

Social support for informal caregivers of spouses and parents(-in-law) aged 60 years and older during the COVID-19 pandemic: Findings from a representative German Online Survey

Dr. Larissa Zwar*, Prof. Hans-Helmut König, and Prof. André Hajek

Department of Health Economics and Health Services Research, University Medical Center Hamburg-Eppendorf, Hamburg, Germany

*Corresponding author: Dr. Larissa Zwar, Department of Health Economics and Health Services Research, University Medical Center Hamburg-Eppendorf, Martinistr. 52, 20246 Hamburg, Germany (E-mail: l.zwar@uke.de).

Abstract

Objectives. We analyzed whether spousal and adult child caregivers of older adults differed from each other and from non-caregivers in terms of the social support available to them during the COVID-19 pandemic, whether available support differed by gender, and whether the perception of pandemic restrictions moderated these differences.

Methods. Participants (≥ 40 years) were randomly drawn from the population-based German online panel forsa.omninet. Between 4th and 19th March 2021, 2520 non-caregivers, 337 adult child caregivers and 55 spousal caregivers were questioned about social support, perception of pandemic restrictions, health and sociodemographic information. Adjusted regression analyses and moderator analyses were conducted.

Results. Adult child caregivers had higher social support from family and friends than non-caregivers, and more support from friends than spousal caregivers. Spousal caregivers had less social support from friends compared to both groups. The perceived restrictions of the pandemic moderated the differences in support from family and friends between spousal caregivers and non-caregivers, and the differences between spousal and adult child caregivers in support from friends. Gender moderated the difference in support by friends between caregiving and non-caregiving wives and sons(-in-law).

Discussion. Informal caregivers seemed to have a supportive informal network during the pandemic. However, spousal caregivers only had similar levels of support as adult child caregivers if they strongly perceived restrictions of the pandemic, and had the lowest support level of all three groups – in particular from friends. Thus, spousal caregivers may benefit most from support actions, and these should focus on their wider social network.

Keywords: social support; informal caregiving; spouses; adult children; older adults; COVID-19

Introduction

The COVID-19 pandemic has impacted the daily life and wellbeing of everyone (Benke et al., 2020). Still, some groups have been affected more, such as informal caregivers, who are caring for relatives, friends or neighbors with care needs (Beach et al., 2021; Bergmann & Wagner, 2021). This study focuses on this group and their social support during the COVID-19 pandemic.

The stress process model of informal caregiving and the role of social support

Before the COVID-19 pandemic started, informal caregiving had already been complex. While positive experiences have been reported by informal caregivers (Yu et al., 2018), they have also often reported poorer wellbeing (Bom et al., 2019; Zwar et al., 2018). Pearlin et al. (1990) describe the stress process of informal caregiving and its consequences for wellbeing of caregivers in their model. They illustrate that caregiving-related stress outcomes can be influenced by contextual and intrapsychic factors and include a factor that can reduce stress and prevent worse outcomes - *social support* (Cohen & Wills, 1985; Lazarus & Folkman, 1984; Pearlin et al., 1990; Verbakel et al., 2018).

Social support can affect the stress process in two ways (Cohen, 2004; Cohen & McKay, 1984; Cohen & Wills, 1985). According to the *main effect* hypothesis, social support, in terms of a large social network provides diverse positive experiences and affirmation of one's self and thereby has a stabilizing effect. This can prevent situations from becoming stressful. The *buffering* hypothesis posits that social support can help throughout the stress process, such as preventing or reducing a stress reaction. For example, a situation can be perceived as less threatening if the person perceives available support. The buffering hypothesis has been integrated into this stress process model (Pearlin et al., 1990; Verbakel et al., 2018) and a breadth of research supports the relevance of social support for health and wellbeing of informal caregivers (Del-Pino-Casado et al., 2021; Sibalija et al., 2020). We assume that this stress buffering effect of social support is of particular importance during the pandemic due to the additional difficulties it added to caregiving (e.g., more caregiving time and work-family role conflicts (Bergmann & Wagner, 2021; Rothgang & Wolf-Ostermann, 2020; Zwar et al., 2021)). Thus, it is important to analyze the level of social support informal caregivers experienced during the COVID-19 pandemic. This will extend our understanding of the caregiving situation during the pandemic and provide a basis to be better prepared in future (health) crises.

Social support during the COVID-19 pandemic

Before the pandemic findings were mixed regarding quantity and quality of social support among informal caregivers in comparison to non-caregivers or before becoming caregivers (Ekwall et al., 2005; Sibalija et al., 2020; van Roij et al., 2019). During the pandemic we expect lower social support among informal caregivers compared to non-caregivers due to the following reasons. Not only was formal support (e.g., ambulatory or home care) reduced (Giebel et al., 2021; Lightfoot et al., 2021; Lorenz-Dant, 2020; Rothgang & Wolf-Ostermann, 2020), worries about infecting care recipients or being infected (and the

resulting difficulties with caregiving (Eurocarers/IRCCS-INRCA, 2021; Zwar et al., 2021)) may have also impacted the availability of social support among informal caregivers. First findings lend support to this assumption by indicating reduced social contacts (including contacts outside the care-related network) (Rothgang & Wolf-Ostermann, 2020), social participation (Beach et al., 2021), and support networks (Anderson et al., 2021; Budnick et al., 2021; Rokstad et al., 2021) among informal caregivers due to the pandemic. Still, some caregivers reported improved social support (Rothgang & Wolf-Ostermann, 2020) and that the private network was their main and preferred resource during the pandemic (Archer et al., 2021; Eurocarers/IRCCS-INRCA, 2021). This suggests social networks may have mobilized more support during the pandemic. Nevertheless, it is still unclear if caregivers had similar, more or lower levels of social support compared to non-caregivers. It is critical to understand the availability of *social support* from informal caregivers' private network during the pandemic and if this differed from non-caregivers. This will show if informal caregivers were more at risk of the dangers of low levels of social support during the pandemic than non-caregivers.

Moreover, family and friends support may differ. Although they are often analyzed together, they can both be supportive in different ways (Jackson, 1992; Nguyen et al., 2016). For example, non-relatives may be more helpful with family difficulties, especially spouses (Jackson, 1992; Roth, 2020). Research that separately analyzes the perceived social support network of *family* and *friends* among spousal and adult child caregivers during the pandemic is therefore needed. Thus, one aim of this study was to compare the social support received by informal caregivers and non-caregivers in general, by friends and by family during the pandemic.

Social support for spousal and adult child caregivers.

The two primary groups of informal caregivers are adult children providing care for their parents or in-laws (*adult child caregivers*), and spouses providing care for their partner (*spousal caregivers*) (Rothgang & Müller, 2018). Caregiving situations of adult child and spousal caregivers of older adults, as analyzed in this study, are characterized by different personal and situational factors. For example, spousal caregivers invest more time, conduct more care tasks and use more formal support (Broese van Groenou et al., 2013; Pinquart & Sorensen, 2011). They are more likely to be cohabiting with the care recipient, and they are older than adult child caregivers, usually of a similar age as their care recipient (Pinquart & Sorensen, 2011). Previous research indicates differences in social support in both groups. Similar levels of formal support had been indicated for spousal and adult child caregivers, but spousal caregivers had significantly less informal support (Pinquart & Sorensen, 2011). Recent findings support this (Oldenkamp et al., 2016; Rigby et al., 2019). They indicated that adult child caregivers were more proficient in improving their social support. Reasons for losing support differed as well. Among adult child caregivers reduced time and energy to devote to social relationships were given as reasons. Spousal caregivers traced lost support back to their main support being their partner, who was now their care recipient, and to reductions in their shared friends network (Tatangelo et al., 2018). Spouses also ask less for support than adult child caregivers (Broese van Groenou et al., 2013) and have more

difficulties recognizing and accepting their needs (Tatangelo et al., 2018). This is in line with different role expectations: Spousal caregiving can be perceived as marital duty, and expectations of intensive caregiving are higher for them than for adult children (Shirai et al., 2009). During the COVID-19 pandemic, these reasons may influence differences in social support between spousal and adult child caregivers. Thus, social support levels are expected to differ between spousal and adult child caregivers during the pandemic too. This study aims to compare the social support levels of these two main groups of informal caregivers, and compare their level of support to that of non-caregivers during the COVID-19 pandemic.

