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Expressive social support buffers the impact of care-related work interruptions on caregivers' depressive symptoms

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Abstract

Objective: To assess if expressive and instrumental social support from family and friends moderate the association of care-related work interruptions (e.g., leaving work for the older adult's doctor appointment) with depressive symptoms among working family caregivers of older adults.

Method: Data were from the Singapore Survey on Informal Caregiving (SSIC). A subsample of 662 dyads, each comprising an older care-recipient (home-dwelling Singaporean aged 75 and older receiving human assistance for at least one activity of daily living (ADL)) and his/her working family caregiver, was analysed. Caregiver depressive symptoms were assessed using the Center for Epidemiologic Studies Depression scale. Care-related work interruptions were scaled through the Mokken scaling procedure. Expressive social support was assessed using a scale by Pearlin and colleagues. Instrumental social support was based on the hours of ADL help provided to the care recipient by any family member or friend, on behalf of the primary caregiver. A linear regression model, with interaction terms, assessed expressive and instrumental social support as moderators of the association of care-related work interruptions with caregiver depressive symptoms.

Results: More care-related work interruptions were associated with more caregiver depressive symptoms. And, this association was moderated by expressive, but not instrumental, social support.

Conclusion: Our findings conform to previous qualitative work suggesting that caregivers' mental health may not benefit from instrumental support, but from receiving expressive support instead. Initiatives for improving the care experience of working caregivers of older adults should focus on promoting expressive support from their friends and family.

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Background

The increasing number of older adults living at home with physical or cognitive impairment has led to a heavier emphasis on informal or family caregiving (Roth, Fredman, & Haley, 2015). While most health care systems rely on informal care or assume that it will be readily available, shrinking family sizes mean that caregiving responsibilities will likely be shared among fewer family members, thereby placing an increased burden on individual family caregivers (Butterworth, Pymont, Rodgers, Windsor, & Anstey, 2010; Mehta, 2006a; Roth et al., 2015; Verbakel, Metzelthin, & Kempen, 2016). Within this context, the mental health of family caregivers requires special attention. While care provision is detrimental to multiple aspects of caregivers' health, the impact is most pronounced on mental health outcomes, such as depression or depressive symptoms (Mehta, 2006b; Pinquart & Sörensen, 2004). At least two implications follow. First, the negative mental health state of caregivers could also affect care-recipients, given reciprocity of depressive symptoms between caregivers and care-recipients (Malhotra et al., 2016). Second, onset of depression in caregivers has been shown to predict discontinued caregiving and care-recipient institutionalization (Arai, Sugiura, Washio, Miura, & Kudo, 2001), resulting in additional strain on the formal long term care (LTC) infrastructure. These considerations suggest that for family caregiving to benefit both the care-recipient and the community, promotion and maintenance of mental health of family caregivers is a priority.

While some studies suggest concomitant work (i.e. employment) and caregiving benefits caregivers by providing a source of satisfaction and personal growth (Hammer, Colton, Caubet, & Brockwood, 2002; Scharlach, 1994), its negative effects seem to outweigh the positive effects overall. Scharlach, Gustavson, and Dal Santo (2007) have highlighted that employed caregivers may have access to more social and personal resources at the workplace, such as information from colleagues or counselling services that can alleviate deleterious aspects of caregiving, thus better equipping them to be caregivers (i.e. role enhancement). However, they also note that working caregivers can be limited by time constraints to access these resources (Scharlach et al., 2007). Working caregivers may also experience concurrent or conflicting work and caregiving demands being made of scarce time and resources, resulting in role strain or conflict at the caregiving-work nexus (Given, Given, Sherwood, & DeVoss, 2013; Gordon, Pruchno, Wilson-Genderson, Murphy, & Rose, 2012). In general, working family caregivers seem more likely to have worse mental health compared to individuals who only work or provide care exclusively (Honda, Date, Abe, Aoyagi, & Honda, 2014; Lee, Walker, & Shoup, 2001; Longacre, Valdmanis, Handorf, & Fang, 2016), especially with regard to depressive symptoms. For example, those engaged both in work and caregiving roles exhibit more depressive symptoms than those involved in only one of those roles (Lee et al., 2001). Similarly, employees caring for older relatives have more depressive symptoms compared to employees who do not (Honda et al., 2014). The same association was not observed among caregivers who were not working. Further, Longacre et al. (2016) also found that working caregivers experience greater emotional stress as the duration of care increases (both in terms of the hours of care provided and the total time spent in the caregiving role), suggesting that the burden of caregiving is cumulative over time for those with work demands.

