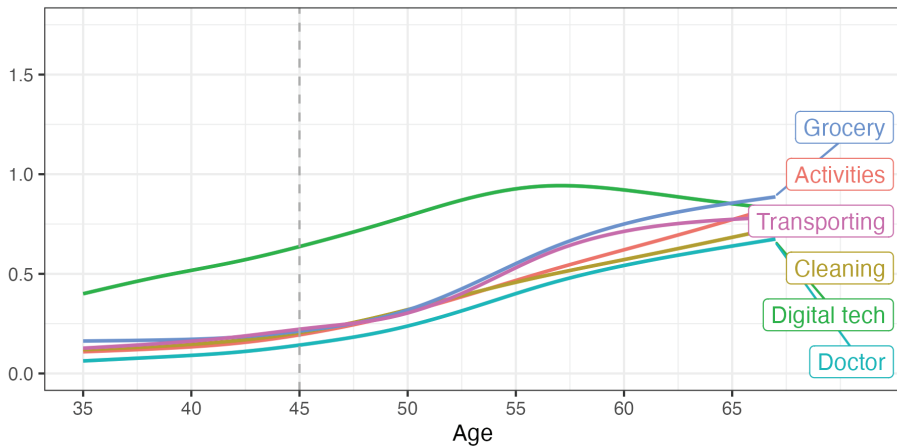The dotted vertical lines at age 45 indicate cutoff for subsequent analyses

A

Help to the mother (if mother was still alive, N = 4149)

B

Help to the father (if father was still alive, N = 3022)

As shown in Figure 1, assistance to parents increased with the age of respondents, except for one category of help: assisting with the use of digital technology. This finding is consistent with Hypothesis 1, as the increase in technology assistance levelled off after the age of 60.

Assisting with digital technology usage was the most common form of help to a parent; 39% of the participating employees aged between 45 and 67 years had provided help with digital technology at least monthly for a parent. Other frequent forms of help were doing home repairs/maintenance (24%) and transportation (24%). Only 7% reported helping a parent do workouts or other forms of exercise monthly or more frequently. Few provided personal care to a parent: 6% reported having helped a parent in or out of bed at least once in the previous six months, and 8% reported having helped a parent dress or undress. The corresponding numbers for helping a parent with personal hygiene, use the toilet, or eat were 5%, 5%, and 4%, respectively.

Predictors of Help and Personal Care to Parents

Figure 2 displays differences (or lack thereof) between daughters and sons in terms of how many of them provided specific forms of help or personal care to their mothers or their fathers at least once a month. Overall, employees provided help more often to their mothers than to their fathers. The data also indicated that personal care and financial support were relatively rare forms of assistance provided by employees.

As evident in Figure 2, approximately equal proportions of daughters and sons provided help at least once a month. The most obvious exception was the item on repairs and maintenance (more often done by sons). Daughters contributed more with other forms of practical help and daughters reported more frequent personal care to the mother than sons did.

Limited differences across industries

We also looked for differences across industries; plots are available in the online supplemental material (Figures S2 and S3). Help and personal care to older parents appeared overall similar across groups of industries; the most noticeable exception was more frequent help with repairs/maintenance among daughters or sons working in primary industries. Additionally, employees in the various industries provided more help to the mother than to the father, the only exception being employees in restaurants, who seemed to provide more frequent help to fathers (see Figure S3 in the online supplemental material).

Tests of predictors with regression analyses

We tested predictors of help and care with four alternative models. Model 1 incorporated variables assessing the parent's situation (such as health and whether they lived alone); in Model 2, we added characteristics of the employee as predictors, and in Model 3, we added travel distance between the employee and the parent. The final model (Model 4) added industries as predictors, incorporated as dummy variables. We focused regression analyses on the most frequent forms of help (i.e., more than 10% providing such assistance at least monthly: helping with digital technologies usage, cleaning, home repairs/maintenance, phoning on behalf of the parent to a doctor or other health service, pay