Gender, social support and caregiving

Research strongly indicates that, in the general population, women have larger and more multifaceted social networks than men (Antonucci et al., 2014; Fuhrer & Stansfeld, 2002; Liao et al., 2018). Among caregivers, however, men ask for, and are offered, more support with caregiving, while female caregivers often provide care on their own and are offered less support (Bertogg & Strauss, 2020; Brown & Chen, 2008; del Rio-Lozano et al., 2013; Eriksson et al., 2013; Zygouri et al., 2021). This was reported especially among spousal caregivers (Bertogg & Strauss, 2020; Brown & Chen, 2008). Therefore, we will additionally analyze whether the expected differences between non-caregivers and different groups of caregivers, in terms of social support, interact with gender.

Relevance of the perceived restrictions by the pandemic

Lastly, many of the contextual and intrapsychic aspects of the stress process of caregiving (Pearlin et al., 1990) have been impacted during the COVID-19 pandemic. The pandemic and the government measures affected, for example, professional care services, educational facilities (e.g. home schooling), and work conditions (e.g., home office) (Bundesregierung, 2020, 2021; Lorenz-Dant, 2020). The measures often changed on short-notice, requiring constant adaption. These *perceptions of pandemic restrictions* may interact with social support and influence how much support was perceived as available, especially among caregivers.

With respect to adult child and spousal caregivers, these restrictions could highlight the support needs among all caregiving groups (as previous research already indicates), as well as limit the aforementioned role expectations of spousal and adult child caregivers (Eurocarers/IRCCS-INRCA, 2021; Rokstad et al., 2021). For example, with stronger perceptions of pandemic restrictions, spousal caregivers may be more willing to acknowledge their need and ask for support from their networks, and may no longer differ in this from adult child caregivers. However, the pandemic differed in terms of the level of risk it posed to individuals depending on age and pre-existing illnesses (Zhou et al., 2020). Spousal caregivers of older individuals can be expected to be part of the high-risk group during the pandemic due to their age, and may therefore withdraw and be excluded more from social contacts, for their own, and the care recipient's, protection. Their network of friends is often part of, or associated with, the high-risk group as well, i.e., having the same risk factors as caregivers or having partners with these risk factors. This could contribute to lower social

support among spousal caregivers, than among adult child caregivers. Findings from Norway support this assumption (Rokstad et al., 2021). Thus, the availability of social support especially from friends may still differ between both caregiver groups during the pandemic even when the perceptions of pandemic restrictions are strong.

Objectives

In sum, social support is an essential factor in buffering the impact of strenuous informal caregiving activity, but levels of support can differ based on who is providing care, and the type of social network. Thus, we analyzed the social support level of adult child and spousal caregivers of adults aged 60 years or older by their general, friends and family network during the COVID-19 pandemic; comparing the levels of social support received by adult child and spousal caregivers of adults respectively, and comparing these groups with non-caregivers. Moreover, we analyzed if these findings differ based on the caregiver's gender. To investigate the relevance of the pandemic for these associations, we analyzed if perceptions of restrictions of the pandemic moderate these associations. The findings will improve our understanding of the social support dynamics during the COVID-19 pandemic and identify which informal caregivers should be prioritized and which support networks should be supported most.

Methods

Sample

Participants were drawn randomly from the online panel forsa.omninet of the social research institute forsa and invited to take part in our online survey. This online panel is a population-based, representative sample of the adult German population and is based on the forsa.omninet panel. Forsa.omninet was recruited via phone (drawn randomly according to the ADM-phone-sampling scheme). The response rate was 53.97%. In our sample we included individuals aged 40 years or older, because the majority of informal caregivers in Europe and the US is in this age (National Alliance for Caregiving & AARP Public Policy Institute, 2020; Verbakel et al., 2017). In total, 3,022 participants were questioned, including 489 who provided *informal care* for a person aged ≥ 60 years during the COVID-19 pandemic, and 2,520 who did not provide informal care (*non-caregivers*). Informal caregivers included 55 *spousal caregivers* (providing care for a spouse), 337 *adult child caregivers* (providing care for their parents(-in-law)) and 89 who provided care for someone else. This study focusses on the groups of non-caregivers, adult child caregivers and spousal caregivers. The Online Survey was conducted between 4th and 19th March 2021 and the questions referred to the period between December 2020 and March 2021. During this time, the second pandemic wave had reached its peak of infections and deaths in Germany (December '20 – January '21) and the third wave had already started (WHO, 2021). All participants gave written informed consent before participating in the online questionnaire. The study was approved by the Local Psychological Ethics Committee of the Center for Psychosocial Medicine of the University Medical Center Hamburg-Eppendorf (Number: LPEK-0239).

Variables

Informal caregiving was measured by asking participants if they helped older individuals (aged ≥ 60 years) with care needs (i.e. relatives, friends, neighbors) in terms of performing any type or number of care tasks at least once per week, for example, personal hygiene, dressing, or household tasks (cleaning, shopping) (yes/no). Additionally, the *number of care tasks* and *caregiving time* (hours per week) were measured as indicators of caregiving intensity. All questions about caregiving referred to providing care during the last three months prior to data collection. *Use of formal care services* (yes/no) referred to use of any home care services (ambulatory services, household help, meals on wheels, shopping help, privately employed caregiver, day or nighttime care, short-term care, prevention care, other).

Social support by family and friends during the pandemic was measured using the social network short scale from Lubben (LSNS-6, (Lubben et al., 2006)), which had good reliability (Cronbach's $\alpha=.81$) in our sample. The scale measures the quantity and quality of the social network of relatives and friends with six items, three items each ask for support from friends or from family (e.g., "How many relatives/friends do you see or hear from at least once a month?"). A general sum score (Range: 0-30) and two separate sum scores for the subscales of friends or family network (Range: 0-15) can be calculated. Higher scores indicate more social support. Individuals with scores below 12 points (general score) or 6 points (subscales) are part of the population that is at risk of isolation (Lubben et al., 2006). The scale has been validated, is commonly used to measure social support (Lubben et al., 2006) and had good reliability in our study (Cronbach's alpha .81).

Perceived restrictions of the pandemic was captured by asking participants to evaluate how restricted they perceived themselves to be in their everyday life due to government measures which were issued to reduce the risk of infection (e.g., contact restrictions, closure and restricted access to schools or care facilities). Participants were asked to evaluate this in general ("Overall, how much did you feel negatively affected or restricted in your daily life by the above measures in the last three months?") and rate this on a scale from 1 to 5 (not at all, a little, moderately, strongly, very strongly).

Sociodemographic information was collected in terms of age, gender, highest level of education, marital status and employment status (for more details see Table 1). *Self-rated health* was measured using a single-item asking participants to rate their own health status (1-5, higher scores indicate better health).

Statistics

Multiple linear ordinary least square regression analyses were calculated with robust standard errors. In the first set of analyses, we compared spousal and adult child caregivers with the reference group of non-caregivers and adjusted for sociodemographic background and self-rated health. We then used only informal caregivers as the analytic sample to compare spousal caregivers with adult child caregivers while adjusting for sociodemographic background, self-rated health, caregiving time, number of caregiving tasks and use of formal care services. Further moderator analyses were conducted by repeating the analyses, first,

including gender and, second, including perception of restrictions of the pandemic as a moderator variable. Robust standard errors were calculated for all analyses. Stratified analysis by gender was also calculated. The proportion of missing values are provided in Table A1 (Appendix A) and were rather low, thus, listwise deletion was used. The tests were conducted two-sided, the alpha level was set at 0.05 and all analyses were conducted with Stata version 16.1 (Stata Corp., College Station Texas).

Results

Descriptive results

Descriptive statistics are provided in Table 1. Non-caregivers were on average 58 years (SD=10.55) and 48.93% were female. Adult child caregivers were on average 56 years (SD=7.72) and 60.24% were female. Spousal caregivers were on average aged 68 years (SD=10.36) and 69.09% were female. Social support was highest among adult child caregivers (M=16.00, SD=4.79), followed by non-caregivers (M=14.74, SD=5.13), and lastly spousal caregivers had the lowest level of support (M=13.12, SD=5.21). Social support from family was similar among all three groups, with adult child caregivers reporting the highest level (M=8.87, SD=2.77) and non-caregivers the lowest level (M=8.07, SD=3.03; spousal caregivers: M=8.18, SD=2.76). Social support by friends was lowest among spousal caregivers (M=5.10, SD=3.14) and highest among adult child caregivers (M=7.10, SD=3.12; non-caregivers: M=6.67, SD=3.25).

