

REVIEW ARTICLE

Intergenerational relationships and caregiving burden among family caregivers of older adults: A systematic review

Xiachun Ke, Yuanyuan Fu*

School of Social Development and Public Policy, Beijing Normal University, Beijing, China

Abstract: Although intergenerational relationships play a significant role in maintaining the well-being of both caregivers and care recipients, few studies have examined how intergenerational relationships influence caregiving burden, especially for adult-child caregivers. A systematic search of electronic databases, including Scopus, Web of Science, and PsycINFO, was conducted across quantitative studies published in English in 2012 – 2022 to provide a summary of (1) the operationalization of caregiver burden and intergenerational relationships used in this field and (2) the effect of intergenerational relationships on caregiver burden. Intergenerational relationships are rarely defined, and they are operationalized in multiple and diverging ways. The eight included papers showed varying results but generally indicated that intergenerational relationships exert a great influence on caregiver burden. Further examination of the impact of intergenerational relationships on caregiver burden is an indispensable prerequisite for interventions that could positively influence the health outcome of adult-child caregivers.

Keywords: Adult-child caregivers; Caregiver burden; Caregiving burden; China; Intergenerational relationship; Older adults; Systematic review

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***CORRESPONDING AUTHOR**

Yuanyuan Fu,
North Main Building 2003,
19 Xijiekou Wai St.,
Beijing, China.
fuyuan00@163.com

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1. Introduction

Demographic aging, as a result of the decline in fertility rates and the increase in life expectancies, has brought serious economic and health challenges globally. The United Nations has reported that the proportion of the world's population over 60 years or old is projected to increase from 14% in 2022 to 22% in 2050 (United Nations, 2022), which will undoubtedly create a huge care demand worldwide. However, in many countries, institutional care and community-based care have not been well developed, and family caregivers still bear the primary responsibility for providing long-term care for older adults (Hoffmann and Rodrigues, 2010).

Family members, as untrained informal caregivers, are faced with practical challenges related to learning new skills and adopting new responsibilities, including providing practical help, personal care, psychological support, transport, and coordination of treatment (Stenberg, Ruland, and Miaskowski, 2010), which may strain caregivers' physical, financial, and psychosocial resources (Pearlin, Mullan, Semple, *et al.*, 1990). Caregiver burden has been the most commonly reported negative outcome in caregiving (Aung, Aung, Moolphate, *et al.*, 2021; Tramonti, Barsanti, Ghicopulos, *et al.*, 2013; Ugargol and Bailey, 2018), which may lead to emotional distress (Clyburn, Stones, Hadjistavropoulos, *et al.*, 2000), poor health, and decreased quality of life (Iecovich, 2008).

Researchers have recently shown great interest in how the relationship between caregivers and care recipients influences family caregivers' burden. However, most studies

have focused on spousal caregivers (Liu and Lou, 2019; Swinkels, Broese van Groenou, de Boer, *et al.*, 2019; Wagner and Brandt, 2018), whereas fewer studies have focused on adult-child caregivers and the impacts of intergenerational relationships on caregiver burden.

Despite the growing interest in this area, review studies are sparse. Solomon *et al.* (2015) reviewed how the relationship quality affects the well-being of mother-daughter care dyads. When the relationship quality is positive, mother-daughter dyads enjoy rewards and mutuality. When the relationship quality is ambivalent or negative, burden, conflicts, and blames conspire, creating a destructive cycle. A recent systematic review and meta-analysis paper focused on the relationship between filial piety and caregiving burden among adult children (Pan, Chen, and Yang, 2022). Filial piety is a key Chinese culture value that determines children's attitudes and behaviors toward their parents (Dong, Zhang, and Simon, 2014), and older Chinese tend to have a strong perception of filial piety, which prescribes that adult children should take the responsibility of caring for them at home (Tang, Wu, Yeung, *et al.*, 2009). Filial piety greatly influences people's behaviors as well as intergenerational relationships (Kim, Kim, and Hurh, 1991). Pan *et al.* (2022) concluded that stronger filial piety may lessen caregiver burden after analyzing 12 studies. Existing literature indicated that intergenerational relationships are related to caregiver burden, unfortunately, no review studies are available to provide a systematic and comprehensive review of the empirical studies about the effect of intergenerational relationships on caregiver burden. Therefore, the purpose of this systematic review is to clarify (1) the operationalization of caregiver burden and intergenerational relationships used in this field and (2) the effect of intergenerational relationships on caregiving burden among adult children. A clearer understanding of this relationship may help validate theories and guide future studies in this field.