Several explanations are offered here. Employed caregivers may be more susceptible to worse mental health because negative feelings (such as stress) from one role spreads – or spills over – to the other, resulting in accumulated stress (Sakka et al., 2016; Stephens, Franks, & Atienza, 1997). Negative experiences from care may colour one's perception of work and vice versa. Moreover, caregiving responsibilities may render it harder for one to recover from job demands after work (Geurts, Kompier, Roxburgh, & Houtman, 2003), or to attend to their own personal needs and desires (Utz, Lund, Caserta, & Wright, 2012). The role strain and conflict experienced by working caregivers may also increase the perceived work or caregiving burden/stress from occupying both roles (Gordon et al., 2012).

Caregiving-work conflict has been widely accepted as bidirectional, with caregiving interfering with work (CIW) and work interfering with caregiving (WIC) (Gordon et al., 2012). Even though CIW and WIC have a reciprocal relationship, they are conceptually distinct, with different antecedents and outcomes (Cullen, Hammer, Neal, & Sinclair, 2009; Gordon & Rouse, 2013). This paper contributes to the literature by focusing specifically on care-related work interruptions ($\times$ CIW), which may include having to take time off from work, make telephone calls, or experience reduced productivity due to care provision (Cullen et al., 2009; Scharlach, 1994). These interruptions may then lead to worse mental health outcomes (Kim, Ingersoll-Dayton, & Kwak, 2013; Scharlach, 1994). Caregivers who are constantly interrupted at work may be prevented from using the workplace as a time for respite (Utz et al., 2012), thereby exacerbating the stress they feel from playing both roles. Also, it may also worsen the relationship between caregiver and care recipient, who may feel that they are sacrificing personal rewards and benefits that come from employment and building their career (Given et al., 2013).

Social support is a key protective factor against the detrimental effects of stressors for caregivers' mental health (Chiou, Chang, Chen, & Wang, 2009; Demirtepe-Saygili & Bozo, 2011; Kim & Knight, 2008; Miller et al., 2001; Upton & Reed, 2006). Defined as "social resources that persons perceive to be available or that are actually provided" (Gottlieb & Bergen, 2010, p. 513), social support may be either expressive or instrumental (Pearlin, Mullan, Semple, & Skaff, 1990). Following Lin, Ye, and Ensel (1999, p. 347), expressive support involves the "use of social relations to share sentiments, seek understandings, vent frustration, and build up self-esteem." On the other hand, instrumental support refers to tangible assistance, such as help with cleaning the house. In the case of caregiving, this help is provided to a care recipient to supplement help from the primary caregiver, especially those who may be working (Scharlach et al., 2007), and is thus provided *on the primary caregiver's behalf* (Pearlin et al., 1990). First, adequate social support may reduce the levels of stress resulting from a threatening event (Cohen & Wills, 1985). Also, social support can reduce the detrimental physical health effects of caregiving, by supporting immune functions and slowing increments in heart rate reactivity and cortisol levels over time (Kim & Knight, 2008). Lastly, social support is also important to reduce conflict between caregiver and care recipient, as well as to improve family function levels (Palmer & Glass, 2003), ultimately helping to ease caregiver burden (Chiou et al., 2009). In this paper, we focus specifically on social support received from friends and family members, also referred to as informal social support. This is distinct from formal help (e.g., help received from paid home-care providers

or center-based services), which play separate roles and have different effects on health outcomes (Kikuzawa, 2016; Scharlach et al., 2007).

Further, there is some evidence that social support benefits caregivers' mental health the most when the support provided to caregivers is expressive, rather than instrumental (Au et al., 2009). Upton and Reed (2006) interviewed 46 caregivers of dementia patients using a phenomenological approach and proposed that for caregivers, knowing that they are thought about and remembered by family members or friends can better help them to better cope with the daily caregiving experience and reduce strain, compared to receiving instrumental help.