Results of the regression analyses

Comparison of non-caregivers with spousal and adult child caregivers

The results of the regression analyses comparing non-caregivers with adult child and spousal caregivers are given in Table 2 (models 1, 4 and 7). Findings indicated that adult child caregivers had significantly higher levels of *general social support* than non-caregivers ($b=1.31$, $p<.001$, model 1) and spousal caregivers have significantly lower support than non-caregivers ($b=-1.90$, $p<.05$, model 1). This was also found for *social support from friends* – adult child caregivers had significantly higher social support ($b=.42$, $p<.05$, model 7) and spousal caregivers had significantly lower social support ($b=-1.53$, $p<.01$, model 7) than non-caregivers. Regarding *social support from family*, only adult child caregivers reported significantly higher social support than non-caregivers ($b=.86$, $p<.001$, model 4), while spousal caregivers did not differ from non-caregivers ($b=-.30$, $p=.424$, model 4).

Comparison between spousal and adult child caregivers

The results of the comparison within the group of informal caregivers are given in Table 3 (models 1, 4 and 7). Spousal caregivers had significantly lower levels of *general social support* ($b=-2.58$, $p<.05$, model 1) and *social support from friends* ($b=-1.87$, $p<.01$, model 7) than adult child caregivers. No significant difference was found between spousal and adult child caregivers in social support by *family* ($b=-.59$, $p=.319$, model 4).

Moderator analyses with perceived restrictions by the pandemic as moderator

Results are given in Table 2 (model 2, 5 and 8) for the first set of analyses comparing non-caregivers with the two groups of informal caregivers, and using perception of restrictions of the pandemic as moderator. A significant interaction effect was found between spousal caregiving and perceived pandemic restrictions with the reference group of non-caregivers ($b=1.93$, $p<.01$, model 2) for the outcome general social support. This interaction effect was also significant for social support by family ($b=.80$, $p<.05$, model 5) and by friends ($b=1.14$, $p<.01$, model 8), each comparing spousal caregivers with non-caregivers. The three significant interaction effects indicate higher levels of social support by family and friends among spousal caregivers, compared to non-caregivers, when they perceived stronger pandemic restrictions. Adult child caregivers did not differ from non-caregivers in general social support ($b=.12$, $p=.630$), support by family ($b=.13$, $p=.433$) or by friends ($b=-.00$, $p=.992$) in dependence on their perception of pandemic restrictions.

Results for the second set of analyses, including only informal caregivers, are found in Table 3 (model 2, 5 and 8). Among spousal caregivers compared to adult child caregivers, a significant interaction effect was found with the moderator perceptions of pandemic restrictions for general social support ($b=1.75$, $p<.05$, model 2) and for social support from friends ($b=1.14$, $p<.05$, model 8), but no significant interaction was found for social support from family ($b=0.65$, $p=.141$, model 5). The significant interaction effects indicate more social support among spousal caregivers with stronger perceptions of pandemic restrictions, reaching a similar support level as adult child caregivers when they perceived the strongest restrictions of the pandemic. Predictive margins to illustrate the significant interaction effects are provided in Appendix A.

Moderator analyses with gender as moderator

Further moderator analyses with gender were conducted. A significant interaction was found between gender (female vs. male) and spousal caregivers compared with non-caregivers ($b=-2.25$, $p<.05$) for support by friends (Table 2, model 9, Appendix A: Figure A3). Stratified analyses (Table 2, model 9 and 10) indicate significant findings related to more social support by friends for male adult child caregivers, compared to male non-caregivers ($b=.71$, $p<.05$), and significant findings related to less social support by friends among female spousal caregivers, compared to female non-caregivers ($b=-2.20$, $p<.001$). Adding gender as moderator to the models comparing spousal and adult child caregivers, resulted in no significant interaction effects (Table 3, models 3, 6 and 9).

Discussion

This study's findings extend our understanding of the social dynamics in the informal care situation among adult children and spouses, who provided care for their older family members (aged ≥ 60 years) during the COVID-19 pandemic. First, they indicate that informal caregivers differed from non-caregivers in terms of support they had in dependence on their relationship. During the pandemic, spousal caregivers had the lowest level of social support, lower than non-caregivers and lower than adult child caregivers. This was mainly due to

lower support from friends. In contrast, adult child caregivers had the highest level of support compared to both other groups, which was due to more support from family and friends.

Findings of lower support among *spousal caregivers* compared to non-caregivers may be the result of a reduced network of friends, as has been indicated by previous research (Tatangelo et al., 2018). During the COVID-19 pandemic, having friends of a similar age meant these friends were also part of the high-risk group. These friends may have withdrawn from social contacts with caregivers even more than they would have withdrawn from other friends - for their own and the caregiver's protection. Additionally, informal caregivers may have themselves withdrawn from their network of friends for self-protection. Previous findings support this (Rokstad et al., 2021). Moreover, friends of a similar or younger age may also have withdrawn for the protection of the caregivers and their care recipients. Still, social support, as assessed in this study, did not only refer to face-to-face interactions or instrumental support, but any kind of contact and support. Thus, other factors may be underlying the lower support levels among spousal caregivers compared to non-caregivers during the pandemic. For example, spousal caregivers may have had more difficulties with identifying and acknowledging their support needs and may have adhered to spousal role expectations of providing care primarily on their own, and did not ask for more support, even during the pandemic (Broese van Groenou et al., 2013; Shirai et al., 2009; Tatangelo et al., 2018). More research on underlying mechanisms is strongly recommended.

However, when taking perceptions of pandemic restrictions into account, the differences in social support among spousal caregivers compared to non-caregivers changed. The level of support among spousal caregivers was higher if they perceived more restrictions by the pandemic, while the level of support among non-caregivers did not change. If the strongest perceptions of pandemic restrictions were reported, spousal caregivers actually had more support than non-caregivers. This further supports the intrapsychic explanations. With stronger perceptions of pandemic restrictions, spousal caregivers may have been more willing to acknowledge their support needs and ask for support. It is also possible that stronger perceptions of pandemic restrictions made it easier to overcome role expectations. In the end, the findings that spousal caregivers received more support, when their perceptions of pandemic restrictions were stronger, is a positive result, as the network was available and ready to provide the support when it was really needed. In future research it would be of interest to compare the reported social support levels with the need for social support and identify unmet needs directly.

Findings for *adult child caregivers* are in line with pre-pandemic findings which showed more support among informal caregivers compared to non-caregivers (Ekwall et al., 2005; Sibalija et al., 2020). Our results also show that more support was available from friends, and especially from family, for caregivers than for non-caregivers. This is in line with increasing family cohesion that was found during the pandemic (e.g., Horn & Schweppe, 2020). The majority of adult child caregivers in this study were still employed and thus were more at risk from the increased occurrence of role conflicts during the pandemic (Rothgang & Wolf-Ostermann, 2020; Zwar et al., 2021). Higher needs for support could result from this compared to what was experienced by non-caregivers (or spousal caregivers).

Thus, our results may indicate that the adult child caregivers' support networks reacted in line with their support needs. The extent of perceptions of pandemic restrictions among adult child caregivers was on average similar to that of non-caregivers, but higher than was found among spousal caregivers. Still, the support level for adult child caregivers was not dependent on the perception of pandemic restrictions. On the one hand, this may be because stronger perceptions of pandemic restrictions did not affect caregiving or increase their support needs. On the other hand, this may also point to intrapsychic explanations. That is, adult child caregivers may have been better at identifying their support needs (Tatangelo et al., 2018) and had a larger proficiency in acquiring or asking for support (Broese van Groenou et al., 2013; Oldenkamp et al., 2016; Rigby et al., 2019) irrespective of their perception of pandemic restrictions.

In a second set of analyses we focused solely on comparisons between the two informal caregiving groups – adult children and spouses. Differences in social support between adult child and spousal caregivers may be the result of differences in the caregiving situation. In line with previous research (Broese van Groenou et al., 2013; Pinquart & Sorensen, 2011) and as our descriptive results confirm, spousal caregivers provide more caregiving hours, more care tasks and used more formal support (although previous findings regarding formal support use are mixed). Therefore, we included these variables when comparing the informal caregiver groups. The results confirmed what the first set of analyses and the descriptive results already indicated, namely, adult child caregivers received higher levels of support than spousal caregivers, and this was mainly due to higher support by friends. No significant differences in family support were found. This is also in line with pre-pandemic findings focused on comparing both groups of caregivers (Oldenkamp et al., 2016; Pinquart & Sorensen, 2011; Rigby et al., 2019). As elaborated above, different intrapsychic explanations are assumed to be the basis of this difference (Broese van Groenou et al., 2013; Oldenkamp et al., 2016; Rigby et al., 2019; Tatangelo et al., 2018).