2. Methods

2.1. Search strategy

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement (Page, McKenzie, Bossuyt, *et al.*, 2021) serves as the framework for this systematic review. The PRISMA statement published in 2009 is a reporting guideline designed to help systematic reviewers transparently report why the review was done, what the authors did, and what they found (Moher, Liberati, Tetzlaff, *et al.*, 2009). Over the past decade, advances in systematic review methodology and terminology have necessitated an update to the guideline. The PRISMA 2020 statement replaces the 2009 statement and includes new reporting guidance that reflects advances in methods to identify, select, appraise, and synthesize studies.

A series of literature searches were conducted in June 2022 using PsycINFO, Web of Science, and Scopus to investigate papers that met our inclusion criteria. Our search terms were ["caregiver" OR "caregiving" OR "carer" OR "support provider" OR "caring"] AND ["elder" OR "elderly" OR "old age" OR "older" OR "aged" OR "geriatric" OR "aging" OR "seniors"] AND ["burden"] AND ["filial" OR "intergenerational" OR "trans-generational" OR "multi-generational" OR "inter-generational" OR "child-parent" OR "parent-child"] in either [TITLE] or [ABSTRACT]. The database search limiters involved being written in English and published between 2012 and 2022.

2.2. Inclusion and exclusion criteria

Articles were required to meet the following inclusion criteria: (a) Adult-child caregivers of older adults aged 60 and over were the study population; (b) intergenerational relationships within the adult-child caregiver-care recipient dyads and caregiver burden comprised the focus of the study; and (c) original quantitative studies were included, but we removed qualitative studies, randomized controlled trials, case-control studies, systematic reviews, and meta-analyses. That is because the purpose of this systematic review is to clarify (1) the operationalization of caregiver burden and intergenerational relationships used in this field and (2) the effect of intergenerational relationships on caregiving burden among adult children. For this purpose, compared to other research designs, quantitative studies can help us get a more specific understanding of the operationalization and specific relationship.

The results of the systematic search are shown in the PRISMA flow diagram (Moher, Liberati, Tetzlaff, *et al.*, 2009; Page, McKenzie, Bossuyt, *et al.*, 2021) (Figure 1). We identified a total of 724 records in the initial search, and three additional articles were added through citations and references from retrieved publications and researchers' knowledge. After removing 151 duplicates and 513 irrelevant records through the title and abstract screening, 63 articles were retained for full-text sorting. Fifty-five full-text articles were excluded for the following reasons: (a) Two studies were not about caregivers of 60+ older adults; (b) 35 studies did not focus on intergenerational relationships; (c) eight studies did not focus on caregiver burden, and (d) 10 studies were not quantitative. The two authors performed the entire selection process independently to ensure consistent and complete screenings of all eligible studies. Eight studies were finally included in the structured full paper review for data extraction and synthesis. The detailed data extraction results are shown in Table 1.

