REVIEW

Grandparenting, health, and well-being: a systematic literature review

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Abstract
Whether grandparenting is associated with improved health or well-being among older adults is a salient question in present-day aging societies. This systematic review compiles studies that consider the health or well-being outcomes of grandparenting, concerning (1) custodial grandparent families, where grandparents are raising grandchildren without parental presence; (2) three-generation households, where grandparents are living with adult children and grandchildren; and (3) non-coresiding grandparents, who are involved in the lives of their grandchildren. Review was based on literature searches conducted in September 2019 via Web of Science, PubMed, PsycINFO, and Ebsco. We screened 3868 abstracts across four databases, and by following the PRISMA guidelines, we identified 92 relevant articles (117 studies) that were published between 1978 and 2019. In 68% of cases, custodial grandparenting was associated with decreased health or well-being of grandparents. The few studies considering the health or well-being of grandparents living in three-generation households provided mixed findings (39% positive; 39% negative). Finally, in 69% of cases, involvement of non-coresiding grandparents was associated with improved grandparental outcomes; however, there was only limited support for the prediction that involved grandparenting being causally associated with grandparental health or well-being. Despite this, after different robustness checks (counting all nonsignificant results, taking into account the representativeness of the data and causal methodology), the main finding remains the same: the most negative results are found among custodial grandparents and three-generation households and most positive results among non-coresiding grandparents.

Keywords Custodial grandparents · Grandchild care · Grandparental health · Intergenerational relationships · Three-generation households

Background and objectives

Due to increased life expectancy, the proportion of older adults, including grandparents, has increased on a global scale, and in fact, it has been estimated that currently approximately 13% (one billion) of world population are grandparents (Moore and Rosenthal 2016). Most grandparents play an active role in the lives of their grandchildren. In Europe, for instance, 58% of grandmothers and 49% of grandfathers provide regular grandchild care (Hank and Buber 2009), while approximately 2% of children are raised by their grandparents in the USA meaning that one million grandparents in the USA are the primary caregivers for their grandchildren (Dunifon et al. 2014). Thus, grandparents are often highly involved in their grandchildren’s lives and whether grandparenting provides benefits or disadvantages for grandparents in terms of their health or overall well-being is a salient question.

Many studies that attempt to detect whether grandparenting is associated with improved health or well-being predict that grandparents benefit from being involved in their grandchildren’s lives (e.g., Mahne and Huxhold 2015; Tsai et al. 2013). A counterhypothesis, however, takes the stance that caring for young children is challenging, particularly for older adults with limited reserves of strength (e.g., Baker and
Silverstein (2008a, b; Hughes et al. 2007). According to this perspective, active grandparenting could overburden older adults and lead to grandparents’ decreased health and well-being. For example, Coall and Hertwig (2010, 2011) argue that the association between grandparenting and grandparents’ health may result in an inverted U-shaped curve. Based on the Coall–Hertwig hypothesis, moderate grandparental involvement is the most beneficial for grandparents, while negative effects may arise when no grandparental involvement occurs or when it reaches the highest level of involvement (e.g., when grandparents are the primary caregivers of their grandchildren).

Thus, whether grandparenting improves the health or well-being of grandparents may depend on living arrangements that are related to the degree of grandparental involvement, which is why grandparents are commonly separated into three groups: (1) custodial grandparents, (2) grandparents living with their children and grandchildren in three-generation households, and (3) non-coresiding grandparents (i.e., those involved in their grandchildren’s lives without living with them). In households where the grandparents are the primary caregivers of their grandchildren or they live with their descendants in a three-generation household, the high level of their involvement is assumed based on the living arrangements. Among non-coresiding grandparents, however, grandparental involvement is most often measured via childcare support but also the frequency of contact, emotional closeness, and other informal assistance.

Cultural variation in living arrangements, filial norms, and grandparental involvement are substantial (Shwalb and Hossain 2017). Living in three-generation families or being a custodial grandparent is much more common in many Asian countries than in Western ones. This variation has been partly explained by the influence of Confucianism, which promotes a tradition of filial responsibility (Burr and Mutchler 1999; Speare and Avery 1993). Also reciprocity may be an important factor in Asian countries with strong filial obligations (e.g., Sheng and Settles 2006). Cultural traditions could also influence whether custodial grandparenting or living in three-generation household is associated with positive or negative outcomes among grandparents because in Asian countries grandparents living with grandchildren are not as selected group as they are in Western countries. In addition, due to the lack of publicly provided old age support grandparents need to rely on their children and thus living with them or with grandchildren could provide benefits to grandparents themselves. The expectation is, that the negative effects of highly involved grandparenting observed in Western countries are not present or could be even positive in Asian countries.

This review makes a novel contribution to the literature by compiling research on all three contexts of grandparenting and revealing how in each context the involved grandparenting is associated with grandparental health or well-being. Cultural context of grandparenting is taken into account as the review observes also the distribution of studies and results by various countries. In addition, the review investigates whether previous studies have provided convincing causal evidence for the possible association.

**Aim of the review: to reveal a grandparenting effect**

Our main aim is to investigate whether grandparenting (or grandparental involvement) is associated with the health or well-being of grandparents and whether this association is positive or negative. Grandparent outcomes have been measured with several variables which we can summarize into two rough categories: health and well-being. The health category includes, for instance, longevity, cognitive skills, mental health, depressive symptoms, stress levels, physical health, frailty index, self-rated health, preventive health behavior, and limitations in activities of daily living. Well-being category in turn includes variables such as happiness, life satisfaction, subjective well-being (SWB), and perceived quality of life. Of course, these broad categories are not mutually exclusive but rather interrelated. Being in good health is probably associated with increased well-being and vice versa. Studies detecting the effect of grandparental involvement on grandparent outcomes have commonly used one or several of these outcomes and to be as comprehensive as possible, we try to take all such studies into account.