However, when perceiving restrictions of the pandemic more strongly, this difference between spousal and adult child caregivers diminished and spousal and adult child caregivers had similar levels of support. This was mainly due to higher levels of support by friends among those spousal caregivers who reported higher levels of perceived restrictions. Level of support by family did not change significantly. As already indicated by the first analyses, but made more explicit by the within group comparison, the level of social support among spousal caregivers with low levels of perceived pandemic restrictions is below the critical cut-off point for social support (Lubben et al., 2006) - primarily due to low levels of support by friends. This raises the question of whether spousal caregivers with weaker perceptions of pandemic restrictions really had lower support needs, or whether this was the result of social restrictions and fear of infection among their wider support network. Moreover, the question arises of whether this level of support is similar to pre-pandemic levels. The pre-pandemic findings for spousal caregivers indicated that is likely (Oldenkamp et al., 2016; Pinquart & Sorensen, 2011; Rigby et al., 2019).

Finally, gender was a significant moderator when comparing social support by friends between the different informal caregiver groups and non-caregivers. Among adult child

caregivers, only men reported more support than non-caregivers. This adds to previous research indicating that women have larger networks than men (Antonucci et al., 2014; Fuhrer & Stansfeld, 2002; Liao et al., 2018), and, as our results indicate, their network support does not seem to depend on their caregiving status. In contrast, men are offered and ask for more support if they provide care, which means their social network seems to change with their need or the need others perceive them to have (del Rio-Lozano et al., 2013; Eriksson et al., 2013; Zygouri et al., 2021). Our findings may reflect this by showing that men who provided care for their parents reported more support than non-caregiving men did.

Among spouses, no difference was found between husbands. However, caregiving wives had significantly less social support than non-caregiving wives. Gender roles are still highly prevalent in the caregiving context and in particular older caregiving wives report difficulties with challenging those (Zygouri et al., 2021). Women also usually invest more time and effort into their networks than men (Tamres et al., 2002; Taylor, 2011) and this may not be possible anymore as a caregiver. Thus, while caregiving husbands may not ask or be offered more support, caregiving wives may actually lose support. Since spousal caregivers are generally less inclined to ask for support (Broese van Groenou et al., 2013; Tatangelo et al., 2018) this may contribute to our finding of the lowest support level among female spousal caregivers.

Benefits and limitations

This study has a few limitations. It is a cross-sectional study which limits causal analysis. Our sample of spousal caregivers was on average 68 years. This is likely the result of our online assessment which may have precluded in particular spousal caregivers of higher age (>80 years) to participate. Thus, the findings of low social support among spousal caregivers may be different, possibly even worse, when taking these spousal caregivers into account. Further research is needed which focuses on recruiting caregivers aged 80 years and older to analyze their social support level and needs. Still, our sample was recruited offline which is expected to have reduced the online bias significantly and the survey included well-established, reliable and validated instruments. In addition, most caregivers in our sample provided multiple care tasks. The sample size of spousal caregivers did not allow for further subgroup analyses per care task type. Further research is therefore recommended to test for possible differences in caregivers performing different care tasks. In the main analyses, we controlled for the number of care tasks to test if differences in social support may be the result of the care intensity, which was found not to be the case. Moreover, the study allowed a closer look at the two main groups of informal caregivers during the COVID-19 pandemic, thereby providing new findings and extending our current knowledge on their perception of social support during this very strenuous time. Also, we could control for various characteristics of the caregiver and, due to our second set of analysis, the caregiving situation.

Conclusion

This study's findings add to our understanding of the social support dynamics among the vulnerable group of informal caregivers for older adults during the COVID-19 pandemic. The findings show that adult child caregivers seem to have a helpful network of family and friends who provided support during the pandemic, which was higher than support levels among non-caregivers or spousal caregivers. This may mirror their higher needs due to the multiple roles they fulfill (e.g., employee, partner, parent, caregiver), but may also be indicative of them being able to request and receive support from their network (Oldenkamp et al., 2016; Rigby et al., 2019). Additional analyses revealed that men in particular seem to have more support if they provided care for their parents, compared to non-caregivers. In contrast, spousal caregivers seemed to lack this level of support, in particular from friends. Spousal caregivers are usually the group with the highest level of burden and poorer mental health when compared to adult child caregivers (Oldenkamp et al., 2016; Pinquart & Sorensen, 2011; Rigby et al., 2019). Especially female spousal caregivers report higher burden (Oldenkamp et al., 2016), and in this study they had the lowest level of support, which was significantly less than among non-caregiving spouses. Furthermore, our findings indicate that spousal caregivers with the weakest perceptions of pandemic restrictions had the lowest level of support. This was below the threshold indicating a socially at-risk population (Lubben et al., 2006). Only with stronger perceptions of pandemic restrictions did this group report similar levels of support as adult child caregivers.

Thus, our findings indicate that actions to help caregivers, in particular during a crisis such as the COVID-19 pandemic, should focus primarily on spousal caregivers, especially female spousal caregivers and their friends network. It is necessary to raise awareness of the caregiving work performed by spouses, which may not only be the most invisible care work, but also the group of caregivers that asks for support only in the direst circumstances. This is especially problematic among female spousal caregivers who may lose network support if they cannot invest as much effort into their social networks as non-caregivers (Tamres et al., 2002; Taylor, 2011), and do not ask for support, instead stoically fulfilling their role as the presumed natural caregiver (Bertogg & Strauss, 2020; Brown & Chen, 2008; Zygouri et al., 2021). These actions should thus focus on assessing (female) spousal caregivers need and offer support to them. In particular, support from a wider social network should be fostered among spousal caregivers. Including volunteer workers, or using psychological interventions aimed at increasing their ability to recognize and accept their own needs and expanding their support-seeking strategies, are possible options. Providing more insight into care work and its difficulties may also help existing networks of caregivers to understand changes in caregiver's behavior in regard to their social network – such as having less resources to invest into the network.

Our findings also indicate that social networks may be rallied in emergency situations if perceived restrictions are particularly high. Considering the difficulties of informal caregiving under regular circumstances (Bom et al., 2019; Zwar et al., 2018), this could be an opportunity to learn how to ask and include the caregivers' (wider) social support network more. It may also improve the readiness to ask for more support under regular circumstances. Further research in this regard is recommended to inform future interventions to ensure adequate support networks for all informal caregivers.

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Author's contributions

LZ contributed to conception, design, and analysis of the data and drafted the manuscript. HHK and AH contributed to review and editing and revised the manuscript critically for important intellectual content. All authors have read and approved the final manuscript.

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References

- Anderson, S., Parmar, J., Dobbs, B., & Tian, P. G. J. (2021). A Tale of Two Solitudes: Loneliness and Anxiety of Family Caregivers Caring in Community Homes and Congregate Care. *Int J Environ Res Public Health*, *18*(19).
<https://doi.org/10.3390/ijerph181910010>
- Antonucci, T. C., Ajrouch, K. J., & Birditt, K. S. (2014). The convoy model: explaining social relations from a multidisciplinary perspective. *Gerontologist*, *54*(1), 82-92.
<https://doi.org/10.1093/geront/gnt118>
- Archer, J., Reiboldt, W., Claver, M., & Fay, J. (2021). Caregiving in Quarantine: Evaluating the Impact of the Covid-19 Pandemic on Adult Child Informal Caregivers of a Parent. *Gerontol Geriatr Med*, *7*, 2333721421990150.
<https://doi.org/10.1177/2333721421990150>
- Beach, S. R., Schulz, R., Donovan, H., & Rosland, A. M. (2021). Family Caregiving During the COVID-19 Pandemic. *Gerontologist*, *61*(5), 650-660.
<https://doi.org/10.1093/geront/gnab049>
- Benke, C., Autenrieth, L. K., Asselmann, E., & Pane-Farre, C. A. (2020). Lockdown, quarantine measures, and social distancing: Associations with depression, anxiety and distress at the beginning of the COVID-19 pandemic among adults from Germany. *Psychiatry Res*, *293*, 113462. <https://doi.org/10.1016/j.psychres.2020.113462>
- Bergmann, M., & Wagner, M. (2021). The Impact of COVID-19 on Informal Caregiving and Care Receiving Across Europe During the First Phase of the Pandemic. *Front Public Health*, *9*, 673874. <https://doi.org/10.3389/fpubh.2021.673874>
- Bertogg, A., & Strauss, S. (2020). Spousal care-giving arrangements in Europe. The role of gender, socio-economic status and the welfare state. *Ageing and Society*, *40*(4), 735-758. <https://doi.org/10.1017/s0144686x18001320>