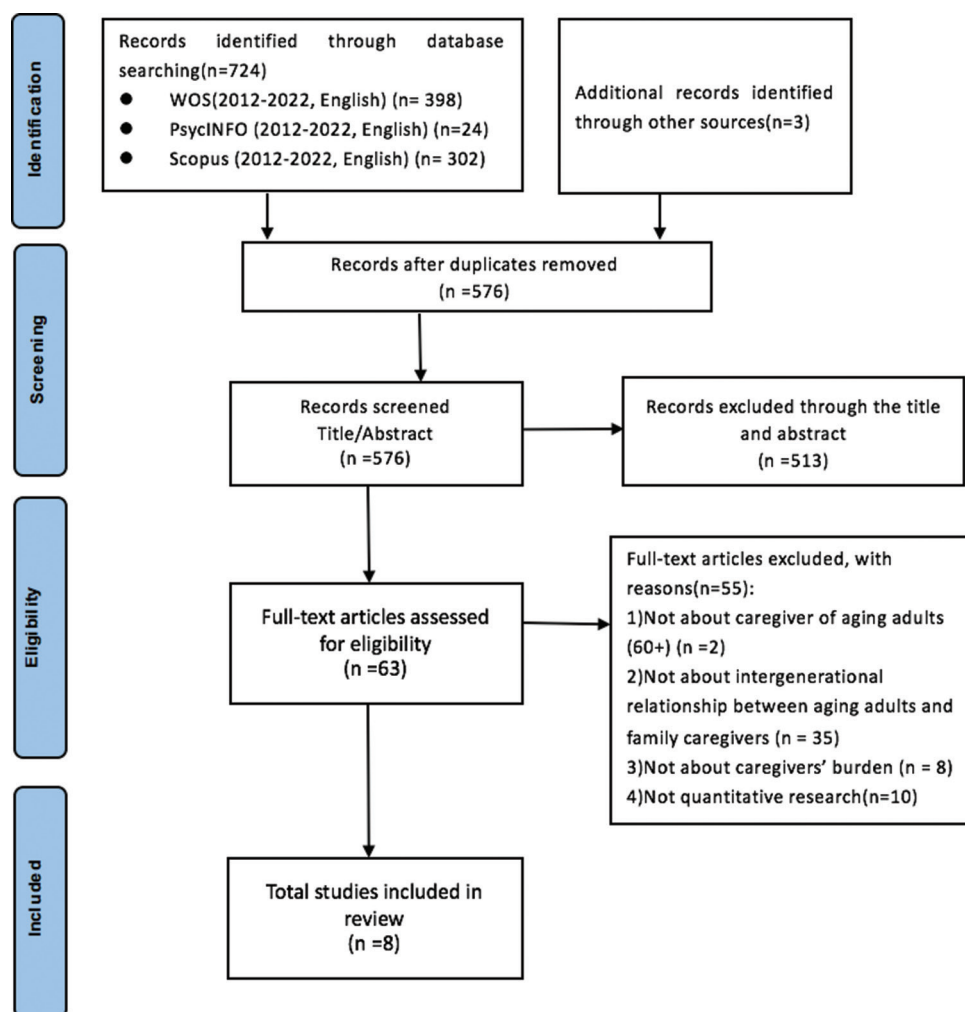


Figure 1. Literature search and selection process.

3. Results

3.1. Study characteristics

We utilized a pre-developed data extraction template to synthesize study characteristics from each study, and a summary of the eight included studies is found in Table 1.

All eight studies used a cross-sectional design. Concerning the characteristics of the care recipients, only Enright *et al.* (2020) targeted older adults with dementia, whereas other studies did not specifically restrict the health status of the care recipients. Regarding the characteristics of caregivers, five studies included only adult children as caregivers (Aires, Mocellin, Fengler, *et al.*, 2017; Lin, Chen, and Li, 2012; Liu and Bern-Klug, 2016; Queluz, de Santis, de Fatima Kirchner, *et al.*, 2022; Wu, Liu, Cao, *et al.*, 2021). The kinship between caregivers and care recipients in the other three studies was more diverse. Lopez-Anuarbe and Kohli (2019) focused on male caregivers, with sons accounting for approximately 50%, and del-Pino-Casado *et al.* (2014) focused on primary home caregivers of older relatives, with children accounting for 60.1%. In both studies, the researchers conducted separate analyses of the children subgroup and thus were included in this review. Enright *et al.* (2020) adopted a small sample size; the participant sample included 58 informal caregivers of persons with dementia, including 20 adult children. This study was also included in this review because of the relatively large proportion of children in the sample, which matched our research focus. In addition, regarding sample site and size, three studies were based on data from China (Lin, Chen, and Li, 2012; Liu and Bern-Klug, 2016; Wu, Liu, Cao, *et al.*, 2021), and some studies used a national database (Liu and Bern-Klug, 2016; Lopez-Anuarbe and Kohli, 2019; Wu, Liu, Cao, *et al.*, 2021).

Table 1. Detailed data extraction result.