Three contexts of grandparenting (i.e., custodial grandparents, grandparents in three-generation households, and non-coresiding grandparents) have been considered, respectively. In addition, the geographic and cultural context of grandparenting has been observed. As we conducted a database of studies included in the review, we marked each study’s result as being either positive, negative, or nonsignificant, depending on the association and its statistical significance between grandparents’ involvement and their health or well-being. Some studies that included more than one context of grandparenting may have been marked as providing nonsignificant results in one context (e.g., custodial grandparents) but positive results in another (e.g., non-coresiding grandparents; Choi and Zhang 2018). Likewise, some studies may provide negative results in one context and positive results in another (e.g., Hughes et al. 2007).

In several cases, more than one health or well-being outcome was investigated in a single study. We marked the result of a study as being either positive or negative, even if there was one positive or negative association revealed, and we marked a study as being both positive and negative if it contained both results. The latter was often the case if the results were separated according to gender (e.g., Hughes et al. 2007) or ethnicity (e.g., Goodman and Silverstein 2002, 2006). Also, a study was marked as nonsignificant if all the
results in specific grandparent groups showed nonsignificant associations (e.g., Ates 2017; Hsu and Chang 2015). Thus, the total number of positive, negative, or negligible results exceeded the number of studies included in the review (see Table 2). However, in the review, we also counted the total number of all the results in the studies, which was substantially higher than counting only the positive, negative, and nonsignificant results overall, as one study may have several positive, negative, or nonsignificant results due to multiple outcome measures and separations (see Table 4).

Research design and methods

Search strategy

On September 27, 2019, we conducted a systematic literature search in three databases: Web of Science, PubMed, and PsycINFO. Then, on September 30, 2019, we included one more database, Ebsco, in the review process. We limited the search to peer-reviewed articles in English that employed a quantitative method and were published between 1970 and 2019. In practice, the first study in our sample is from 1978 (Wood and Robertson 1978) because before this there were none eligible studies.

Our search words included the following familial circumstances or terms related to grandparenting: intergeneration*; multigeneration*; “custodial grandparent*”; three-generation*; “skipped generation*”; grandchild*; “extended family*”; “extended household*”; alloparent*; “co residence”; co-residence, coresidence, grandparent*; grandmother*; grandfather*; grandmaternal*; and grandpaternal*. We also included search words related to grandparental investment, health or well-being: care; “primary care*”; cognition*; “mental health”; depression, depressive; “physical health”; “self-rated health”; “self-rated health”; “activities of daily living”; ADL; happiness; and “life satisfaction.”

Screening eligibility and inclusion criteria

The review’s search yielded 19,246 records in total, but we excluded the following articles: duplicates (n = 8189), those that covered other topics based on the article’s name (n = 7030), those that were not scientific or peer-reviewed (n = 99), and those that were in other languages besides English (n = 60). Thus, we included 3868 abstracts for screening, and afterward, we excluded articles that did not concern grandparenting (n = 2735) or include indicators about grandparental health or well-being (n = 465). We also excluded those that were not peer-reviewed (n = 217), only employed qualitative methods (n = 68), were in other languages besides English (n = 60), were reviews (n = 15), and those specifically concerned with being/becoming a grandparent (n = 8) (Fig. 1).

We assessed the full text for 300 articles, excluding those that were not based on quantitative research (n = 39), did not have grandparental investment as an independent variable (n = 38), included no grandparental health or well-being outcomes (n = 15), and those that only generally covered caregivers but did not distinguish between grandparents and other types of caregivers (n = 7). Finally, we excluded studies that only concerned custodial grandparents (n = 99) or only three-generational households (n = 9) if they did not include a comparison group of either non-custodial or non-coresiding grandparent populations. The exceptions included studies that compared grandparents’ health or well-being before and after they were custodial grandparents or before and after they began living in three-generational households. Finally, one study could not be accessed, and based on the abstract, we were unable to evaluate whether it should have been included in the review (Minkler and Fuller-Thomson 2001).

Based on these selections, a total of 92 articles (i.e., peer-reviewed, published research reports) were included in the final sample. We classified all the studies (i.e., part of an article that covers one of the abovementioned types of familial circumstances) based on whether they concerned custodial grandparents (n = 34), three-generational households (n = 18), or non-coresiding grandparents (n = 65). Some articles covered more than one type of family circumstance; thus, the total number of studies included was higher (n = 117) than the number of articles in the final database. In this paper, the term, result, refers to a single finding that concerns grandparental involvement and an outcome measure (whether article had at least one positive and/or negative or negligible result n = 141; all results n = 452). In this sense, an article can contain a maximum of three studies, while a single study can contain several results.

Results

Descriptive findings

The populations that were studied in the review are shown in Table 1. Most research was conducted with data from the USA (n = 48), especially in the custodial grandparent group. Also, many studies, especially in the non-coresiding grandparent group, were conducted with data from European countries (n = 21), and of these, a significant number utilized data from multiple European countries by using the Survey of Health, Ageing and Retirement in Europe (SHARE) data (n = 12). However, studies using data from European countries are missing from the custodial grandparent group, which is likely because the number of custodial grandparent
households is much lower in Europe (particularly Western Europe) than in the USA or Asian countries (Shwalb and Hossain 2017). In addition, there were 29 studies utilizing data from Asian countries, 7 studies from Australia, 2 from South America, and 10 from other countries (4 from Turkey, 4 from Kenya and 2 from Israel).