Figure 2 Percentages over 45 years (with a living parent) helping or giving personal care to the parent at least once a month – separate results for daughters ($n = 1716$) and sons ($n = 1616$).
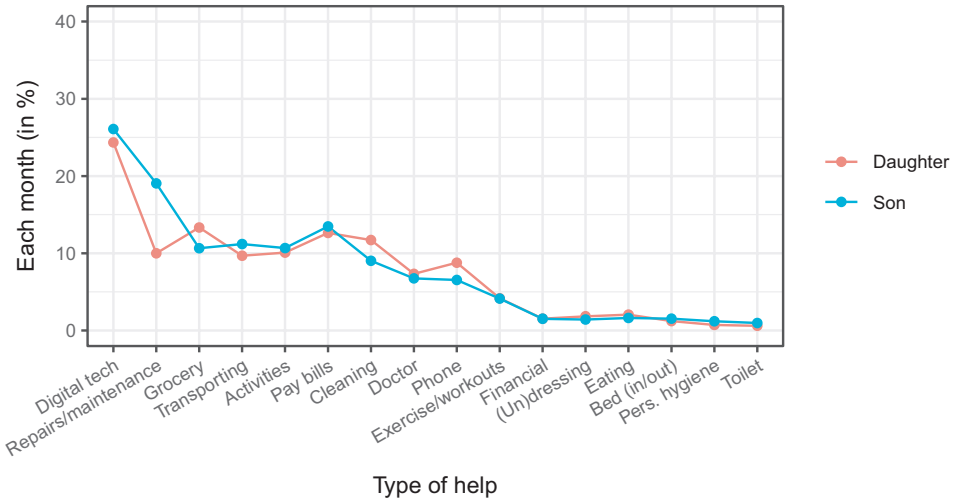
A

Help or care for mother at least once a month
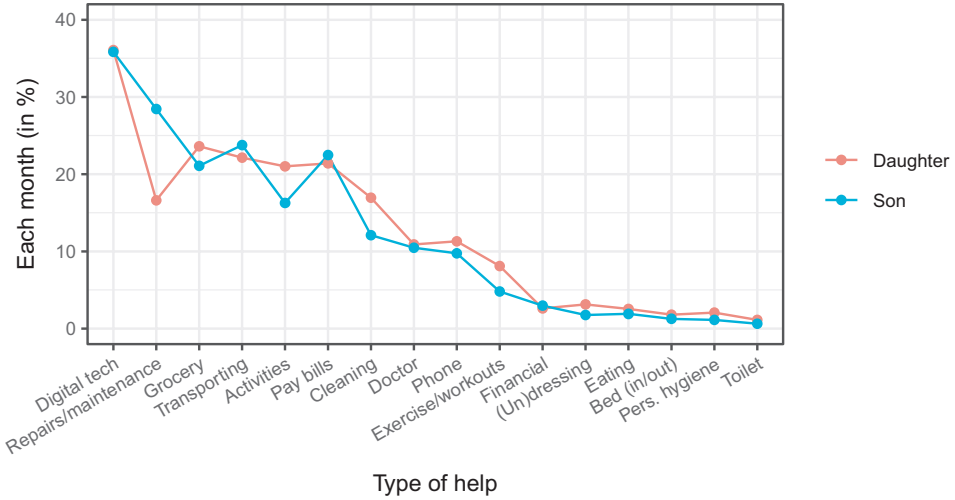
B

Help or care for father at least once a month

bills, buy groceries, transportation, activities outside the home, and follow the parent to the doctor). We used the same four models to explain an index of personal care to parents. Detailed results are shown in Tables S5 to S24 in the supplemental material. Here in the article, we summarize the results.

Using only variables assessing the parent' situation (Model 1) provided R-squared from 0.06 (home repairs/maintenance) and 0.07 (help with digital technology) to 0.26

and 0.25 (phone on behalf of the mother or father, respectively). Adding characteristics of the employee (variables such as education, income, working hours in Model 2) had limited effect on explained variances. In contrast, adding travel distance between the employee and the parent in Model 3 gave a substantial improvement in explained variance. Estimated regression coefficients were only moderately affected by adding new predictors to the analysis. Adding dummy variables of industries in the last model (Model 4) had only a minor impact on explained variance. Only for the small sample of employees in primary industries (n = 33) did the analysis indicate a statistical effect. Employees in primary industries reported providing more help in general.

In the following, we focus on Model 3, which includes all predictors except for industries. Figure 3 displays the results for three frequently provided forms of assistance: help with digital technology, cleaning, and home repairs/maintenance. The six plots in the figure depicts estimated effect sizes and their 95% confidence intervals. The effect sizes are reported with unstandardized coefficients; all predictors were normalized to have scores from 0 to 1, allowing for easy comparison of the unstandardized coefficients in Figure 3.