Authors; year	Study design; location; year	Sample size; kinship	Study aim	Basic theory	Intergenerational relationship-related variable (V); measurement (M)	Caregiver burden measurement	Summary of main results
(Aires, Moecllin, Fengler, et al., 2017)	Cross-sectional; Brazil; 2015	<ul style="list-style-type: none"> • 100 caregiver children of older adults • daughters (n=74) • others (n=26) 	Analyze the association between filial responsibility and the overload of the children when caring for their older parents	NA	<ul style="list-style-type: none"> • V=care behaviors • M=instrumental support (ADLs/IADLs), emotional support, financial support, keeping company, and visits 	Caregiver Burden Inventory (CBI; Novak and Guest, 1989)	Children who were more involved with the ADLs and provided financial support showed higher levels of overload
(del-Pino-Casado, Millán-Cobo, Palomino-Moral, et al., 2014)	Cross-sectional; Spain; 2010	<ul style="list-style-type: none"> • 208 primary home caregivers of older relatives (65 years of age and over) • offspring (n=125) • spouse (n=64) • others (n=19) 	Analyze the effect of cultural factors on the subjective burden of primary home caregivers of older relatives	NA	<ul style="list-style-type: none"> • V=reciprocity • M=“The care recipient is very grateful, and this gratifies and compensates me.” 5-point Likert-type scale (strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree) 	Caregiver Strain Index (CSI; Robinson, 1983)	The subjective burden was negatively associated with reciprocity in the offspring group
(Enright, O’Connell, Branger, et al., 2020)	Cross-sectional; Canada; 2009	<ul style="list-style-type: none"> • 58 informal caregivers of persons with dementia • sons (n=3) daughters (n=17) • spouse (n=35) • others (n=3) 	Examine the associations between informal caregivers’ perception of identity change in their care partner, the quality of the caregiver/care recipient relationship, and caregiver burden	NA	<ul style="list-style-type: none"> • V=relationship quality • M=Burns Relationship Satisfaction Scale (BRSS; Burns, Sayers, and Moras, 1994; Heyman, Sayers, and Sayers, 1994) 	Zarit Burden Interview (ZBI; Zarit, Orr and Zarit, 1985)	Current caregiver/care recipient relationship quality significantly moderates the association between perceived identity change and caregiver burden
(Lin, Chen, and Li, 2012)	Cross-sectional; Taiwan; NA	<ul style="list-style-type: none"> • 502 adult children who were married and had parents who were over 65 years old • sons (n=198) • daughters (n=304) 	Figure out the relationship among depression, parent-child relationships, and caregiver burden	Conservation of resources theory	<ul style="list-style-type: none"> • V=parent-child relationship satisfaction • M=“I get along well with my parent” and “I am satisfied with the relationship with my parent.” 5-point Likert-type scale (strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree) 	Burden Assessment Scale (BAS; Reinhard and Horwitz, 1995)	Caregiver’s burden significantly influences caregiver’s levels of depression; a better parent-child relationship would weaken the relationship between burden and depression
(Liu and Bern-Klug, 2016)	Cross-sectional; China; 2005(CLLHS)	<ul style="list-style-type: none"> • 895 dyads of adult-child caregivers and their oldest parent • sons (n=392) • daughters (n=503) 	Examine one dimension of caregiver burden “worry about performance” (WaP) and investigate whether variables inspired by Pearlín’s stress process model help to explain the variation of WaP	Pearlín’s Stress Process Model	<ul style="list-style-type: none"> • V=caregiver’s perception of emotional closeness with the parent • M=“I have a close relationship with my parent.” (1= completely agree, 2= agree, 3= disagree, and 4= completely disagree) 	Worry about performance: two items from the ZBI, that is, “Do you feel you should be doing more for your parent?” and “Do you better job in caring for your parent?”	Emotionally close relationship with the parent will significantly increase WaP

(Contid...)

Table 1. (Continued).

Authors; year	Study design; location; year	Sample size; kinship	Study aim	Basic theory	Intergenerational relationship-related variable (V); measurement (M)	Caregiver burden measurement	Summary of main results
(Lopez-Anuarbe and Kohli, 2019)	Cross-sectional; USA; 2011 and 2015	<ul style="list-style-type: none"> • 2007 caregivers in 2011 and 2204 in 2015 • sons (54% in 2011 and 53% in 2015) husbands/spouses/partners (26% in 2011 and 28% in 2015) 	Figure out the impact of caregiver characteristics, tasks, and resources on caregiving burden of male caregivers as spouses, sons, and other caregivers	The stress appraisal model	<ul style="list-style-type: none"> • V=felt appreciated by the care recipient • M= "Does the elderly care recipient appreciate you?" (binary: Yes or no) 	Is helping the recipient emotionally/financially/physically difficult for you? (binary: Yes or no)	For sons, feeling appreciated by the care recipient was significantly linked to lower emotional burden in 2015, but not significant in 2011 and other kinds of burden
(Queiroz de Santis, de Fatima Kirchner, et al., 2022)	Cross-sectional; Brazil; NA	<ul style="list-style-type: none"> • 138 caregivers who were children of elderly people who needed help due to physical, cognitive, or both types of dependency • sons (10.9%) daughters (89.1%) 	Verify (a) if a positive interaction and the presence of conflicts in dyads with an adult-child caregiver and an older adult care recipient are related to caregivers' mental health problems (specifically burden and depression) and (b) if the presence of burden and depression in a child caregiver can predict the absence of positive interaction and the presence of conflicts in the dyad	NA	<ul style="list-style-type: none"> • V=dyadic relationship • M=Brazilian version of the Dyadic Relationship Scale (Sebern and Whitlatch, 2007) 	ZBI	<ul style="list-style-type: none"> • The positive interaction between the dyad and the presence of conflicts were, respectively, negatively and positively correlated with burden • The presence of burden was predictive of a worse interaction between the dyad and the presence of conflicts
(Wu, Liu, Cao, et al., 2021)	Cross-sectional; China; 2005 (CLHLS)	<ul style="list-style-type: none"> • 168 dyads of adult-child caregivers and their parents • sons (n=108) daughters (n=60) 	Describe the characteristics of oldest-old Chinese with disability and their adult-child caregivers and the extent to which these characteristics are associated with caregiver burden	NA	<ul style="list-style-type: none"> • V1=the relationship with the care recipient • V2=willingness to provide care • M1=not very close versus very close • M2=willing to do versus without patience/need respite care/unwilling to do 	ZBI	<ul style="list-style-type: none"> • No significant association was found between close relationships and burden • No significant association was found between willingness to provide care and burden