Custodial grandparents

Custodial grandparents are the primary caregivers for their grandchildren, and recently, the number of these “skipped-generation households,” or “grandfamilies,” has increased in many Western countries. Currently, this population group is highest in the USA, where approximately 2% of children are raised by their grandparents (Dunifon et al. 2014). While grandparents may be responsible for raising their grandchildren for many reasons, among the most common in Western countries are parental teenage pregnancy, drug addiction, mental/physical health problems, incarceration, distance employment, relationship breakdown, and death (Hayslip et al. 2017). In Asian countries, however, grandparents mostly raise their grandchildren due to distance
employment, especially in China, where parents often leave their children with their parents due to temporary migration, which refers to working in other locations (Chen and Liu 2012; Cong and Silverstein 2008).

In the review, a total of 68% (23/34) of the custodial grandparent studies were conducted with data from the USA (Table 1 and Appendix Table 6). According to the research describing custodial grandparents’ characteristics in the USA, they are more often concerned with women than men, and more often, they focus on the maternal side (Dunifon et al. 2014; Hayslip et al. 2017). In most cases, custodial grandparents in the USA are members of lower socioeconomic classes, single women (Fuller-Thomson et al. 1997; Heywood 1999; Minkler and Fuller-Thomson 2000), African-Americans, and between ages 50 and 59, whereas only very few are under 40 or over 80 (Ellis and Simmons 2014).

Thus, in the USA, custodial grandparent families are predominantly a selected group, which inevitably affects any comparison between custodial grandparents and non-custodial grandparents. According to the studies in this review, grandparents raising grandchildren have a higher risk of various health problems. Among 68% (30/44) of the results, the health or well-being of custodial grandparents was, at least in some grandparent subpopulations, poorer than non-custodial grandparents, their counterparts (Table 2 and Appendix Table 6). For instance, custodial grandparents have a higher risk of being limited in their daily activities as well as having depressive symptoms, elevated stress levels, and poorer self-rated health than their counterparts (e.g., Baker and Silverstein 2008a; Blustein et al. 2004; Minkler and Fuller-Thomson 1999, 2005; Musil et al. 2011). Most studies in this group have used measurements related to grandparental health but also some used measurements related to well-being (e.g., life satisfaction, quality of life) and also these revealed mostly negative associations (Bowles and Myers 1999; Wilmoth et al. 2018; Yalcin et al. 2018).

Many of the detrimental effects on grandparents’ health or well-being in skipped-generation households are likely due to their characteristics and history rather than their caring responsibilities exclusively.

Although many studies on custodial grandparents have been conducted with cross-sectional data and could reveal selection effects, numerous investigations also contain longitudinal data (n = 16 studies, n = 21 results; Table 3). In these studies, a negative association is also apparent, as a grandparent who begins raising a grandchild often suffers from a decline in health (e.g., Baker and Silverstein 2008a, b; Musil et al. 2011). Thus, it might not only be selection that explains the negative association between custodial grandparenting and grandparental health.

Among the results, only 27% (12/44) showed positive outcomes for custodial grandparents (Table 2 and Appendix Table 6). Twelve studies report at least one positive result between being a custodial grandparent and grandparental health, including those from the USA (7), South Korea (1), Taiwan (1), Kenya (2), and Thailand (1). Most of these

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**Table 1** Number of studies by study population and family circumstances, total 117

| Population  | Grandparent type | Total |
|-------------|------------------|-------|
|             | Custodial        | Three-generation | Non-coresiding |       |
| USA         | 23               | 10      | 15           | 48    |
| Finland     | 0                | 0       | 1            | 1     |
| Sweden      | 0                | 0       | 1            | 1     |
| Germany     | 0                | 0       | 4            | 4     |
| Ireland     | 0                | 0       | 2            | 2     |
| Spain       | 0                | 0       | 1            | 1     |
| Europe      | 0                | 0       | 12           | 12    |
| China       | 1                | 2       | 5            | 8     |
| South Korea | 2                | 1       | 6            | 9     |
| Taiwan      | 1                | 4       | 5            | 10    |
| Thailand    | 1                | 0       | 1            | 2     |
| Australia   | 1                | 0       | 6            | 7     |
| Chile       | 0                | 0       | 1            | 1     |
| Mexico      | 0                | 0       | 1            | 1     |
| Israel      | 0                | 0       | 2            | 2     |
| Kenya       | 4                | 0       | 0            | 4     |
| Turkey      | 1                | 1       | 2            | 4     |
| Total       | 34               | 18      | 65           | 117   |

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**Table 2** Summary of associations in grandparent groups: custodial, three-generation households, and non-coresiding

|                | Positive association | Negative association | No association | Total no. of studies | Total no. of results |
|----------------|----------------------|----------------------|----------------|----------------------|---------------------|
| Custodial care | 12 (27%)             | 30 (68%)             | 2 (5%)         | 34                   | 44                  |
| Three-generation | 9 (39%)             | 9 (39%)             | 5 (22%)       | 18                   | 23                  |
| Non-coresiding | 51 (69%)             | 14 (19%)             | 9 (14%)       | 65                   | 74                  |
| Total          | 72 (51%)             | 53 (38%)             | 16 (11%)      | 117                  | 141                 |

Number of results and % of total number of results
studies, however, also report some negative results regarding an outcome or grandparent group (Appendix Table 6), and importantly, only two studies report solely positive results (Chung and Park 2018; Ku et al. 2013).

Within this category about half of the studies were conducted with representative data (47%, 16/34) and half with non-representative data (53%, 18/34). Among positive results 50% (6/12), the data used were representative and among negative results 41% (13/32).