While social support is reported to be beneficial for caregivers, its role has been inadequately explored specifically in the context of caregiving-work conflict. Studies of working caregivers tend to focus on formal organizational support (Adams, King, & King, 1996; Allen, 2012; Given et al., 2013; Hammer et al., 2002), and not on social support from family and friends. For instance, there is substantial research on organizational support at the workplace, wherein workplace arrangements and policies (e.g., flexible work arrangements, home-care services) are thought to provide flexibility and reduce the number of instances where caregiving-work conflict may arise (Allen, 2012). While organizational support at the workplace may reduce the frequency of such instances (Allen, 2012; Hammer et al., 2002), the availability of such support for caregivers of older adults is generally less than that for caregivers of children, even though the former are more likely to experience caregiving-work conflict (Gordon et al., 2012; Gordon & Rouse, 2013). Further, use of organizational support is often implicitly deterred by workplace norms and expectations (Allen, 2012; Kim et al., 2013). Thus, it is worthwhile to look at the role of expressive and instrumental social support from family and friends instead. Little is known about how such social support affects working caregivers' experience of strain (Ayman & Antani, 2008), even though the family environment remains the primary locus of care for most older adults (Mehta, 2006a), and the attitudes and behaviour of family members and friends influence that of caregivers and shape their experiences (Hammer et al., 2002).

Due to the paucity of research focusing on social support and caregiving-work conflict in specific, we turn our attention toward what has been found for social support from family and friends and family-work conflict in general. Therein, the demonstration of how social support interfaces with the strain arising from role conflict and/or well-being (measured using a variety of variables such as job stress, burnout and satisfaction) has been limited. Most studies looking at strain arising from family-work conflict focus on social support as being directly associated with reduced strain (Ayman & Antani, 2008), or on the possibility of it reducing strain indirectly by decreasing instances of role conflict (Frone, Yardley, & Markel, 1997). The notion of social support *moderating* the effect of role conflict on strain and/or well-being has been less explored, and if done, has produced inconsistent results across a variety of contexts (Ayman & Antani, 2008). There is thus a need to extend this area of research to the specific arena of caregiving in order to understand how social support from family and friends can play a role for working family caregivers. To our knowledge, no study has evaluated social support as a moderator of the association between caregiving-work conflict and health outcomes.

Family caregiving in Singapore

Similar to other ageing Southeast Asian societies (Lin & Huang, 2015), cultural expectations of filial piety emphasize the family as the primary support system for older Singaporeans (Mehta, 2006a). The Singapore government has largely encouraged the growth of multigenerational households and provided a range of community and home based LTC services to assist family caregivers, aiming for older Singaporeans to 'age-in-place' (Mehta, 2006a). Provision of residential LTC services has thus far been secondary. A unique feature of Singapore's caregiving milieu is the widespread employment of live-in foreign domestic workers (FDWs) by families to assist in caregiving. While support from FDWs has been shown to decrease the negative impact of older adult impairments on family caregivers (Østbye, Malhotra, Malhotra, Arambepola, & Chan, 2013), not much is known about the role of social support from family and friends. Organizational support at the workplace for working family caregivers is not pervasive; according to a recent survey conducted by a trade union, a majority of family caregivers in Singapore do not have such support, and report struggling with their caregiving responsibilities (Goy, 2013).

Therefore, we investigate if expressive social support from family and friends and instrumental social support from family and friends moderate the relationship between care-related work interruptions and depressive symptoms among working family caregivers of older Singaporeans. Considering what previous studies have found for caregivers in general, we hypothesize that:

- 1) Caregivers who experience more care-related work interruptions will have a greater extent of depressive symptoms;
- 2) Association of care-related work interruptions with depressive symptoms will be stronger for caregivers who receive less, versus more, expressive and instrumental social support (i.e. a moderating effect of social support from family and friends);
- 3) The moderating effect will be stronger for expressive, compared to instrumental, social support.

Work interruptions should be understood as just one of the factors affecting caregiver depressive symptoms, amongst others (Malhotra, Malhotra, Østbye, Matchar, & Chan, 2012; Pearlin et al., 1990). Depressive symptoms are known to vary across sociodemographic factors such as age, gender, race, and socioeconomic status (Clarke, Marshall, House, & Lantz, 2011). Additionally, stressors such as poorer health status of the care recipient/caregiver (Mahoney, Regan, Katona, & Livingston, 2005), and/or the presence of problematic behaviour in the care recipient (Roth et al., 2003) may also adversely affect the mental health of caregivers. Similarly, several factors may confound the protective or buffering effects of social support from family and friends. As mentioned earlier, these include the presence of a foreign domestic worker (Østbye et al., 2013) or formal organizational support (Allen, 2012), which may also alleviate the caregiving burden. In the ensuing analysis, we control for these factors to distill the independent effect of work interruptions on caregiver depressive symptoms, and how social support from family and friends moderates this association.