NA: Not available, specified, or reported

3.2. Relevant theoretical framework

The majority of studies in our review did not adopt a well-established conceptual framework. However, the Pearlin's Stress Process Model (Pearlin, Mullan, Semple, *et al.*, 1990) was used in Liu and Bern-Klug's study (2016). In the Pearlin's Stress Process Model, secondary stressors refer to stressful experiences triggered by primary stressors. This model indicated that the psychosocial resources of caregivers, like the closeness with the care recipients, may influence the secondary stressors.

In addition, the study by Lopez-Anuarb and Kohli (2019) was based on the caregiving stress appraisal model (Yates, Tennstedt, and Chang, 1999), which draws on both the Stress Process Model developed by Pearlin *et al.* (Pearlin, Mullan, Semple, *et al.*, 1990) and the Appraisal Model proposed by Lawton *et al.* (Lawton, Kleban, Moss, *et al.*, 1989; Lawton, Moss, Kleban, *et al.*, 1991). The Appraisal Model relates how caregivers appraise stressful situations with their reactions to them. Therefore, if the caregiver feels that his/her personal and family relationship with the recipient is positive and in line with his/her caregiver duties, family roles, and available resources, his/her burden will be easier to bear and may be lower.

Another study (Lin, Chen, and Li, 2012) was based on the conservation of resources (COR) theory (Hobfoll, 1989). Based on COR, the threat of resource loss becomes a stressor for the individual, which will give rise to psychological distress. In contrast, an individual who has sufficient resources is better at meeting challenges and preventing negative influences from stress. Therefore, positive parent-child relationships will improve caregivers' psychological resources that help mitigate the stress of caring, while negative relationships will consume caregivers' resources and lead to stress.

3.3. Tools for caregiver burden and intergenerational relationships

This systematic review tries to unravel the relationship between intergenerational relationships and caregiver burden, so we further explored how researchers have operationalized these two concepts. Six studies used caregiver burden as an outcome variable in their studies (Aires, Mocellin, Fengler, *et al.*, 2017; del-Pino-Casado, Millán-Cobo, Palomino-Moral, *et al.*, 2014; Enright, O'Connell, Branger, *et al.*, 2020; Liu and Bern-Klug, 2016; Lopez-Anuarbe and Kohli, 2019; Wu, Liu, Cao, *et al.*, 2021). One study used burden as a predictor variable for caregiver depression (Lin, Chen, and Li, 2012), whereas another study viewed burden as both an outcome and a predictor factor in the dyadic relationship (Queluz, de Santis, de Fatima Kirchner, *et al.*, 2022). Regarding measurement tools, four studies used or partially used the Zarit Burden Interview (ZBI) to measure caregiver burden (Enright, O'Connell, Branger, *et al.*, 2020; Liu and Bern-Klug, 2016; Queluz, de Santis, de Fatima Kirchner, *et al.*, 2022; Wu, Liu, Cao, *et al.*, 2021). This scale was developed by Zarit in the 1980s to evaluate the caregiver burden of dementia patients and is composed of 22 items, with a total score range of 0 – 88 (higher scores indicate heavier caregiver burden) (Zarit, Orr and Zarit, 1985). Other scales included the Burden Assessment Scale (BAS), the Caregiver Burden Inventory (CBI), and the Caregiver Strain Index (CSI). Only one study used a binary question rather than a scale to confirm whether caregivers had emotional/financial/physical burdens (Lopez-Anuarbe and Kohli, 2019). In conclusion, in most of these studies, the researchers tended to assess caregiver burden from a comprehensive perspective, including subjective burden and objective burden.