In summary, there are two options for interpreting the results, which showed that, in most cases, custodial grandparents reported poorer health when compared to their non-custodial counterparts. The first option is that a decline in health occurs when one enters the role of a custodial grandparent since it increases the burden of caregiving. However, one study shows that grandmothers, who had been raising and continued to raise their grandchild, were more likely to have preventive health behaviors (Baker and Silverstein 2008b), meaning that the health decline may not be considered long-lasting. The second option is that these findings are based on selection effects, and custodial grandparents—especially in Western societies—are typically considered part of a disadvantaged group. In Asian countries, however, custodial grandparents do not constitute a disadvantaged group, so the results may differ. In this review, 5/34 studies concerning custodial grandparents were conducted with data from Asian countries, and the results were either nonsignificant (Chen and Liu 2012; Choi and Zhang 2018), positive (Chung and Park 2018; Ku et al. 2013), or both positive and negative (Komonpaisarn and Loichinger 2019).

**Grandparents in three-generation households**

The terms, “three-generation” and “multigenerational” families, refer to a living arrangement whereby children, parents, and grandparents live together in the same household. The number of three-generation households varies remarkably between countries. For instance, approximately 25% (or more) of adolescents in Southern European countries live in three-generation households, whereas the number of children living in multigenerational households is less than 5% in Scandinavian countries (Kreidl and Hubatkova 2014). Meanwhile, by age five, almost a fourth of children in the USA live in three-generation families, while 8% and 11% do so in the UK and Australia, respectively (Pilkauskas and Martinson 2014).

Few investigations examine whether living in three-generation households is associated with improved or impaired outcomes among grandparents, (Dunifon et al. 2014) and, similar to custodial grandparenting, this population group is primarily studied in the USA (Dunifon et al. 2016). In our review, 56% (10/18) of the studies were conducted with US data, while 39% (7/18) was data from Asian countries and one study included data from Turkey.

Based on the results, living in a three-generation household is as likely to be beneficial as detrimental for grandparents. Of the results, 39% (9/23) showed a positive association, but 39% (9/23) also showed a negative association. Meanwhile, 22% (5/23) of the results showed a nonsignificant association (Table 2 and Appendix Table 7). Many of the articles examining grandparents’ health or well-being while living in three-generational households also consider custodial grandparents, so in these cases, comparisons are often made between these two groups (e.g., Blustein et al. 2004; Goodman and Silverstein 2002; 2006). The outcome measures that were utilized include, for instance, the following that can be counted as health measurements: depressive symptoms, self-rated health, functional/mobility limitations, and different stress factors and the following that can be counted as well-being measurements: happiness, quality of life, and life satisfaction (e.g., Tsai et al. 2013; Musil and Ahmad 2002; Ku et al. 2013; Hsu and Chang 2015; Goodman 2003; Yalcin et al. 2018).

Like the results concerning custodial grandparents, those involving grandparents in three-generation households may reflect the selection effect, meaning that grandparents living in three-generation households may already have poorer health than those in different living arrangements (Hughes et al. 2007). However, studies with longitudinal data (n = 11 studies, n = 13 results; Table 3) indicate that negative (e.g., Chen and Liu 2012; Hughes et al. 2007; Musil 2000) and positive (Tsai et al. 2013; Musil et al. 2011; Hughes et al. 2007) associations exist, even when the health or well-being of a grandparent is measured over time. Positive and negative results were found in studies that were conducted with data from both the USA and Asia (e.g.,

| Table 3 Summary of associations in custodial, three-generation, and non-coresiding grandparent groups with longitudinal data and/or causal modeling |
|---------------------------------|----------------|----------------|----------------|----------------|----------------|
| Positive association | Negative association | No association | Total no. of studies | Total no. of results |
| Custodial care | 7 (33%) | 12 (57%) | 2 (10%) | 16 | 21 |
| Three-generation | 4 (31%) | 6 (46%) | 3 (23%) | 11 | 13 |
| Non-coresiding | 26 (72%) | 6 (17%) | 4 (11%) | 32 | 36 |
| Total | 37 (43%) | 24 (34%) | 9 (13%) | 59 | 70 |

Number of results and % of total number of results.
Chen et al. 2015; Chen and Liu 2012; Hughes et al. 2007; Tsai et al. 2013). Thus, the positive/negative results were not solely related to the country of residence; however, the results that were solely positive were more often found in studies with data from Asian countries (Guo et al. 2008; Ku et al. 2013; Tsai et al. 2013). Among three-generation household studies, 44% of them were conducted with representative data (8/18) and 56% with non-representative data (10/18). Among positive results 33% (3/9), among negative results 33% (3/9), and among nonsignificant results 60% (3/5), the data used were representative.

**Grandparents living separately from their grandchildren**

The largest group of caregiving grandparents, particularly in Western countries, includes those who do not live with their grandchildren but provide them with different kinds of support relatively frequently. In recent decades, an increasing number of studies have investigated the associations between active grandparenting and the health and well-being of noncoresiding grandparents. Most studies that focus on noncoresiding grandparents are conducted with European data (32%; 21/65), and over half of these (12 studies) contain data from multiple European countries. Meanwhile, 26% of the studies (17/65) were conducted with data from Asian countries, 23% (15/65) utilized data from the USA, 9% (6/65) utilized data from Australia, and the remaining 9% (6/65) involved data from other countries (e.g., Israel or Turkey) (Table 1 and Appendix Table 8).