Methods

Data source and analytical sample

We used data from the Singapore Survey on Informal Caregiving (SSIC), conducted in 2010–2011 by the Ministry of Social and Family Development, Singapore. This is a national survey of 1190 dyads, each comprising an older care-recipient (home-dwelling Singaporean aged 75 years and older receiving human assistance for at least one of six activities of daily living [ADLs; bathing, walking, dressing, standing up, toileting and eating]) and his/her primary family caregiver. All respondents were interviewed face-to-face, at home, with informed consent. Further details on the design of the SSIC can be found elsewhere (Malhotra, Chan, Malhotra, & Østbye, 2012). A total of 662 (55.6%) family caregivers who reported working full/part time formed the analytical sample. All measures used in this analysis were caregiver reported.

Key independent variable: Care-related work interruptions

The specific care-related work interruptions considered in this analysis are enumerated in Table 1. Ten items out of Reid, Stajduhar, and Chappell (2010)'s list of thirteen care-related work interruption items were asked in the SSIC. Caregivers answered either yes or no for each item. Mokken scale analysis, a non-parametric item response theory method for dichotomous items, was used to assess scalability of the ten items on a single latent trait (Stochl, Jones, & Croudace, 2012). Results showed good scalability of eight of the ten items (overall Loevinger $H = 0.51$, with no individual item < 0.3) and fit of the data to a Double Monotonicity Model, implying that the eight items were ordered in the same way at all locations on the latent measurement continuum. Two items, 'change jobs or employers' and 'change the shift that you worked', did not fit in the Mokken scaling procedure and were excluded. The remaining eight were summed to form a scale of care-related work interruptions (range 0–8; higher scores indicate experience of more types of interruptions).

Moderator variables: Social support

Expressive social support from family and friends was assessed using Pearlin et al. (1990)'s 8-item scale. This scale includes items such as "You have someone whom you feel you can trust" and "You have at least one friend or relative you can really confide in." Each item was scored on a 4-point scale (strongly disagree (1)/ disagree (2)/ agree (3)/ strongly agree (4)) and added up to form a continuous score (higher scores indicate greater expressive social support; range and Cronbach's alpha in analytical sample: 10–32 and 0.88, respectively).

For instrumental social support, the caregiver was asked the following question: "Thinking about the last one month, in addition to you, did someone else also help (name of care recipient) perform the following activities: (1) eat, (2) dress and undress, (3) take care of his/her appearance, (4) walk, (5) get in and out of bed, (6) take a bath or shower, and (7) use the bathroom or toilet?" For each additional person that helped, caregivers were asked, "Can you tell me the average number of hours this person helps (name of care recipient) perform these activities in a typical week?" The sum of these hours were taken as an indicator of instrumental social support provided to the caregiver from family and friends. This measure

was standardized (i.e. rescaled to have a mean of zero and variance of one) for the analysis to capture the position of each observation relative to others in the sample.

Dependent variable: Caregiver depressive symptoms

A modified version of the 11-item Center for Epidemiologic Studies Depression (CES-D) scale (Kohout, Berkman, Evans, & Cornoni-Huntley, 1993) assessed caregiver depressive symptoms (Cronbach's alpha in analytical sample: 0.73). Each item was scored 0 (none/rarely), 1 (sometimes) or 2 (often), the total score on the scale ranging from 0 to 22; higher scores indicate a greater extent of depressive symptoms in the past week. While a cut-off score of seven has been previously used to demarcate the presence of clinically significant depressive symptoms (CSDS) for this scale (Yokoyama et al., 2008), we use the continuous score in order to achieve better statistical power (Bhandari, Lochner, & Tornetta, 2002).

Covariates

A number of caregiver and care recipient related variables, some measured through established scales, were included as covariates in the analysis.

Positive aspects of caregiving (PAC) scale: The PAC scale (Tarlow et al., 2004) (score: 9–45; higher scores indicate more positive feelings derived from caregiving), was included given evidence that caregiving also benefits caregivers (Haley, LaMonde, Han, Burton, & Schonwetter, 2003) and may potentially confound the relationship of interest since a lower CES-D score may be due to personal satisfaction from caregiving, instead of social support. This scale has recently been validated in the Singapore context (Siow, Chan, Østbye, Cheng, & Malhotra, 2017).