On the other hand, the tools measuring intergenerational relationships were more diverse. For the following analysis, measurements have been divided into three categories based on the solidarity perspective and conflict perspective: Structural-associational solidarity, affectual solidarity, and intergenerational conflict.

3.3.1. Structural-associational solidarity

Queluz *et al.* (2022) used the Dyadic Relationship Scale, which includes a subscale of positive interaction, including items such as "I learned good things about him/her" and "communication between us has improved." The study by Aires *et al.* (2017) also explored the role of care behaviors in affecting the overload of caregivers, such as instrumental support (ADLS/IADLS), emotional support, financial support, keeping company, and visits.

3.3.2. Affectual solidarity

Two studies (Liu and Bern-Klug, 2016; Wu, Liu, Cao, *et al.*, 2021) used a single question in the CLHLS questionnaire to evaluate caregivers' perception of emotional closeness between adult children and older parents. In addition, Enright *et al.* (2020) used the Burns Relationship Satisfaction Scale (BRSS), which consists of 13 items that assess satisfaction in various areas of the relationship (i.e., handling finances and degree of affection and caring). The total scores are the sum of the items and range from 0 to 78, with higher scores indicating greater satisfaction. In addition, in the study by Lin *et al.* (2012), adult children's satisfaction with their intergenerational relationship was determined by assessing how they felt regarding two items: "I get along well with my parent" and "I am satisfied with the relationship with my parent."

3.3.3. Intergenerational conflict

In this review, we found that researchers measured the extent of intergenerational conflict from both the adult-child and parental perspectives. del-Pino-Casado *et al.* (2014) and Lopez-Anuarbe and Kohli (2019) both asked caregivers how they feel appreciation from their parents. In the study by Queluz *et al.* (2022), conflict was assessed by items such as “I felt depressed when I had problems with my relationship” and “I felt angry toward him/her.” Wu *et al.* (2021) also asked about caregivers’ willingness to provide care and divided the answer into willing to do versus without patience/need respite care/unwilling to do.

In summary, although intergenerational relationships are multidimensional and complex, by combining these eight studies, we found that tools for intergenerational relationships were based on two major dimensions, solidarity and conflict. In addition, comprehensive scales were used for measurement in some studies (Enright, O’Connell, Branger, *et al.*, 2020; Queluz, de Santis, de Fatima Kirchner, *et al.*, 2022).

3.4. The role of intergenerational relationships in affecting caregiver burden

We summarized the mechanisms of the role of intergenerational relationships in affecting caregiver burden through these eight studies and found that intergenerational relationships can be both stressors of burden and important psychosocial resources for caregivers.

3.4.1. Intergenerational relationships as a stressor of burden

First, with regard to structural-associational solidarity, Aires *et al.* (2017) found that involvements with ADLs and the provision of financial support were positively correlated with burden. Queluz *et al.* (2022) found that a positive interaction between the dyads was negatively correlated with burden. Second, concerning intergenerational conflict, the subjective burden was negatively associated with reciprocity and appreciation from older parents. When adult children receive more positive feedback but not negative emotions from their parents, they feel less burden (del-Pino-Casado, Millán-Cobo, Palomino-Moral, *et al.*, 2014; Lopez-Anuarbe and Kohli, 2019; Queluz, de Santis, de Fatima Kirchner, *et al.*, 2022). Third, we found some contradictory conclusions on how affectual solidarity influences caregiver burden. Liu and Bern-Klug (2016) found that an emotionally close relationship with the parent increased worries about performance, which means that adult children feel more worries and emotional burden when they have more affectual closeness with their parents. However, based on the same database as in Liu and Bern-Klug’s study, Wu *et al.* (2021) found that relationship closeness with the care recipient and willingness to provide care was not associated with burden. Last but not least, it deserves more attention that although most of the studies try to determine how intergenerational relationships affect caregiver burden, we found that some studies try to find a bidirectional relationship between intergenerational relationships and caregiver burden. For example, Queluz *et al.* (2022) found that not only were the positive interaction between the dyads and the presence of conflicts negatively and positively correlated with burden, respectively, but also that burden was predictive of a worse interaction between the dyad and of the presence of conflicts.