As shown in Figure 3, and as also evident for the other forms of help (see tables in the supplemental material), employees provided more assistance to their parents if the parents received home care services, which was consistent with Hypothesis 2. It is worth emphasizing that this estimated effect remained even though the model included a variable assessing parents' health as a covariate, estimated as a loss of ADL functions. Additionally, as hypothesized (Hypothesis 3), there was no substantial difference between daughters and sons in helping older parents with the use of digital technology. However, we found moderate support for Hypothesis 4, which predicted that higher education and higher income would predict more assistance with the use of digital technology. Only education was associated with helping with digital technology. Hypothesis 5, derived from earlier research, that employees working part-time work would provide more help was not supported by our analysis.

Our final hypothesis (Hypothesis 6) was supported, predicting that travel distance between the employee and the parent would explain differences in help and care. Travelling distance to the parent was a substantial predictor of practical help, but not of personal care. As shown in Figure 3, living close to the parent predicted more help with digital technology, and more so than it did for cleaning and repairs/maintenance. Helping with the use of digital technology appeared not to be done remotely.

Other expectations (not formulated as explicit hypotheses as they seemed well established by earlier research) were supported: daughters provided slightly more help and personal care to their parents than sons did; employees' assistance to their parents was strongly associated with parents' impaired health; employees were more likely to assist their parents if the parent lived alone; and employees provided less help and care to the parent if the parent received long term care in an elderly institution. However, the multivariate analyses indicated that income was not in itself a substantial predictor of help or care to parents. In contrast, education moderately predicted help to a parent, specifically helping with digital technology usage, pay bills (which will often have included the use of digital technology), transportation, and buying groceries for the fathers.

Figure 3 Multivariate ordinal regression (Model 3), with predictors of specific forms of help among employee over 45 years of age with a living parent: unstandardized regression coefficients with 95% confidence intervals.
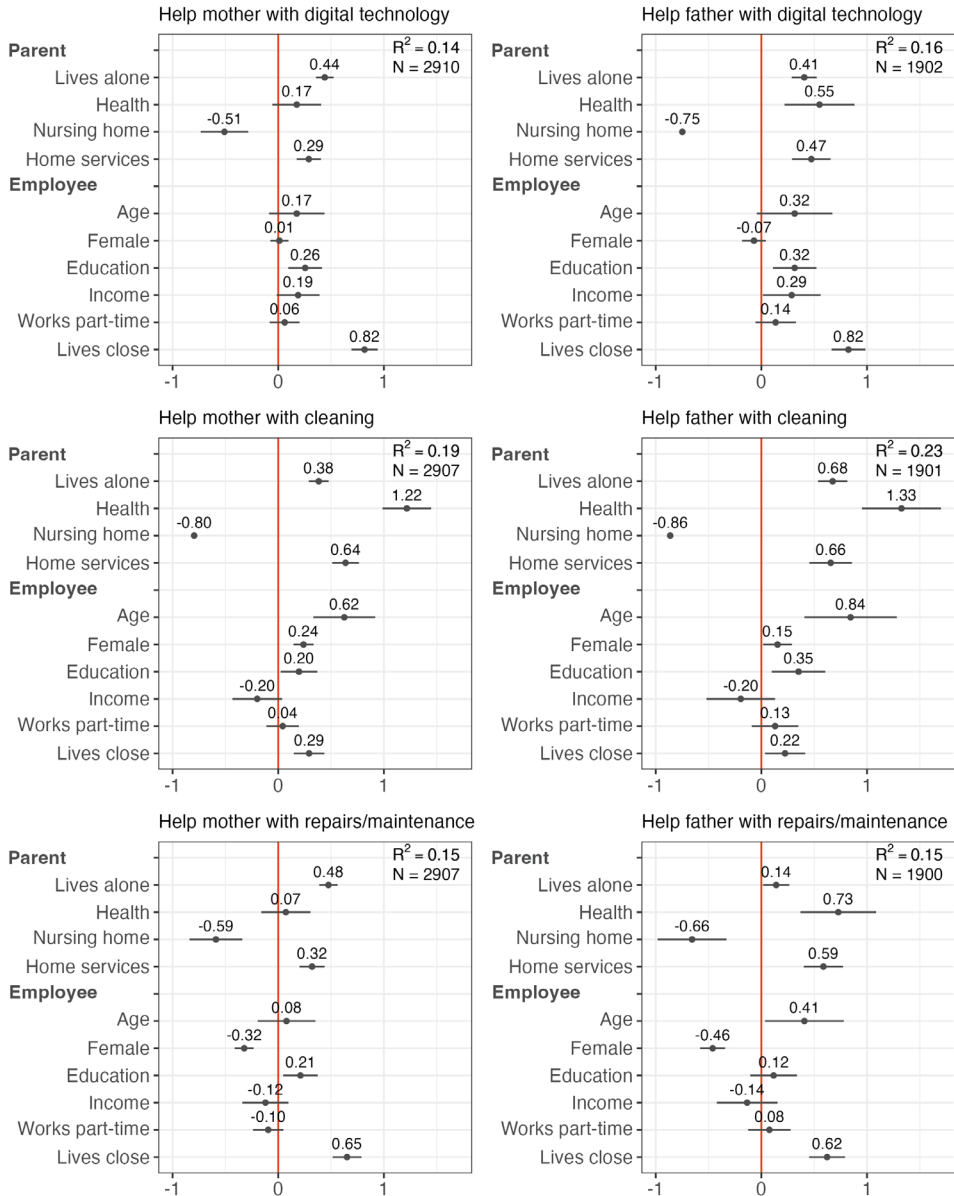
Discussion