- Bom, J., Bakx, P., Schut, F., & van Doorslaer, E. (2019). The Impact of Informal Caregiving for Older Adults on the Health of Various Types of Caregivers: A Systematic Review. *Gerontologist*, 59(5), e629-e642. <https://doi.org/10.1093/geront/gny137>
- Broese van Groenou, M. I., de Boer, A., & Iedema, J. (2013). Positive and negative evaluation of caregiving among three different types of informal care relationships. *Eur J Ageing*, 10(4), 301-311. <https://doi.org/10.1007/s10433-013-0276-6>
- Brown, J., & Chen, S. L. (2008). Help-seeking patterns of older spousal caregivers of older adults with dementia. *Issues Ment Health Nurs*, 29(8), 839-852. <https://doi.org/10.1080/01612840802182854>
- Budnick, A., Hering, C., Eggert, S., Teubner, C., Suhr, R., Kuhlmeier, A., & Gellert, P. (2021). Informal caregivers during the COVID-19 pandemic perceive additional burden: findings from an ad-hoc survey in Germany. *BMC Health Serv Res*, 21(1), 353. <https://doi.org/10.1186/s12913-021-06359-7>
- Bundesministerium der Justiz. (2021). *Personenstandsgesetz*. Retrieved from <https://www.gesetze-im-internet.de/pstg/BJNR012210007.html#BJNR012210007BJNG000900000>
- Bundesregierung, D. (2020). *Telefonkonferenz der Bundeskanzlerin mit den Regierungschefinnen und Regierungschefs der Länder am 13. Dezember 2020*. Retrieved from <https://www.bundesregierung.de/resource/blob/975226/1827366/69441fb68435a7199b3d3a89bff2c0e6/2020-12-13-beschluss-mpk-data.pdf?download=1>
- Bundesregierung, D. (2021). *Videoschaltkonferenz der Bundeskanzlerin mit den Regierungschefinnen und Regierungschefs der Länder am 3. März 2021*. Retrieved from <https://www.bundesregierung.de/breg-de/suche/videoschaltkonferenz-der->

bundeskanzlerin-mit-den-regierungschefinnen-und-regierungschefs-der-laender-am-3-
maerz-2021-1872288

- Cohen, S. (2004). Social relationships and health. *Am Psychol*, 59(8), 676-684.
<https://doi.org/10.1037/0003-066X.59.8.676>
- Cohen, S., & McKay, G. (1984). Social support, stress, and the buffering hypothesis: A theoretical analysis. *Baum Andrew, Taylor Shelley E, Singer Jerome E., editors. Handbook of Psychology and Health. Hillsdale, NJ: Erlbaum, 253-267.*
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychol Bull*, 98(2), 310-357. <https://www.ncbi.nlm.nih.gov/pubmed/3901065>
- Del-Pino-Casado, R., Priego-Cubero, E., Lopez-Martinez, C., & Orgeta, V. (2021). Subjective caregiver burden and anxiety in informal caregivers: A systematic review and meta-analysis. *PLoS One*, 16(3), e0247143.
<https://doi.org/10.1371/journal.pone.0247143>
- del Rio-Lozano, M., Garcia-Calvente Mdel, M., Marcos-Marcos, J., Entrena-Duran, F., & Maroto-Navarro, G. (2013). Gender identity in informal care: impact on health in Spanish caregivers. *Qual Health Res*, 23(11), 1506-1520.
<https://doi.org/10.1177/1049732313507144>
- Ekwall, A. K., Sivberg, B., & Hallberg, I. R. (2005). Loneliness as a predictor of quality of life among older caregivers. *J Adv Nurs*, 49(1), 23-32. <https://doi.org/10.1111/j.1365-2648.2004.03260.x>
- Eriksson, H., Sandberg, J., & Hellstrom, I. (2013). Experiences of long-term home care as an informal caregiver to a spouse: gendered meanings in everyday life for female carers. *Int J Older People Nurs*, 8(2), 159-165. <https://doi.org/10.1111/j.1748-3743.2012.00340.x>

Eurocarers/IRCCS-INRCA. (2021). *Impact of the COVID-19 outbreak on informal carers across Europe - Final report.*

Fuhrer, R., & Stansfeld, S. A. (2002). How gender affects patterns of social relations and their impact on health: a comparison of one or multiple sources of support from "close persons". *Soc Sci Med*, 54(5), 811-825. [https://doi.org/10.1016/s0277-9536\(01\)00111-3](https://doi.org/10.1016/s0277-9536(01)00111-3)

Giebel, C., Cannon, J., Hanna, K., Butchard, S., Eley, R., Gaughan, A., Komuravelli, A., Shenton, J., Callaghan, S., Tetlow, H., Limbert, S., Whittington, R., Rogers, C., Rajagopal, M., Ward, K., Shaw, L., Corcoran, R., Bennett, K., & Gabbay, M. (2021). Impact of COVID-19 related social support service closures on people with dementia and unpaid carers: a qualitative study. *Aging Ment Health*, 25(7), 1281-1288. <https://doi.org/10.1080/13607863.2020.1822292>

Horn, V., & Schweppe, C. (2020). Häusliche Altenpflege in Zeiten von Corona.

Jackson, P. B. (1992). Specifying the Buffering Hypothesis - Support, Strain, and Depression. *Social Psychology Quarterly*, 55(4), 363-378. <https://doi.org/Doi 10.2307/2786953>

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer publishing company.

Liao, J., McMunn, A., Mejias, S. T., & Brunner, E. J. (2018). Gendered trajectories of support from close relationships from middle to late life. *Ageing & Society*, 38(4), 746-765. <https://doi.org/10.1017/S0144686x16001264>

Lightfoot, E., Yun, H., Moone, R., Otis, J., Suleiman, K., Turck, K., & Kutzler, C. (2021). Changes to Family Caregiving of Older Adults and Adults with Disabilities during COVID-19. *Gerontol Geriatr Med*, 7, 23337214211002404. <https://doi.org/10.1177/23337214211002404>

Lorenz-Dant, K. (2020). *Germany and the COVID-19 long-term care situation.*

- Lubben, J., Blozik, E., Gillmann, G., Iliffe, S., von Renteln Kruse, W., Beck, J. C., & Stuck, A. E. (2006). Performance of an abbreviated version of the Lubben Social Network Scale among three European community-dwelling older adult populations. *Gerontologist, 46*(4), 503-513. <https://doi.org/10.1093/geront/46.4.503>
- National Alliance for Caregiving, & AARP Public Policy Institute. (2020). *Caregiving in the U.S.: 2020 Report*.
- Nguyen, A. W., Chatters, L. M., Taylor, R. J., & Mouzon, D. M. (2016). Social Support from Family and Friends and Subjective Well-Being of Older African Americans. *Journal of happiness studies, 17*(3), 959-979. <https://doi.org/10.1007/s10902-015-9626-8>
- Oldenkamp, M., Hagedoorn, M., Slaets, J., Stolk, R., Wittek, R., & Smidt, N. (2016). Subjective burden among spousal and adult-child informal caregivers of older adults: results from a longitudinal cohort study. *BMC Geriatr, 16*(1), 208. <https://doi.org/10.1186/s12877-016-0387-y>
- Pearlin, L. I., Mullan, J. T., Semple, S. J., & Skaff, M. M. (1990). Caregiving and the stress process: an overview of concepts and their measures. *Gerontologist, 30*(5), 583-594. <https://doi.org/10.1093/geront/30.5.583>
- Pinquart, M., & Sorensen, S. (2011). Spouses, adult children, and children-in-law as caregivers of older adults: a meta-analytic comparison. *Psychol Aging, 26*(1), 1-14. <https://doi.org/10.1037/a0021863>
- Rigby, T., Ashwill, R. T., Johnson, D. K., & Galvin, J. E. (2019). Differences in the Experience of Caregiving Between Spouse and Adult Child Caregivers in Dementia With Lewy Bodies. *Innov Aging, 3*(3), igz027. <https://doi.org/10.1093/geroni/igz027>
- Rokstad, A. M. M., Rosvik, J., Fossberg, M., & Eriksen, S. (2021). The COVID-19 pandemic as experienced by the spouses of home-dwelling people with dementia - a qualitative study. *BMC Geriatr, 21*(1), 583. <https://doi.org/10.1186/s12877-021-02551-w>