3.4.2. Intergenerational relationships as psychosocial resources for caregivers

In addition, researchers have also explored the impact of intergenerational relationships as a psychosocial resource for caregivers when faced with challenges and difficulties in caregiving. Lin *et al.* (2012) found that caregiver burden significantly improved caregiver depression and that intergenerational relationships moderated the effect of burden on depression. The relationship between caregiving burden and his or her level of depression was weaker when participants had a better parent-child relationships. Enright *et al.* (2020) explored the relationship among perceived identity change, intergenerational relationship quality, and caregiver burden using a mediation model. They found that relationship quality mediated the association between perceived identity change and caregiver burden. Caregiver-reported changes in the identity predicted significantly led to a decrease in relationship quality, which predicted increases in caregiver burden levels.

In summary, the mechanisms by which intergenerational relationships impact adult children’s caregiving burden remain unclear and need further exploration through more comprehensively designed empirical research.

4. Discussion

To the best of our knowledge, this systematic review is the first attempt to compare the effects of intergenerational relationships on caregiver burden across studies focusing on family caregivers of older adults. Some studies have pointed

out a significantly positive relationship between intergenerational relationships and caregiver burden. However, some studies reported a negative association between intergenerational relationships and caregiver burden. In addition, some studies have found mediating and moderating roles of intergenerational relationships in the stress process. Several aspects relevant to the findings need to be discussed to facilitate interpretation.

4.1. Measurement of intergenerational relationships

In terms of measurement, the majority of the existing papers adopt well-established scales to measure caregiver burden. However, when measuring intergenerational relationships, only a few studies adopt scales (Enright, O'Connell, Branger, *et al.*, 2020; Queluz, de Santis, de Fatima Kirchner, *et al.*, 2022). Scales to measure caregiver burden included the ZBI, the BAS, the CBI, and the CSI. Intergenerational relationships are a multidimensional concept relative to concepts such as attachment, emotional exchange, emotional support, intimacy, love, mutuality, reciprocity, and so on (Solomon, Hansen, Baggs, *et al.*, 2015). However, the majority of these eight studies did not adopt well-established scales to measure intergenerational relationships. Based on previous findings, we found that current measurements of intergenerational relationships can be divided into the following three main categories: Structural-associational solidarity, affectual solidarity, and intergenerational conflict. Therefore, we believe that in subsequent studies, reliable and valid scales should be used to measure intergenerational relationships to gain a more comprehensive understanding. Several scales have been used to measure relationships, such as the Burns Relationship Satisfaction Scale (Burns, Sayers, and Moras, 1994; Heyman, Sayers, and Sayers, 1994) and the Dyadic Relationship Scale (Sebern and Whitlatch, 2007). However, it is worth noting that not only adult children can be primary caregivers of older adults but also spouses, other relatives, or even friends. Therefore, we suggest that a reliable and valid relationship scale specifically for child-parent care dyads is necessary. For example, Bai (2018) developed and validated an Intergenerational Relationship Quality Scale for Aging Chinese Parents based on solidarity, conflict, and ambivalence models, which enables researchers and service practitioners to accurately measure the relationship quality between older people and their adult children.

4.2. Impact of intergenerational relationships on caregiver burden

Some studies pointed out a significantly positive relationship between intergenerational relationships and caregiver burden. For example, when adult children give parents more support or feel closer to them, they report more burden (Aires, Mocellin, Fengler, *et al.*, 2017; Liu and Bern-Klug, 2016). However, some studies have pointed out the significantly negative effect of intergenerational relationships on caregiver burden. For example, when adult children gain more positive feedback and more positive interactions from their parents, they report less burden (del-Pino-Casado, Millán-Cobo, Palomino-Moral, *et al.*, 2014; Lopez-Anuarbe and Kohli, 2019; Queluz, de Santis, de Fatima Kirchner, *et al.*, 2022). In addition, a not-significant association between intergenerational relationships and caregiver burden was found in one study (Wu, Liu, Cao, *et al.*, 2021). Some researchers have pointed out the importance of intergenerational relationships as a psychological resource for caregivers. A good intergenerational relationship can mitigate the effects of depression on caregiver burden (Lin, Chen, and Li, 2012) and can be a protective factor when facing complex caregiving difficulties (Enright, O'Connell, Branger, *et al.*, 2020). There are two probable reasons why the conclusions vary among studies. On the one hand, as stated above, due to the lack of an accurate operational definition of intergenerational relationships, it cannot be determined whether these inconsistencies in results arise from methodological issues or reflect a weak overall effect of intergenerational relationships on caregiver burden. On the other hand, various cultural contexts can result in different conclusions. These eight studies were based on data from Asia, Europe, North America, and South America. People's understanding and social norms about the parent-child relationships may differ greatly from culture to culture. For example, compared to Western culture, filial piety serves as a core familial norm in the Chinese social value system, which claims that children should provide their older parents with a broad range of support and care (Ikels, 2004). Thus, the impact of intergenerational relationships on caregiver burden in different cultural contexts may be different and deserves more exploration in future studies.