Non-coresiding grandparents are involved in the life of their grandchildren in many ways, and the most common measure of their involvement is grandparental childcare assistance (e.g., Ates 2017; Grundy et al. 2012; Xu et al. 2012). Grandparental involvement measures also include the frequency of contact between grandparent and grandchild (e.g., Bates and Taylor 2012, 2016; Danielsbacka and Tanskanen 2016; Garcia-Campos et al. 2010), financial help, and other informal forms of assistance or emotional support (e.g., Fujiwara and Lee 2008). Also, grandparental health has been measured with various variables, such as self-rated health (e.g., Choi and Zhang 2018; Danielsbacka et al. 2019), longevity and time to death (Hilbrand et al. 2017a; Hilbrand et al. 2017b), cognitive functioning (e.g., Ahn and Choi 2019; Arpino and Bordone 2014), depression and mental health (e.g., Lee et al. 2019; Xu 2019), and functional limitations/abilities (e.g., O’Loughlin et al. 2017; Ku et al. 2012). Grandparental well-being has been measured with variables such as subjective well-being (SWB), perceived quality of life, happiness, and life satisfaction (e.g., Arpino et al. 2018; Conde-Sala et al. 2017; Danielsbacka and Tanskanen 2016; Nimrod 2008). In many cases, several measurements from both groups (health and well-being) are utilized in the same study.

Among non-coresiding grandparents, most of the results were positive (69%; 51/74). Meanwhile, only 19% (14/74) reported a negative association between grandparental involvement and well-being, while 14% (9/74) showed a negligible association (Table 2 and Appendix Table 8). The positive results were found from the data of European countries (e.g., Arpino and Bordone 2014; Mahne and Huxhold 2015), Asian countries (e.g., Luo et al. 2019; Park 2018), the USA (e.g., Hughes et al. 2007; Xu et al. 2017), and other countries (e.g., Grundy et al. 2012; Thiele and Whelan 2008). Thus, the positive results were not solely restricted to certain geographic regions. Furthermore, they were found among studies that contained cross-sectional data (e.g., Conde-Sala et al. 2017), longitudinal data (e.g., Di Gessa et al. 2016a), and methods for detecting causal relations [e.g., the IV approach (Arpino and Bordone 2014) or panel fixed-effect models (Danielsbacka et al. 2019)]. Since most studies utilize grandparental childcare support as an independent variable, this is the most common explanatory variable among the studies with positive results. Grandparental health or well-being were measured with several outcome variables, and thus, the positive associations were not restricted to certain health or well-being outcomes.

The negative results were most commonly accompanied with positive results (n = 9), and in these cases, the negative associations only applied to a certain grandparent group or outcome. Results that were solely negative were only found in five studies, which included associations between grandfathers’ frequency of contact with a grandchild and decreased life satisfaction (Sener et al. 2008), a grandparent’s centrality role and decreased psychological well-being (Muller and Litwin 2011), and grandparental childcare and increased depressive symptoms (Brunello and Rocco 2019).

Only nonsignificant results were found most likely among the studies that were not specifically focused on associations between grandparental involvement and well-being but considered a wider range of social connections or caregiving roles (i.e., caring for grandchildren was one measurement among others) (Hsu and Chang 2015; Nimrod 2008; O’Loughlin et al. 2017; Ward et al. 2019; Young and Denson 2014).

Among non-coresiding grandparent studies data used was representative in 65% of the studies (42/65) and nonrepresentative in 35% of the studies (23/65). Among positive results 65% (33/51), among negative results 57% (8/14), and among nonsignificant results 67% (6/9), the data used were representative.
Discussion and implications

The present review includes articles that consider the associations between grandparenting and grandparents’ health or well-being. In 68% of cases, custodial grandparenting was associated with decreased health or well-being of grandparents. Studies considering grandparents’ health or well-being who live in three-generation households provided mixed results (39% positive; 39% negative). The involvement of non-coresiding grandparents was associated with improved grandparental outcomes in 69% of the results. Thus, the most negative results were present in the case of custodial grandparents, the most mixed results were among those that involved grandparents living in three-generation households, and most positive results concerned the case of non-coresiding grandparents (Table 2).

We also considered whether the results were based on representative rather than non-representative data. Non-representative data were most commonly used in studies focusing on non-coresiding grandparents (56%) whereas representative data were utilized mostly in studies of non-coresiding grandparents (65%). Among custodial grandparent studies, positive results were most commonly achieved with representative data (50, 6/12), in three-generation households representative data constituted 60% (3/5) of nonsignificant results and in non-coresiding grandparent group also nonsignificant results were most likely conducted with representative data (67%, 6/9). Two last mentioned proportions are from the category that had overall lowest number of results.

However, when we consider all the results that were included in the studies in this review, the overall proportion of positive, negative and nonsignificant results appear different (Table 4). As in many studies, several results were investigated that were either due to a differentiation in the grandparent subgroups (e.g., the grandparents according to gender) or multiple outcomes, so the same study may include several positive, negative, or negligible results. When all the results were considered (n = 452), the most common in every grandparent group was nonsignificant. In the case of custodial grandparents, 44% (67/151) of the results were nonsignificant, 62% (53/85) in the case of three-generation households, and 51% (111/216) for non-coresiding grandparents (Table 4). Although the number and proportion of nonsignificant results increased after all the results were counted, the proportion of negative results remains the highest among custodial grandparents (43%), while that of the positive results were those of the non-coresiding grandparents (36%). However, it is evident that after counting all the results that address the association between grandparental involvement and grandparental health or well-being, the overall evidence for significant results (either positive or negative) becomes weaker.