- Roth, A. R. (2020). Informal Caregiving and Network Turnover Among Older Adults. *J Gerontol B Psychol Sci Soc Sci*, 75(7), 1538-1547.
<https://doi.org/10.1093/geronb/gby139>
- Rothgang, H., & Müller, R. (2018). *Pflegereport 2018: Schriftenreihe zur Gesundheitsanalyse*.
- Rothgang, H., & Wolf-Ostermann, K. (2020). *Zur Situation der häuslichen Pflege in Deutschland während der Corona-Pandemie. Ergebnisse einer Online- Befragung von informellen Pflegepersonen im erwerbsfähigen Alter*.
- Shirai, Y., Silverberg Koerner, S., & Baete Kenyon, D. (2009). Reaping caregiver feelings of gain: the roles of socio-emotional support and mastery. *Aging Ment Health*, 13(1), 106-117. <https://doi.org/10.1080/13607860802591054>
- Sibalija, J., Savundranayagam, M. Y., Orange, J. B., & Kloseck, M. (2020). Social support, social participation, & depression among caregivers and non-caregivers in Canada: a population health perspective. *Aging Ment Health*, 24(5), 765-773.
<https://doi.org/10.1080/13607863.2018.1544223>
- Tamres, L. K., Janicki, D., & Helgeson, V. S. (2002). Sex differences in coping behavior: A meta-analytic review and an examination of relative coping. *Personality and Social Psychology Review*, 6(1), 2-30. https://doi.org/Doi 10.1207/S15327957pspr0601_1
- Tatangelo, G., McCabe, M., Macleod, A., & You, E. (2018). "I just don't focus on my needs." The unmet health needs of partner and offspring caregivers of people with dementia: A qualitative study. *Int J Nurs Stud*, 77, 8-14.
<https://doi.org/10.1016/j.ijnurstu.2017.09.011>
- Taylor, S. E. (2011). Social support: A review. In *The Oxford handbook of health psychology*. (pp. 189-214). Oxford University Press.

- van Roij, J., Brom, L., Youssef-El Soud, M., van de Poll-Franse, L., & Raijmakers, N. J. (2019). Social consequences of advanced cancer in patients and their informal caregivers: a qualitative study. *Supportive Care in Cancer*, 27(4), 1187-1195.
- Verbakel, E., Metzelthin, S. F., & Kempen, G. (2018). Caregiving to Older Adults: Determinants of Informal Caregivers' Subjective Well-being and Formal and Informal Support as Alleviating Conditions. *J Gerontol B Psychol Sci Soc Sci*, 73(6), 1099-1111. <https://doi.org/10.1093/geronb/gbw047>
- Verbakel, E., Tamlagsronning, S., Winstone, L., Fjaer, E. L., & Eikemo, T. A. (2017). Informal care in Europe: findings from the European Social Survey (2014) special module on the social determinants of health. *Eur J Public Health*, 27(suppl_1), 90-95. <https://doi.org/10.1093/eurpub/ckw229>
- WHO. (2021). *WHO COVID-19 Dashboard Germany*. World Health Organization. Retrieved 19.01.2022 from <https://covid19.who.int/info/>
- Yu, D. S. F., Cheng, S. T., & Wang, J. (2018). Unravelling positive aspects of caregiving in dementia: An integrative review of research literature. *Int J Nurs Stud*, 79, 1-26. <https://doi.org/10.1016/j.ijnurstu.2017.10.008>
- Zhou, F., Yu, T., Du, R., Fan, G., Liu, Y., Liu, Z., Xiang, J., Wang, Y., Song, B., Gu, X., Guan, L., Wei, Y., Li, H., Wu, X., Xu, J., Tu, S., Zhang, Y., Chen, H., & Cao, B. (2020). Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *Lancet*, 395(10229), 1054-1062. [https://doi.org/10.1016/S0140-6736\(20\)30566-3](https://doi.org/10.1016/S0140-6736(20)30566-3)
- Zwar, L., Konig, H. H., & Hajek, A. (2018). Consequences of different types of informal caregiving for mental, self-rated, and physical health: longitudinal findings from the German Ageing Survey. *Qual Life Res*, 27(10), 2667-2679. <https://doi.org/10.1007/s11136-018-1926-0>

Zwar, L., König, H. H., & Hajek, A. (2021). Informal caregiving during the COVID-19 pandemic: findings from a representative, population-based study during the second wave of the pandemic in Germany. *Aging Ment Health*, 1-9.

<https://doi.org/10.1080/13607863.2021.1989377>

Zygouri, I., Cowdell, F., Ploumis, A., Gouva, M., & Mantzoukas, S. (2021). Gendered experiences of providing informal care for older people: a systematic review and thematic synthesis. *BMC Health Serv Res*, 21(1), 730. <https://doi.org/10.1186/s12913-021-06736-2>

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Tables

Table 1

Descriptive statistics for the basic samples of *non-caregivers*, adult children providing care for their parents(-in-law) (*adult child caregivers*) and spouses providing care for their partner (*spousal caregivers*)

	M(SD) / N(%)		
	Non-caregivers (N=2520)	Adult child caregivers (N=337)	Spousal caregivers (N=55)
Social support (general)	14.74 (\pm 5.13)	16.00 (\pm 4.79)	13.12 (\pm 5.21)
Social support from family	8.07 (\pm 3.03)	8.87 (\pm 2.77)	8.18 (\pm 2.76)
Social support from friends	6.67 (\pm 3.25)	7.10 (\pm 3.12)	5.10 (\pm 3.14)
Perception of pandemic restrictions	2.94 (\pm 1.07)	2.99 (\pm 1.05)	2.67 (\pm .98)
Age	58.48 (\pm 10.55)	55.98 (\pm 7.72)	68.25 (\pm 10.36)
Gender (%)			
- male	1,286 (51.07)	134 (39.76)	17 (30.91)
- female	1,232 (48.93)	203 (60.24)	38 (69.09)
- diverse ^a	2 (0.08)	-	-
Education (%)			
- without school leaving certificate	4 (0.16)	-	-
- lower secondary school	598 (23.73)	54 (16.02)	15 (27.27)
- intermediate secondary school	790 (31.35)	126 (37.39)	20 (36.36)
- polytechnic secondary school	184 (7.30)	30 (8.90)	5 (9.09)
- qualification for applied upper secondary school	217 (8.61)	37 (10.98)	4 (7.27)
- upper secondary school	714 (28.33)	88 (26.11)	10 (18.18)

Marital status (%)

- married/in relationship	a	1,717 (68.13)	233 (69.14)	51 (92.73)
- divorced		298 (11.83)	44 (13.06)	-
- widowed		160 (6.35)	10 (2.97)	3 (5.45)
- single		335 (13.29)	49 (14.55)	-

Employment status (%)

- employed (fulltime)		1,165 (46.23)	155 (45.99)	8 (14.55)
- employed (part-time)		368 (14.60)	74 (21.96)	7 (12.73)
- marginally employed		50 (1.98)	12 (3.56)	1 (1.82)
- retired		800 (31.75)	61 (18.10)	35 (63.64)
- unemployed		134 (5.32)	34 (10.09)	3 (5.45)

Self-rated health 3.57 (\pm .88) 3.46 (\pm .88) 3.22 (\pm .94)

Use of formal care services (Yes) (%) - 202 (59.94) 24 (43.64)

Caregiving time (hours per week) - 9.78 (\pm 10.52) 36.35 (\pm 41.29)

Number of care tasks - 3.75 (\pm 1.75) 4.96 (\pm 2.02)

Note. Frequency and percentage (N(%)) are given for categorical variables, mean and standard deviation are given for continuous variables (M(SD)). Social support (LSNS-6): general score refers to social support provided by friends and family (Range: 0-30) and can be split into two subscales: social support by family and social support provided by friends (Range: 0-15), higher scores indicate higher social support; perceptions of pandemic restrictions (Range: 1-5, higher scores indicate higher impairment); self-rated health (Range: 1-5, higher scores indicate better health); use of formal care services (yes/no, use of ambulatory care services, paid household help, meals on wheels, shopping help, privately employed caregiver, day or nighttime care, short-term care, prevention care, other forms of care), caregiving time (hours per week), number of care tasks (Range: 1-10, including help with personal hygiene, dressing, feeding, household, supervision, transportation, medication intake, support by caregivers with financial matters, financial support, other support).