Revised Memory and Behaviour Problems Checklist (RMBPC): To account for the effects of the care recipient's problematic behavior on caregiver's depressive symptoms (Roth et al., 2003), the frequency of memory, mood and behavioural problems of the care recipient were measured using the Revised Memory and Behaviour Problems Checklist (Teri et al., 1992); score: 0–96; higher scores indicate greater frequency.

In addition to the PAC, caregiver related covariates included age, ethnicity (Chinese/Malay/Indian/Others), gender, relationship to care-recipient (spouse/child/other), marital status (married/non-married), living arrangements (living alone/living with spouse only/living with child only/living with both spouse and child/living with others only), perceived financial adequacy (some difficulty meeting expenses/no difficulty meeting expenses), number of chronic illnesses, nature of work (full-time/part-time), work hours per week, total number of years worked, presence of a dependent (18 years or less) in the caregiver's household, caregiving responsibility of someone other than the care-recipient.

Care-recipient related covariates, in addition to the frequency of memory, mood and behavioural problems assessed using the RMBPC, were gender, age, number of chronic illnesses, number of ADL limitations, and receipt of help/care from other sources – i) receipt of help with ADLs from a FDW in the past month (yes/no) and ii) use of formal care

services (adult day care or day rehabilitation centres/respite care at a community hospital or nursing home/home help or medical or nursing or therapy services) in the past year (yes/no).

Statistical analysis

First, ordinary least squares (OLS) regression was used to assess the association between care-related work interruptions and caregiver depressive symptoms, controlling for expressive and instrumental social support. Interaction terms of care-related work interruptions with expressive social support and with instrumental social support were subsequently added to the model to test for moderation by the two types of social support. Only significant interaction terms were retained. Covariates were then included in the final model to address confounding. All models used Huber-White sandwich estimators (with STATA's *robust* subcommand) to account for error-term heteroscedasticity. All analyses were conducted in STATA 13.1.

Results

A third of the caregivers had experienced at least one type of care-related work interruption, the most common being that of having to leave work for a doctor's appointment pertaining to the care-recipient (26.7%, see Table 1). Tables 2 and 3 present various caregiver and care-recipient characteristics. Additionally, 14.1% of caregivers had depressive symptom scores indicative of CSDS.

Table 4 presents the OLS regression estimates. Model 1 showed that care-related work interruptions were significantly associated with caregiver depressive symptoms ($\beta = 0.41$, $p < 0.001$), net of social support measures. An increase in expressive social support was associated with a significant decrease in extent of caregiver depressive symptoms ($\beta = -0.17$, $p < 0.001$), but instrumental social support was positively associated with caregiver depressive symptoms instead ($\beta = 0.22$, $p < 0.05$). In Model 2, the interaction term for care-related work interruptions with expressive social support was added, which was statistically significant ($\beta = -0.08$, $p < 0.01$) and showed a significant improvement in model fit. The interaction term for care-related work interruptions with instrumental social support was added in Model 3. However, the interaction term was not statistically significant and its inclusion did not demonstrate a significant improvement in model fit. Model 4 shows estimates from the final model, which included variables observed to be significant in Model 3 and all for caregiver and care recipient related covariates. Results remained largely consistent with Models 2 and 3, with expressive social support demonstrating a significant moderation effect. Instrumental social support continued to show a statistically significant direct effect of *increasing* depressive symptoms in Model 4 ($\beta = 0.25$, $p < 0.05$).

The moderating effect of expressive social support is represented graphically in Figure 1 - the magnitude and significance of the association of care-related work interruptions with the extent of caregiver depressive symptoms decreases with an increase in expressive social support. For instance, for caregivers with low expressive social support score (-1 SD), the coefficient of the effect of care-related work interruptions on depressive symptoms (i.e. the simple slope) is 0.48 ($p < 0.001$). However, for caregivers with a high expressive social support score ($+1$ SD), the simple slope reduces to 0.07 ($p = 0.57$).