4.3. Pearlin's stress process model

The majority of studies in this review were not based on a well-established conceptual framework. However, the Pearlin's Stress Process Model (Pearlin, 1999; Pearlin, Lieberman, Menaghan, *et al.*, 1981; Pearlin, Mullan, Semple, *et al.*, 1990) is one of the most commonly used frameworks to explain the variation in caregiver health outcomes, including caregiver burden in long-term care studies. In addition, Pearlin *et al.* (1990) pointed out two important concepts relative to intergenerational relationships in this model, that is, family conflict and social support.

First, the Pearlin's Stress Process Model in 1981 reshaped the sociological study of stress and mental health by emphasizing the role of chronic stressors and resources on psychological distress. Pearlin *et al.* (1981) pointed out that disruptive life events might lead to some chronic stressors, such as family conflict. Family conflict might lead to mental health outcomes, such as burden. In addition, Pearlin *et al.* (1981) hypothesized that social support might inhibit or buffer the effects of stressors on mental health. That is, social support may be either a mediator or moderator in the relationship between stressors and burden. Second, following his seminal publication in 1981, Pearlin's Stress Process Model in 1990 was applied in the caregiving context. In this updated model, Pearlin *et al.* (1990) pointed out that family conflict might be a kind of secondary stressor and that social support is an important mediator for individuals, without explaining this mediating mechanism clearly. However, Pearlin's Stress Process Model in 1999 named social support as "moderating resources" rather than "mediating resources," which is quite different from the version in 1990. Pearlin (1999) pointed out that social support may reduce or contain the intensity of a stressor, inhibit the emergence of secondary stressors, and cushion the effect of the stressors on outcomes. In summary, Pearlin *et al.* held the view that family conflict is a stressor for caregiver burden. However, it's difficult to find a clear way with social support in influencing caregiver burden in his models. Does social support mediate the relationship between social context, stressors, and stress outcomes? Or does social support moderate the effect of stressors on stress outcomes? In our review of empirical studies, we also found the same puzzle that the role of intergenerational relationships on caregiver burden was inconclusive.

4.4. Limitations

The findings of this systematic review should be interpreted with caution due to several limitations. First, considering that demographics are highly related to intergenerational relationships and could drastically change over decades, the searches of the articles were limited to three databases (Web of Science, Scopus, and PsycINFO) over a specific period (2012 – 2022) to obtain the most recent studies. Therefore, future studies can extend the period or databases to obtain more relevant literature. Second, to accomplish our research aim, this review included only quantitative studies, and all the studies had cross-sectional designs. We think that it would be interesting for future studies to include different study designs, such as qualitative studies, randomized controlled trials, case-control studies, and so on, which will help facilitate a better understanding of the complex relationship between intergenerational relationships and caregiver burden.

5. Conclusions

Overall, this systematic review has contributed to the understanding of the relationship between intergenerational relationships and caregiver burden over the past decade. First, measurements of intergenerational relationships have not been clarified, and we suggested that reliable and valid scales should be used to measure intergenerational relationships to gain a more comprehensive understanding. Second, the relationship between intergenerational relationships and caregiver burden shows complexity and great variation; intergenerational relationships can directly alleviate or exacerbate caregiver burden, or they can be important psychological resources. Finally, we suggested that future studies could pay more attention to theories and use some theoretical frameworks to help explain the variation in caregiver health outcomes, such as the Pearlin's Stress Process Model. In conclusion, this systematic review shows that further examining the impact of intergenerational relationships on caregiver burden is an indispensable prerequisite for interventions that could positively influence the health outcomes of caregivers. For this purpose, more studies are needed to deepen the understanding of the different aspects of intergenerational relationships and caregiver burden.

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Conflicts of Interest

The authors declared no potential conflicts of interest with respect to research, authorship, and/or publication of this article.

Authors' Contributions

Ke X. and Fu Y. worked together to make substantial contributions to the conceptualization and design of the study, analysis of the data, drafting the manuscript, and revising the manuscript.

Ethics Statement

This study did not involve human subjects. The human data in this study are secondary data from the previous studies in public databases.

Availability of Supporting Data

All data are secondary data from publicly available data sources.

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