Furthermore, as previously discussed, the associations that were found may not be causal in nature, but rather, they may reflect the selection of different caregiving groups. To observe how well the abovementioned studies capture the causal nature of the associations, we have compiled a table of the results that are only based on longitudinal data and/or methods that can detect causality. The ones that are most commonly utilized include panel fixed-effect models and instrumental variable approaches (Table 3). Overall, approximately 50% (59/117) of studies utilized longitudinal data and/or causal methods, and based on these, the most negative results were still found among custodial grandparents (57%; 12/21) and the positive among non-coresiding grandparents (72%; 26/36). However, a more detailed investigation reveals that only approximately 20% (22/117) of studies’ methods can actually address the question of causality (Table 5). Still, based on these studies, the negative effects were most commonly found among custodial grandparents (50%; 3/6) and three-generation households (60%; 3/5), while positive effects were found among non-coresiding grandparents (50%; 6/12).

As was assumed, based on the hypothesis of Coall and Hertwig (2010, 2011), moderate grandparental involvement (e.g., that of non-coresiding grandparents) seems the most beneficial for grandparents, while negative effects were more common when grandparental involvement reached the highest level, like when grandparents became the primary caregivers for their grandchildren. However, as more detailed investigation has revealed, the most common result in all grandparenting contexts was nonsignificant. Also, although approximately half of the studies utilized longitudinal data,

Table 4  Summary of all associations in custodial, three-generation, and non-coresiding grandparent groups

|                      | Positive association | Negative association | No association | Total no. of studies | Total no. of results |
|----------------------|----------------------|----------------------|----------------|----------------------|----------------------|
| Custodial care       | 19 (13%)             | 65 (43%)             | 67 (44%)       | 34                   | 151                  |
| Three-generation     | 15 (18%)             | 17 (20%)             | 53 (62%)       | 18                   | 85                   |
| Non-coresiding       | 77 (36%)             | 28 (13%)             | 111 (51%)      | 65                   | 216                  |
| Total                | 111 (25%)            | 110 (24%)            | 231 (51%)      | 117                  | 452                  |

Number of results and % of total number of results...
only one-fifth of the methods that were used could detect causal relations. This reveals two important questions: First, since there was a large number of nonsignificant results, is the interpretation concerning the association of grandparenting with grandparental health and well-being robust? Second, is the association causal? The first question could indicate a publishing bias, meaning that nonsignificant results may remain unpublished unless they are accompanied by at least one significant result. However, after all our robustness checks (accounting all results, distributing results based on causal methods and representativeness of data) the main finding remains the same: the most negative results are found among custodial grandparents and most positive results among non-coresiding grandparents.

Negative results found among custodial grandparents and grandparents living in three-generation households may reflect selection effects (concerning poorer health), as previously discussed. However, we also found negative results in the longitudinal data that was conducted with methods able to detect causal associations. At least in some circumstances, therefore, the interpretation that becoming a custodial grandparent or living in a three-generation household is detrimental for grandparental health or well-being seems to be robust.

In the case of three-generation households, it is important to consider the reason behind these living arrangements, as grandparental co-residence could either be a result of their poor health (i.e., they need daily support) or stem from a need to take care of their grandchildren. For the former, grandparents may receive significant support from their adult children, which can improve their health and well-being, but they are in poor health to begin with. Regarding the latter, the grandparents are likely in reasonably satisfactory health to begin with but may become constant “nannies” for their grandchildren, causing extra strain that may have a negative health effect.

One of our aims was to investigate whether the results in three groups of grandparents would differ according to study population, i.e., whether they were dependent on cultural context. Our prediction was that being a custodial grandparent or living in three-generation household could be less detrimental or even positive for grandparents in Asian countries. However, the positive/negative results regarding custodial grandparents or three-generation households were not solely related to the country of residence, although the results that were solely positive were more often found in studies with data from Asian countries (Chung and Park 2018; Guo et al. 2008; Ku et al. 2013; Tsai et al. 2013). Regarding non-coresiding grandparents, the positive results in this group were also found from the data of European countries, Asian countries, the USA, and other countries meaning that the positive results were not solely restricted to certain geographic regions. To conclude, we did find some support for the prediction that living with grandchildren would have less detrimental effects for grandparents in Asian countries, but also that the distribution of positive and negative results did not follow strictly the geographic or cultural distinctions.

Although an extensive and increasing number of studies have investigated whether grandparenting is associated with the health or well-being of grandparents, some gaps still exist in the research. While studies with longitudinal data are well-represented, more studies are needed that analyze the causal nature of the associations. Furthermore, studies using longitudinal data (especially with several follow-ups), and even those with causal methods, cannot disregard that a health decline is inevitable among older adults. Thus, studies should concentrate on the relative health decline rather than health improvement (e.g., Chen and Liu 2012). Thus, a hypothesis may be that moderately involved grandparents would suffer from a slower health decline than their

|                        | Positive association | Negative association | No association | Total no. of studies | Total no. of results |
|------------------------|----------------------|----------------------|---------------|----------------------|---------------------|
| Custodial care          | 2 (33%)              | 3 (50%)              | 1 (17%)       | 5                    | 6                   |
| Three-generation        | 1 (20%)              | 3 (60%)              | 1 (20%)       | 5                    | 5                   |
| Non-coresiding          | 6 (50%)              | 2 (17%)              | 4 (33%)       | 12                   | 12                  |
| Total                   | 9 (39%)              | 8 (35%)              | 6 (26%)       | 22                   | 23                  |

Number of results and % of total number of results
counterparts. However, one problem with longitudinal designs is that they may suffer from selective attrition over time meaning that people who experience health decline drop out from the survey. Another relevant direction would include studies that use cross-sectional data and causal methods (e.g., instrumental variable approach), as they may capture the causal effect more accurately without involving the aging effect or selective attrition over time.