Conclusions

The current study, to our knowledge, is the first to assess the role of social support from family and friends as a moderator of the association of care-related work interruptions with caregiver depressive symptoms. Empirical support was found for our a priori hypotheses. More types of care-related work interruptions were associated with an increase in the extent of caregiver depressive symptoms. Expressive, but not instrumental, social support moderated this association. Moderation only by expressive social support therefore provided partial support for Hypothesis 2 and full support for Hypothesis 3. It is possible that by functioning as a reassurance of a caregiver's self-worth (Upton & Reed, 2006), a reliance on expressive social support may reduce the stress resulting from work interruptions (Cohen & Wills, 1985), or reduce the caregiver-care recipient conflict caused by work interruptions (Chiou et al., 2009). On the other hand, instrumental support provided by a secondary caregiver may lead to more stress if they are inadequate, or are not similarly invested in doing the task (Given et al., 2013). This may be part of the reason why in our final model, an increase in instrumental support was associated with an increase in depressive symptoms. While the benefit of expressive social support for the mental health of family caregivers in general is well-documented in the literature (Demirtepe-Saygili & Bozo, 2011; Pearlin et al., 1990; Upton & Reed, 2006), empirical support for its positive role specifically among working family caregivers, especially with regard to the particular stressors it may help to alleviate, were largely lacking. In this study, we highlighted one possible pathway through which expressive social support may alleviate the negative health effects of maintaining dual roles of work and caregiving, that is, by reducing the strength of the association between work interruptions and depressive symptoms.

Further, we do not observe a positive role of instrumental support from family and friends; this accords with prior studies emphasizing the primacy of expressive support over instrumental support for caregiver well-being (Au et al., 2009; Upton & Reed, 2006). One plausible explanation for this phenomenon is Cunningham and De La Rosa (2008, p. 279)'s observation that when "aspects of an environment cannot be controlled, emotion-focused coping techniques may be more effective than problem-focused coping techniques." In this case, care-related work interruptions may be perceived as uncontrollable, since one cannot fully predict when a care-recipient may need help. Although this explanation is contrary to Gordon et al. (2012)'s theoretical assumption that work is less controllable than elder caregiving, we believe this is likely reversed in the Asian context due to cultural expectations of filial piety and centrality of the family (Mehta, 2006a). The dominant cultural expectation places an obligation to look after one's family members, even at the cost of interrupting work or giving it up completely (Goy, 2013; Mehta, 2006b). Expressive social support may therefore be more effective in helping Singaporean caregivers than instrumental support, since care-related work interruptions are often perceived as uncontrollable.

Strengths of this study include its large, national sample of working family caregivers, comparable to other studies using American data such as the National Long-Term Care Survey (Kim et al., 2013) ($n=652$) or the Health and Retirement Study (Lee et al., 2001) ($n=527$, of which only 221 were working caregivers). This enabled us sufficient power to test for higher order terms and discover *moderating* effects (Shieh, 2009), in contrast to other

smaller studies (e.g., Adams et al., 1996; Reid et al., 2010). We used the more stringent Mokken scaling procedure for scaling care-related work interruption items, instead of relying on the Cronbach's alpha as in Reid et al. (2010).

Our study however has its limitations. All measures used were based on caregiver self-report – an inherent feature of large community surveys. Following Reid et al. (2010), the SSIC asked about care-related work interruptions without delimiting the time frame; future studies should consider imposing a time period to reduce recall bias. Further, the scale we created assesses how many different *types* of work interruptions are experienced, but not their *frequency*, which may also impact caregivers' well-being. The association of care-related work-interruptions with caregiver mental health also needs to be explored over time; any conclusions about causal directions in our study are limited by its cross-sectional design. The SSIC did not assess receipt of expressive or instrumental support specifically from co-workers or of organizational support at the workplace, but the latter is likely to be low (Goy, 2013). It remains unclear how different types of support from the workplace or from family and friends function together to impact caregiver well-being, since most studies focus on one or the other, or on specific types of support only. Future studies should consider integrating multiple types of support from multiple sources (i.e. both from the workplace and from family and friends outside the workplace). This study also did not consider how specific occupations, such as in the case of 'double-duty' caregivers, may modify the effect of work interruptions and social support (Boumans & Dorant, 2014). We were also unable to determine if caregivers had switched from full- to part-time work due to caregiving responsibilities. Lastly, the instrumental social support measure focused on the quantity, and not the perceived quality of the help provided to the care recipient. The latter may help to explain why instrumental support is related to increased depressive symptoms in our analysis.