Employees older than 45 years often need to provide help or care for their old parents. Such help now also includes assistance with the use of digital technology and the current research suggests that assistance with using digital technology is the most frequent form of help to old parents in a society that depends heavily on digital technology. Also, the weaker a parent's health, the more they seemed to depend on assistance from their adult children with using digital technology.

Various forms of practical help were also relatively common, but in line with earlier research, few employees in our sample provided personal care to their parents. More practical help and personal care was provided to mothers than to fathers. The analysis confirmed the association between increasing age among employees and increased help to a parent. However, as predicted, this association between employees' age and helping parents was non-linear for digital technology: help with digital technology increased with age until it broke off when employees were approximately 60 years old.

We confirmed that the health of the parents was a substantial predictor of informal help and care from their children. Also, parents living alone received more help and care from the employee, and conversely, old parents receiving long-term care in an elderly institution received less informal help and care from their daughters and sons than parents living in their homes. The analysis also corroborated that living close to the parent was a substantial predictor of help and care. However, the distance between employees and their parents did not explain differences in personal care provided to parents. Notably, the current analysis replicated an earlier finding (Gautun & Bratt 2017) that help and care services provided by the municipalities in older people's homes were associated with *more* rather than less help and care from daughters and sons. This conclusion was held, although the analysis included a measure of parents' health (ADL functions) as a covariate.

Differences between daughters and sons were generally small, but daughters provided somewhat more help to their mothers than sons did. Sons reported more repairs and maintenance, while daughters reported more frequent help with cleaning and other household chores (which is consistent with earlier research, e.g., Gautun 2003; Gautun & Bratt 2017; Romøren 2004). The employees' socioeconomic status and whether they worked full-time or part-time appeared overall to have little effect on help and care provided to parents. However, education was a moderate predictor of assistance to parents, for instance with digital technology usage. We found limited evidence of differences across industries, except for employees in primary industries providing more practical help and more personal care.

Implications

Since the 1980s, research in Norway has shown that practical help is the most common form of assistance provided by adult children to their old parents. Examples have included cleaning, washing clothes, repairs, gardenwork, snow clearing, and house maintenance outdoors (Gautun 2003; Gautun & Hagen 2010; Lingsom 1997; Romøren 2004; Vangen 2021). The current research has identified a new trend: digital societies substantially alter daughters' and sons' role as caregivers by requiring them to help parents with the use of digital technology.

Assistance with digital technology was the most common form of help. This finding is not surprising given that many people aged 80 or older have no or weak competence in the use of such technologies (Bjønnes et al. 2021). The children of old parents now play a crucial role in helping older people overcome the obstacles posed by the digital society, where for instance using public transport, accessing information, communicating with public agencies, or banking depends on using digital devises connected to the internet.

Assistance with using digital technology levelled off after the age of 60, probably because of weaker competence in using digital technology in older compared to younger employees (see Bjønnes et al. 2021). This interpretation would predict that many employees currently under 60 will go on to provide assistance with digital technology usage for parents even when they themselves are well above 60 years old. Consequently, the observed levelling off in help with digital technology after the age of 60 among employees may not continue as younger cohorts of children become older.

Another important conclusion was that we were able to corroborate our earlier finding (Gautun & Bratt 2017) that professional services by the municipality in older people's homes were associated with more help and care from their adult children. Replicating this finding from earlier research is an important part of the current study: It seems that the analysis has identified a mismatch between professional home care services provided to older people and their actual needs when they live in their own homes. Apparently, this discrepancy between the need for help and actual help and care provided by professionals requires adult children to step in – even with personal care when they themselves are in full-time employment. Finding that adult children seemed to compensate for insufficient professional home services is consistent with Hagestad's (1999) notion of the family as an 'omnibus institution' that provides help and care when the welfare state fails to deliver. We draw a similar conclusion for employees' frequent help to parents with the use of digital technology. The digital society demands competence in the use of digital technologies, but professional care services may not be able to help with the use of digital technology and therefore the children step in, providing help and care not covered by the welfare state.