In several studies, grandparental outcomes have been separated by gender or ethnicity, so some additional segregation or interactions could be relevant. For instance, it is well-known that socioeconomic status is associated with health (e.g., Kim and Durden 2007), but few studies examine the interaction between socioeconomic status and grandparental involvement and its association with grandparental health or well-being (e.g., Chung and Park 2018; Mahne and Huxhold 2015). It is also well-known that lineage (i.e., whether a grandparent is from the maternal or paternal side) is strongly associated with grandparental childcare and being a custodial or coresiding grandparent (Tanskanen and Danielsbacka 2019). Still, surprisingly few studies consider this while studying the association between involved grandparenting and grandparental health or well-being (e.g., Danielsbacka and Tanskanen 2016). Number of grandchildren varies a lot across studies and also depends on the context of grandparenting. Custodial grandparents and grandparents living in three-generation household are commonly involved with grandchildren of one of their child whereas non-coresiding grandparents can be involved with grandchildren via several adult children. Not only the intensity of grandchild care but also the number of grandchildren to be cared for may affect grandparental outcomes. Thus, the number of grandchildren, especially the number of grandchildren via different children, is relevant factor to be considered in future studies.

Moreover, in the case of non-coresiding grandparents, the most common measure for grandparental involvement is childcare that is provided by grandparents. Looking after grandchildren without a parental presence may not capture all the positive aspects of being an involved grandparent. Thus, contact frequency or emotional closeness with grandchildren could be a more relevant measurement to understand the association between involved grandparenting and grandparental health or well-being. In addition, we have concentrated on studies that use the intensity of grandparental involvement as an explanatory variable but there are also other ways to compare grandparent types in respect to their health or well-being. For instance, the different styles of grandparenting (e.g., Neugarten and Weinstein 1964; Cherlin and Furstenberg 1985), different levels of reserves and strengths, or different role identities (e.g., Drew and Silverstein 2004) could lead different outcomes measured as grandparent health or well-being indicators.

The impact of grandparental involvement on grandparental health or well-being has been measured with varying measurements across the studies included in this review. This could be regarded as a limitation because the effects might differ regarding different outcomes. However, we did not find any clear biases on whether the associations would have been positive, negative, or negligible according to health or well-being measure used. This indicates that grandparental involvement may be similarly associated with various measures of health and well-being.

The question of how to increase the healthy years of one’s life is crucial in contemporary aging societies, so whether time spent with grandchildren could promote health or well-being remains relevant. Policy implications concerning this review’s findings are threefold. First, grandparents in custodial circumstances and three-generational households are the most vulnerable grandparent group, which policymakers should recognize. For them, caring responsibilities are not beneficial (although they are not solely detrimental either). Moreover, based on scant causal evidence, negative associations are not merely due to selection, which means that becoming or continuing a custodial/coresiding role as a grandparent could deteriorate health and well-being. However, especially in the case of these grandparent groups, cultural differences do exist and thus it is important to take into account the study population when the results are considered.

Moreover, among non-coresiding grandparents, their involvement is associated with improved health and well-being, although this association is not unequivocal. Despite the paucity of strong causal evidence, moderate grandparental involvement of non-coresiding grandparents should still be encouraged and enabled in terms of social policy decisions. Finally, we need more studies that can detect the causal nature of this association, as the lack of causal evidence concerns all three contexts of grandparenting.