Nonetheless, our findings have important research and policy implications. First, for policymakers, measures to improve care infrastructure for older adults should encompass the caregivers' experience at work, given that caregiving-work conflict can be detrimental for caregivers' mental health, as we observe, and this may in turn affect care-recipients (Malhotra et al., 2016). With Singapore's ageing population and the raising of the statutory retirement age, the population of working caregivers is likely to increase further. More attention and resources should be channelled to the mental well-being of such caregivers, especially given the relative lack of workplace-based caregiver support in Singapore (Goy, 2013).

Second, in order to address caregiving-work conflict, both policymakers and employers should recognize that formal workplace-based caregiver support needs to be supplemented with expressive support. Stoltz, Udén, and Willman (2004, p. 117)'s qualitative findings suggest that today, "care and services are 'given' to family carers, rather than being negotiated and individually tailored to their needs." Highlighting that family caregivers do not use respite services (even though it is reported to be the 'most wanted' service), they conclude that services currently provided tend to be instrumental in nature, which may not be appreciated by the majority of caregivers, who covet expressive support instead. It is interesting to note that in our study only a small percentage of working caregivers (5.3%)

reported that their performance at work was affected as result of caregiving duties, which indicates that employers may not be able to identify employees who are facing role conflict solely from monitoring work performance. We suggest that in addition to proactively identifying working caregivers and subsequently making support groups and counselling available to them, policymakers should target other individuals within the caregivers' social network as well, such as educating family members and friends about the psychological and emotional needs of caregivers (Schulz & Martire, 2004). Employers may adopt flexible working policies not merely to accommodate caregiving needs but also to allow working caregivers to reconnect with their families as a form of respite, in addition to facilitating their engagement in other leisure activities outside of work (Utz et al., 2012). Family members and friends should also make it a point to maintain regular social contact with caregivers, since caregivers may simply wish to network with peers for learning needs or other social purposes, independent of caregiving activities (Stoltz et al., 2004). Although this study focused solely on social support from family and friends, expressive support specifically from supervisors or co-workers can also moderate the negative effects of work interruptions (Ayman & Antani, 2008; Kim et al., 2013), and should be encouraged.

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Fig 1.

Average Marginal Effects of Care-related Work Interruptions on Caregiver Depressive Symptom Score, by Expressive Social Support Score

Notes: Dotted lines indicate 95% *CI*.

Table 1:Distribution of Care-related Work Interruption Items ($N=662$)

Care-related Work Interruptions ^a	%
Because of caring for (name of CR), have you ever...	
...needed to leave work for doctor's appointment pertaining to (name of CR)?	28.7
...had to come late to work?	9.5
...been interrupted frequently by phone calls from or pertaining to (name of CR)?	8.9
...decreased the hours you worked?	6.2
...felt that your performance at work was affected?	5.3
...missed work?	5.1
...increased the hours you worked?	4.4
...declined job advancement (transfer or promotion)?	2.3
At least one type of care-related work interruption	33.1
Number of types of care-related work interruptions experienced	2.1 (1.5) ^b

Notes: CR = Care-recipient;

^aThe two items excluded due to poor scalability were 'changed the shift you worked?' (3.6%) and 'changed jobs or employers?' (2.6%);^bNumber reflects the mean (*SD*) for those who reported at least one work interruption.

Table 2:**Characteristics of Caregivers in Sample**

Description	Proportion in % or Mean (SD) (N=662)
Depressive symptom score	3.3 (2.9)
Expressive social support score	24.5 (2.8)
Instrumental social support (hours per week of ADL help provided to care-recipient on behalf of the caregiver)	33.0 (30.7)
Gender	
Male	52.0
Female	48.0
Age (in years)	50.8 (8.3)
Ethnicity	
Chinese	63.1
Malay	29.2
Indian	7.1
Other	0.6
Relationship to Care-Recipient	
Child	91.8
Spouse	1.4
Other	6.8
Marital Status	
Married	59.1
Separated/Divorced/Widowed/Never married	40.9
Living Arrangements	
Alone	1.8
With spouse only	7.0
With child only	61.6
With spouse and child	26.7
With others only	2.9
Perceived financial adequacy	
Some difficulty	42.2
No difficulty	57.8
Number of chronic illnesses	0.8 (1.3)
Nature of work	
Full-time	83.8
Part-time	16.2
Work hours per week	44.2 (14.1)
Number of years worked in total	26.2 (9.8)
Caregiving responsibility of someone other than the care-recipient ^a	8.3
Presence of a dependent (<18 years old) in household ^a	32.9
Positive aspects of caregiving score	37.4 (5.7)

Notes:

^aNumbers refer to proportion of people who reported “yes” to these items.