Living close to the parent predicted more practical help. In contrast, living close was not a predictor of personal care. Apart from the fact that only few provided personal care and many old people with strong needs will live in nursing homes, one explanation for the lack of an association between geographical distance and personal care might be that urgent needs of a parent would easily trump the inconvenience of long trips.

Overall, the association between living close and providing practical help remains. This statistical association does not necessarily reflect a strong causal effect is from living close to providing practical help to a parent. A causal effect from living close to providing more help may be more plausible than the reverse causality, yet an alternative explanation could be that employees living near their parents tend to have stronger emotional attachments to them; geographical proximity between the adult child and the old parent might reflect emotional closeness. Although this alternative interpretation may seem reasonable, it is not supported by earlier research. Previous studies in Norway have found no substantial link between being emotionally attached to an old parent and the extent of assistance offered to them (Daatland 2004; Gautun 2003).

The present study shows that employees in primary industries provided substantially more assistance to their parents than those in other industries. One possible explanation is that people in rural areas are often hesitant to seek public assistance, be it

as patients or as relatives of patients (Devik & Hellzen 2013). Also, individuals from agricultural societies tend to uphold more traditional family norms compared to those living in urban societies (Inglehart & Baker 2000). In addition, individuals working in primary industries may possess more skills for home repairs and other forms of practical help. However, we note that the sample of employees employed in primary industries was relatively small (*n* = 33). A larger sample might alter the current finding on exchange of assistance across generations.

Future Research

By employing broad multi-item measurements of help and care provided to parents, the current research goes beyond previous studies, ensuring that various types of assistance are assessed. Another strength of the current research is the inclusion of an item on helping with the use of digital technologies. We are not aware of earlier quantitative research addressing this aspect of help and care for older parents. Our research highlights that future research will benefit from assessing this type of assistance, as using digital technology has become a crucial component of adult children's assistance to their parents, especially when the parent is in poor health. Future research may more in depth analyze the nature of such help with digital technology.

A limitation in the present research is that we have relied on cross-sectional data, with self-reported frequencies of helping an older parent. We have limited ability to identify causalities with the current data. Future studies may advance this research field by using longitudinal data combined with multi-item measurements of variables and analyze such data with appropriate statistical techniques.

A further limitation is that the current analyses have focused on the frequencies of helping older parents and not considered the consequences for the employees themselves when they provide help and care to parents. Future research may investigate how providing help and care to a parent affects the employees, and how it affects workplaces when employees need to assist their parents. If adult children increasingly must provide help and care to their parents, these demands may put a substantial burden on employees when they try to juggle the needs of their parents and the requirements by their workplace (Gautun & Bratt 2017; Phillips et al. 2002). Future research may follow up questions such as: Is it easier for employees at some industries (or at some workplaces) to combine full-time work and care for parents? Are some industries or workplaces more willing to facilitate an employees' need to provide help and care for their parents? And how would such flexibility provided by the workplace affect the employee's wellbeing and ability to remain full-time in the labor force? And finally, how can labor market policies decided by authorities lessen adverse effects of help and care to parents on employees' health and labor marked participation?

Conclusion

We have used comprehensive survey data to investigate employees' help and care to old parents. Older people often develop a need for help and care, be it because of poor health or because they live alone, and such needs among older parents are substantial

predictors of children's help and personal care. Assistance with the use of digital technology was the most frequent form of help and has become a central aspect of employees' help to their old parents with poor health seem particularly dependent on their adult children to manage modern technologies.

Overall, the findings underscore the family as an omnibus institution providing help and care that the welfare state fails to deliver either due to limited capacity or because needs are unacknowledged. The analysis also reveals the insufficiency of professional care services provided by municipalities to older people in their homes. As populations age, welfare states are likely to struggle even more with delivering the necessary help and care to older people. This observation raises a vital question for future research and policies alike: Will adult children in employment be able to provide the necessary help and care to their aging parents?

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Notes

[1] Statistics received from The Division for population statistics, Statistics Norway, 8 April 2022.

[2] The plots are meant to provide intuitive illustrations of tendencies across age, using average scores on ordinal scales. Later analyses estimated these items as ordinal.