^aThe gender category diverse refers to persons who cannot be categorized into the male or female gender due to a variation in their sex development (Bundesministerium der Justiz, 2021)

Table 2

Results of adjusted regression analyses are given for the outcomes *social support in general (model 1, 2, 3)*, *by family (model 4, 5, 6)* and *by friends (models 7, 8, 9, 10, 11)* when comparing *non-caregivers* (reference group) to *informal caregivers* in terms of adult children providing care for their parents(in-law) (*adult child caregivers*) and spouses providing care for their partner (*spousal caregivers*)

	Social support (general)			Social support (family)			Social support (friends)				
	(1)	Moderator analysis (perception of pandemic restrictions) (2)	Moderator analysis (gender) (3)	(4)	Moderator analysis (perception of pandemic restrictions) (5)	Moderator analysis (gender) (6)	(7)	Moderator analysis (perception of pandemic restrictions) (8)	Moderator analysis (gender) (9)	Stratified analysis (10)	(11)
										Men	Women
<i>Main predictors</i>											
Adult child caregivers (ref. non-caregivers)	1.31*** (0.28)	0.95 (0.80)	1.69*** (0.43)	0.86*** (0.16)	0.48 (0.51)	0.94*** (0.24)	0.42* (0.18)	0.44 (0.51)	0.70* (0.29)	0.71* (0.28)	0.22 (0.24)
Spousal caregivers (ref. non-caregivers)	-1.90* (0.75)	-6.91*** (1.78)	-0.56 (1.11)	-0.30 (0.37)	-2.39** (0.93)	-0.54 (0.55)	-1.53** (0.47)	-4.47*** (0.99)	0.00 (0.76)	0.00 (0.75)	- 2.20*** (0.56)
<i>Moderator</i>											
Perceptions of pandemic restrictions	-	0.05 (0.10)	-	-	-0.02 (0.06)	-	-	0.08 (0.06)	-	-	-
Adult child caregivers (ref. non-caregivers)	-	0.12	-	-	0.13	-	-	-0.00	-	-	-

non-caregivers) x perceptions of pandemic restrictions		(0.26)			(0.16)			(0.17)			
Spousal caregivers (ref. non-caregivers) x perceptions of pandemic restrictions	-	1.93**	-	-	0.80*	-	-	1.14**			
		(0.68)			(0.37)			(0.37)			
Gender (ref. male)										-	-
- female	0.63**	0.62**	0.73***	0.29*	0.28*	0.30*	0.34**	0.34*	0.43**	-	-
	(0.20)	(0.21)	(0.22)	(0.12)	(0.12)	(0.13)	(0.13)	(0.13)	(.14)		
- diverse	-4.45	-4.47	-4.38	-2.07	-2.06	-2.06	-2.41	-2.44	-2.34	-	-
	(4.45)	(4.41)	(4.45)	(2.10)	(2.12)	(2.10)	(2.35)	(2.27)	(2.34)		
Adult child caregivers (ref. non- caregivers) x gender – female (ref. male)	-	-	-0.66	-	-	-0.13	-	-	-0.48	-	-
			(0.56)			(0.32)			(0.37)		
Adult child caregivers (ref. non- caregivers) x gender – diverse (ref. male) ^a	-	-	0	-	-	0	-	-	0	-	-
Spousal caregivers (ref.	-	-	-1.98	-	-	0.35	-	-	-2.25*	-	-

non- caregivers)			(1.45)			(0.72)			(0.93)		
x gender - female (ref. male)											
Spousal caregivers (ref. non- caregivers) x gender – diverse (ref. male) ^a	-	-	0	-	-	0	-	-	0	-	-
<i>Covariates</i>											
Age	0.02 (0.01)	0.01 (0.01)	0.02 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.00 (0.01)
Education (ref. upper secondary school)											
- Without school leaving certificate	1.41 (1.91)	1.43 (1.91)	1.39 (1.93)	1.32 (0.97)	1.31 (0.97)	1.31 (0.97)	0.09 (1.42)	0.12 (1.43)	0.07 (1.44)	5.00*** (0.19)	- 1.67*** (0.26)
- lower secondary school	-1.87*** (0.27)	-1.90*** (0.27)	-1.86*** (0.27)	- 0.73*** (0.16)	-0.74*** (0.16)	-0.73*** (0.16)	- 1.15*** (0.18)	-1.17*** (0.18)	-1.15*** (0.18)	-0.77** (0.24)	- 1.53*** (0.26)
- intermediate secondary school	-0.85*** (0.24)	-0.86*** (0.24)	-0.85*** (0.24)	-0.39** (0.14)	-0.39** (0.14)	-0.40** (0.14)	-0.45** (0.15)	-0.45** (0.15)	-0.44** (0.15)	-0.67** (0.23)	-0.29 (0.21)
- polytechnic secondary	-1.36*** (0.36)	-1.32*** (0.36)	-1.34*** (0.36)	-0.57** (0.21)	-0.58** (0.21)	-0.57** (0.21)	-0.78** (0.24)	-0.75** (0.24)	-0.76** (0.24)	-0.45 (0.33)	- 1.23***

	school											(0.36)
-	qualification for applied upper secondary school	0.05 (0.36)	0.06 (0.36)	0.08 (0.35)	-0.16 (0.21)	-0.15 (0.21)	-0.15 (0.21)	0.19 (0.23)	0.18 (0.23)	0.21 (0.22)	0.09 (0.30)	0.38 (0.34)
Marital status (ref. married)												
-	divorced	-1.73*** (0.29)	-1.71*** (0.30)	-1.75*** (0.30)	- 1.20*** (0.19)	-1.19*** (0.19)	-1.20*** (0.19)	-0.57** (0.19)	-0.56** (0.19)	-0.59** (0.19)	-0.49 (0.31)	-0.56* (0.24)
-	widowed	-0.30 (0.42)	-0.27 (0.42)	-0.32 (0.42)	-0.78** (0.25)	-0.77** (0.25)	-0.78** (0.25)	0.41 (0.27)	0.42 (0.27)	0.39 (0.27)	-0.15 (0.60)	0.59+ (0.31)
-	single	-1.83*** (0.28)	-1.82*** (0.28)	-1.85*** (0.28)	- 1.91*** (0.17)	-1.89*** (0.17)	-1.91*** (0.17)	0.09 (0.18)	0.11 (0.18)	0.08 (0.18)	-0.31 (0.27)	0.39 (0.25)
Employment status (ref. employed (fulltime))												
-	employed (parttime)	0.44 (0.29)	0.39 (0.29)	0.43 (0.29)	0.03 (0.17)	0.02 (0.17)	0.04 (0.17)	0.40* (0.18)	0.37* (0.18)	0.39* (0.18)	0.70+ (0.38)	0.41+ (0.22)
-	marginally employed	-0.28 (0.63)	-0.26 (0.63)	-0.26 (0.63)	-0.21 (0.37)	-0.20 (0.37)	-0.21 (0.37)	-0.07 (0.42)	-0.06 (0.42)	-0.06 (0.42)	1.35+ (0.77)	-0.28 (0.49)
-	retired	0.13 (0.33)	0.15 (0.33)	0.11 (0.33)	0.03 (0.20)	0.04 (0.20)	0.04 (0.20)	0.13 (0.21)	0.15 (0.21)	0.12 (0.21)	-0.02 (0.29)	0.39 (0.30)
-	unemployed	-0.29	-0.25	-0.29	-0.32	-0.29	-0.32	0.05	0.06	0.05	-0.12	0.21

	(0.41)	(0.41)	(0.41)	(0.24)	(0.24)	(0.24)	(0.26)	(0.27)	(0.26)	(0.36)	(0.38)
Self-rated health	0.94***	0.97***	0.94***	0.41***	0.41***	0.41***	0.52***	0.54***	0.52***	0.45***	0.58***
	(0.11)	(0.11)	(0.11)	(0.06)	(0.06)	(0.06)	(0.07)	(0.07)	(0.07)	(0.10)	(0.10)
Constant	11.35***	11.15***	11.32***	6.79***	6.90***	6.79***	4.65***	4.30***	4.62***	4.67***	4.87***
	(0.87)	(0.95)	(0.88)	(0.51)	(0.56)	(0.51)	(0.54)	(0.59)	(0.54)	(0.81)	(0.72)
Observations	2,789	2,778	2,789	2,840	2,826	2,840	2,818	2,806	2,818	1,394	1,422
R ²	0.09	0.09	0.09	0.09	0.09	0.09	0.06	0.06	0.06	0.04	0.09

Note. Unstandardized regression coefficients are given with robust standard errors in parentheses. Social support (LSNS-6): general score refers to social support provided by friends and family (Range: 0-30) and can be split into two subscales: social support by family and social support provided by friends (Range: 0-15), higher scores indicate higher social support; perception of pandemic restrictions (Range: 1-5, higher scores indicate higher impairment); self-rated health (Range: 1-5, higher scores indicate better health). Level of significance: *** p<0.001, ** p<0.01, * p<0.05, + p<0.10.