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Table 3:

Characteristics of Care-Recipients in Sample

Description	Proportion in % or Mean (SD) (N=662)
Gender	
Male	26.7
Female	73.3
Age (in years)	83.6 (5.5)
Number of chronic illnesses	4.1 (2.4)
Number of ADL limitations	4.6 (2.3)
RMBPC score	13.9 (12.5)
Receipt of help in ADL from foreign domestic worker in past month	59.4
Use of any formal care service in past year	13.0

Notes: ADL = Activities of Daily Living; RMBPC = Revised Memory and Behaviour Problems Checklist.

Table 4:

Results from OLS Regression of Care-related Work Interruptions and Social Support on Caregiver Depressive Symptoms

Variables	β coefficient (Standard error)			
	Model 1	Model 2	Model 3	Model 4
Focal Variables				
Care-related Work Interruptions	0.41 *** (0.08)	2.44 *** (0.68)	2.35 ** (0.68)	1.91 ** (0.61)
Expressive social support score	-0.17 *** (0.04)	-0.11 * (0.05)	-0.11 * (0.05)	-0.08 (0.05)
Instrumental social support (standardized hours per week)	0.22 * (0.11)	0.23 * (0.11)	0.27 * (0.11)	0.25 * (0.12)
Expressive social support score x Care-related Work Interruptions		-0.08 ** (0.03)	-0.08 ** (0.03)	-0.07 ** (0.03)
Instrumental social support x Care-related Work Interruptions			-0.06 (0.08)	
Covariates				
CG relationship to primary care-recipient				
Child				Ref.
Spouse				0.09 (0.95)
Other				-0.02 (0.54)
CG Gender				
Male				Ref.
Female				0.54 (0.29)
CG age				0.01 (0.02)
CG Ethnicity				
Chinese				Ref.
Malay				0.58 * (0.29)
Indian				1.52 ** (0.47)
Others				1.26 (2.00)
CG Marital Status				
Married				Ref.

Variables	β coefficient (Standard error)			
	Model 1	Model 2	Model 3	Model 4
Separated/Divorced/Widowed/Never married				-0.18 (0.31)
CG Living Arrangements				
Alone				0.29 (0.72)
With spouse only				0.38 (0.52)
With child only				Ref.
With spouse and child				0.21 (0.39)
With others only				0.69 (0.72)
Perceived financial adequacy				
Some difficulty				Ref.
No difficulty				-1.26*** (0.25)
Number of chronic illnesses				0.06 (0.12)
Nature of work				
Part-time				Ref.
Full-time				-0.34 (0.37)
Number of years worked in total				0.01 (0.02)
Work hours per week				0.01 (0.01)
Caregiving responsibility of someone other than the care-recipient				0.25 (0.37)
Presence of a dependent (<18 years old)				-0.02 (0.27)
Positive aspects of caregiving score				-0.05* (0.02)
CR Gender				
Male				Ref.
Female				0.41 (0.23)
CR age				-0.02 (0.02)

Variables	β coefficient (Standard error)			
	Model 1	Model 2	Model 3	Model 4
CR number of chronic illnesses				0.03 (0.05)
RMBPC score				0.04** (0.01)
Number of ADL limitations				0.10 (0.05)
Receipt of help in ADL from foreign domestic worker in past month				-0.40 (0.25)
Use of any formal care service in past year				0.23 (0.33)
Constant	7.30*** (1.09)	5.63*** (1.29)	5.69*** (1.29)	6.04* (2.35)
<i>N</i>	662	662	662	662
Adjusted R^2	0.07	0.08	0.08	0.21
<i>F</i> -value for change in R^2	-	9.52**	0.60	5.44***

Notes:

*
 $p < 0.05$,

**
 $p < 0.01$,

 $p < 0.001$;

CG = Caregiver; CR = Care-Recipient; ADL = Activities of Daily Living; RMBPC = Revised Memory and Behaviour Problems Checklist.