^aNo interaction effect was calculated for the category diverse, because the sample size of this subsample was too small.

Table 3

Results of adjusted regression analyses are given for the outcomes *social support in general* (models 1, 2, 3), *by family* (models 4, 5, 6) and *by friends* (models 7, 8, 9) when comparing adult children providing care for their parents(in-law) (*adult child caregivers*) and spouses providing care for their partner (*spousal caregivers*) with each other

	Social support (general)			Social support (family)			Social support (friends)		
	(1)	Moderator analysis (perceptions of pandemic restrictions) (2)	Moderator analysis (gender) (3)	(4)	Moderator analysis (perceptions of pandemic restrictions) (5)	Moderator analysis (gender) (6)	(7)	Moderator analysis (perceptions of pandemic restrictions) (8)	Moderator analysis (gender) (9)
<i>Main predictors</i>									
Spousal caregivers (ref. adult child caregivers)	-2.58* (1.10)	-7.21** (2.28)	-1.56 (1.41)	-0.59 (0.59)	-2.31+ (1.25)	-0.67 (0.72)	-1.87** (0.65)	-4.91*** (1.35)	-0.86 (0.95)
<i>Moderator</i>									
perceptions of pandemic restrictions	-	0.13 (0.25)	-	-	0.09 (0.16)	-	-	0.05 (0.18)	-
Spousal caregivers (ref. adult child caregivers) x perceptions of pandemic restrictions	-	1.75* (0.82)	-	-	0.65 (0.44)	-	-	1.14* (0.46)	-
Gender (ref. male) ^a	-0.23 (0.58)	-0.27 (0.58)	-0.05 (0.62)	0.31 (0.33)	0.26 (0.33)	0.30 (0.36)	-0.49 (0.37)	-0.49 (0.37)	-0.31 (0.39)

Spousal caregivers (ref. adult child caregivers) x gender (ref. male)	-	-	-1.53 (1.73)	-	-	0.12 (0.84)			-1.52 (1.14)
<i>Covariates</i>									
Caregiving time	-0.00 (0.02)	0.00 (0.02)	-0.00 (0.02)	-0.00 (0.01)	0.00 (0.01)	-0.00 (0.01)	-0.00 (0.01)	0.00 (0.01)	-0.00 (0.01)
Number of care tasks	-0.17 (0.17)	-0.13 (0.17)	-0.16 (0.17)	-0.07 (0.10)	-0.06 (0.10)	-0.07 (0.10)	-0.08 (0.11)	-0.06 (0.10)	-0.07 (0.11)
Use of formal care services	0.16 (0.57)	0.04 (0.57)	0.11 (0.57)	0.29 (0.32)	0.22 (0.32)	0.29 (0.32)	-0.09 (0.36)	-0.15 (0.36)	-0.14 (0.36)
Age	0.09 (0.05)	0.08 (0.05)	0.09 (0.05)	0.06+ (0.03)	0.05+ (0.03)	0.06+ (0.03)	0.03 (0.03)	0.02 (0.03)	0.03 (0.03)
Education (ref. upper secondary school)									
- lower secondary school	-0.26 (0.86)	-0.39 (0.88)	-0.26 (0.86)	-0.42 (0.50)	-0.47 (0.50)	-0.42 (0.50)	0.10 (0.59)	0.01 (0.60)	0.10 (0.58)
- intermediate secondary school	0.40 (0.66)	0.37 (0.65)	0.41 (0.65)	-0.25 (0.36)	-0.27 (0.36)	-0.25 (0.36)	0.66 (0.45)	0.66 (0.45)	0.67 (0.45)
- polytechnic secondary school	0.84 (0.94)	0.88 (0.92)	0.91 (0.95)	0.47 (0.55)	0.47 (0.54)	0.46 (0.55)	0.36 (0.61)	0.40 (0.61)	0.43
- qualification for applied upper secondary school	0.93 (0.97)	0.91 (0.96)	0.95 (0.96)	-0.49 (0.54)	-0.48 (0.53)	-0.49 (0.54)	1.42* (0.61)	1.39* (0.61)	1.43* (0.61)
Marital status (ref. married)									

- divorced	-1.39 (0.93)	-1.34 (0.92)	-1.39 (0.93)	-0.30 (0.47)	-0.26 (0.47)	-0.30 (0.47)	-1.10+ (0.64)	-1.08+ (0.63)	-1.09+ (0.64)
- widowed	1.15 (1.50)	1.32 (1.46)	1.06 (1.50)	-0.14 (0.79)	-0.07 (0.79)	-0.14 (0.80)	1.32 (0.96)	1.42 (0.92)	1.23 (0.95)
- single	-1.87* (0.77)	-1.87* (0.78)	-1.88* (0.77)	-1.29** (0.49)	-1.27** (0.49)	-1.29** (0.49)	-0.59 (0.48)	-0.60 (0.48)	-0.59 (0.48)
Employment status (ref. employed (fulltime))									
- employed (parttime)	0.57 (0.74)	0.42 (0.73)	0.52 (0.75)	-0.09 (0.42)	-0.14 (0.41)	-0.09 (0.42)	0.63 (0.47)	0.53 (0.47)	0.58 (0.47)
- marginally employed	-2.19 (1.99)	-2.30 (2.04)	-2.29 (2.01)	-0.69 (1.01)	-0.73 (1.02)	-0.68 (1.01)	-1.52 (1.17)	-1.59 (1.19)	-1.62 (1.18)
- retired	-2.10* (1.00)	-1.99* (0.97)	-2.15* (1.00)	-1.43* (0.58)	-1.42* (0.58)	-1.43* (0.59)	-0.63 (0.57)	-0.54 (0.56)	-0.69 (0.57)
- unemployed	-0.16 (0.99)	-0.17 (1.00)	-0.18 (1.00)	-0.26 (0.54)	-0.25 (0.54)	-0.25 (0.54)	0.02 (0.65)	0.02 (0.66)	0.00 (0.66)
Self-rated health	1.19*** (0.28)	1.22*** (0.28)	1.19*** (0.28)	0.60*** (0.17)	0.62*** (0.17)	0.60*** (0.17)	0.59** (0.18)	0.61*** (0.18)	0.59** (0.18)
Constant	8.22** (3.11)	8.15* (3.18)	8.12** (3.13)	4.31* (1.76)	4.19* (1.80)	4.31* (1.76)	3.82* (1.79)	3.88* (1.88)	3.71* (1.82)
Observations	329	328	329	335	334	335	330	329	330
R ²	0.13	0.15	0.13	0.12	0.13	0.12	0.11	0.13	0.12

Note. Unstandardized regression coefficients are given with robust standard errors in parentheses. Social support (LSNS-6): general score refers to social support provided by friends and family (Range: 0-30) and can be split into two subscales: social support by family and social support provided by friends (Range: 0-15), higher scores indicate higher social support; perception of pandemic restrictions (Range: 1-5, higher scores

indicate higher impairment); self-rated health (Range: 1-5, higher scores indicate better health); use of formal care services (yes/no, use of ambulatory care services, paid household help, meals on wheels, shopping help, privately employed caregiver, day or nighttime care, short-term care, prevention care, other forms of care), caregiving time (hours per week), number of care tasks (Range: 1-10, including help with personal hygiene, dressing, feeding, household, supervision, transportation, medication intake, support by caregivers with financial matters, financial support, other support). Level of significance: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.10$.

^aNo caregiver was part of the gender category diverse, thus, no effect for diverse was calculated.