Appendix

See Tables 6, 7 and 8.
| References                  | Population | Sample characteristics | Measure of grandparent's health/well-being | Association |
|-----------------------------|------------|------------------------|------------------------------------------|-------------|
| Baker and Silverstein (2008a) | USA        | 8468; 52–74 years old; representative | Depressive symptoms                      | neg         |
| Baker and Silverstein (2008b) | USA        | 5298 grandmothers; 50–70 years old; representative | Preventive health behavior                 | neg. (gms who recently began raising gc, less likely preventive health behav) & pos. (gms who had been raising and continue to raise gc, more likely preventive health behav) |
| Bigbee et al. (2011)        | USA        | 485 grandmothers (rural–urban); non-representative | Physical and mental health                 | neg. (for rural gms in case of mental health) |
| Blustein et al. (2004)      | USA        | 10,293 grandparents; 53–63 years old; representative | Depressive symptoms                       | neg         |
| Bowers and Myers (1999)     | USA        | 101 grandmothers (23 custodial, 33 part-time carers, 45 regularly visiting grandchildren); non-representative | Burden, parenting stress, grandparenting satisfaction, life satisfaction | neg         |
| Chen et al. (2015)          | USA        | 69,668; 50+ years old; representative | Frailty index (FI)                        | neg         |
| Chen and Liu (2012)         | China      | 14,954 person-year records; 55 and above; non-representative | Self-rated health (SRH)                   | ns          |
| Choi and Zhang (2018)       | South Korea| 3092 grandmothers; 45 and above; representative | Self-rated health                          | ns          |
| Chung and Park (2018)       | South Korea| 1948 grandmothers; 50–74 years old (in 2006); representative | Developmental trajectories of depressive symptoms and self-rated health over time | pos. (more depressive symptoms if stopped raising gc in low-income group) |
| Dunne and Kettler (2008)    | Australia  | 52 caregiving and 45 non-caregiving grandparents (age-matched sample); non-representative | Stress, anxiety and depression scores     | neg         |
| Fuller-Thomson and Minkler (2000) | USA | 79 African American grandparents who were raising a grandchild and 485 African American grandparents who had never been primary caregivers for a grandchild; non-representative | Depression (CES-D), activities of daily living | neg         |
| Fuller-Thomson and Minkler (2005) | USA | 319 American Indian or Alaska Native grandparent caregivers and 5956 AI/AN who reported that they were not caregivers to grandchildren; 45 years old and older; representative | Limitations in activities of daily living, functional disability, severe vision or hearing problem, poverty line status | neg         |
| Goodman and Silverstein (2002) | USA | 1058 grandmothers; non-representative | Grandmothers' well-being (negative affect, positive affect, life satisfaction, depression, and mental health) | neg. (Latino), pos. (African American), ns. (White) |
| Goodman and Silverstein (2006) | USA | 1051 grandmothers; non-representative | Grandmothers' well-being (negative affect, positive affect, life satisfaction, and depression) | neg. (Latino), pos. (African American), ns. (White) |
| Hayslip et al. (1998)       | USA        | 193 grandparents; non-representative | Psychosocial satisfaction and positive grandparental meaning | neg. (psychosocial satisfaction), pos. (positive grandparental meaning, men) |
| References                        | Population | Sample characteristics                                                                 | Measure of grandparent's health/well-being                                                                 | Association                                                                 |
|----------------------------------|------------|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| Hughes et al. (2007)             | USA        | 12,872 grandparents; 50–80 years old; representative                                    | Health behaviors (smoking, problem drinking, exercise, obesity) and mental and physical health (depressive symp., SRH, chronic conditions, functional limitations) | neg. (women: SRH (start), smoking (contin.), pos. (women SRH (cont.))       |
| Ice et al. (2010)                | Kenya      | 287 Luo grandparents; 60 + years old; non-representative                               | BMI, glucose, hemoglobin, perceived health, mental health, systolic blood pressure (SBP)                    | neg. (perceived health, mental health; at \( p < 0.1 \): BMI)               |
| Ice et al. (2012)                | Kenya      | 640 Luo elders; 60 + years old; non-representative                                     | Perceived and physiological measures of stress (cortisol levels and BP)                                     | pos. (women: vitality, nutritional status; men: mental health), neg. (men: nutritional status) |
| Ice et al. (2008)                | Kenya      | 287 Luo grandparents; 60 + years old; non-representative                               | Mental and physical health                                                                                   | pos. (custodial gp: functional limitations, SRH, psychological well-being), neg. (happiness) |
| Komonpaisarn and Loichinger (2019) | Thailand  | 29,227 older people; 60–80 years old; representative                                 | SRH, functional limitations, psychological well-being, happiness                                           | pos. (mobility limitations; recent custodial caregivers only, not long-term) |
| Ku et al. (2013)                 | Taiwan     | 3711 grandparents; 50 + years old; representative                                      | SRH; depressive symptoms; mobility limitations; life satisfaction                                           | pos. (mobility limitations; recent custodial caregivers only, not long-term) |
| Minkler et al. (1997)           | USA        | 3111 grandparents; representative                                                    | Depression levels                                                                                           | neg                                                                          |
| Minkler and Fuller-Thomson (1999) | USA        | 173 custodial and 3304 non-custodial grandparents; representative                   | Summary measure of ADL limitations                                                                            | neg                                                                          |
| Minkler and Fuller-Thomson (2005) | USA        | 2362 African American grandparent caregivers with 40,148 non-caring peers; 45 + years old; representative | Functional limitations, limitations in ADL, income, and poverty                                               | neg. (women: functional limitations, income, poverty)                      |
| Musil et al. (2011)             | USA        | 485 grandmothers; non-representative                                                 | Caregiving stress and reward, intrafamily strain, social support, resourcefulness, depressive symptoms, mental and physical health, SRH, and perceived family functioning | neg. (stress, intrafamily strain, perceived family functioning, physical health, SRH, depressive symptoms, reward) |
| Musil (1998)                    | USA        | 90 grandmothers (58 had primary responsibility and 32 did not); 39–82 years old; non-representative | Health, depressed mood, anxiety, stress, coping, and social supports                                         | neg. (stress [subscales: parent/child dysfunctional interaction, parenting distress], subjective and instrumental support) |
| Musil (2000)                    | USA        | 74 grandmothers living in the same home as grandchild(ren), 49 primary caregiver grandparents, and 25 with partial/supplemental responsibility; 39–72 years old; non-representative | Self-assessed health, depression, parenting stress, anxiety, coping and social support                       | neg. (parenting stress [all subscales], instrumental support, depression) (no main effects on depression by caregiver status, but primary caregivers had higher time 2 depression scores) |
| Musil and Ahmad (2002)          | USA        | 86 primary caregiver grandmothers, 85 partial/supplemental caregiver grandmothers in multigenerational homes, and 112 non-caringer grandmothers; non-representative | Perceived stress, social support, self-assessed health, health problems, health visits, health maintenance, depressed mood | neg. (stress, instrumental support, self-assessed health, health problems, health visits), pos. (at \( p < 0.1 \): subjective support, depression) |
| References                  | Population | Sample characteristics                                                                 | Measure of grandparent's health/well-being                                                                 | Association                                      |
|-----------------------------|------------|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| Oburu and Palmerus (2005)   | Kenya      | 241 caregiving grandmothers; non-representative                                        | Stress levels                                                                                              | neg                                              |
| Solomon and Marx (1999)     | USA        | 11,591 women; 40 years and above; representative                                        | Health status                                                                                              | neg                                              |
| Strawbridge et al. (1997)   | USA        | 42 grandparent, 44 spouse, and 130 adult-child caregivers with 1669 non-caregivers; 46–75 years old; representative | Mental and physical health (surveyed in 1974 and 1994) (symptoms of depression, happiness, self-reported health, and prevalence of chronic conditions or activity limitations) | neg. (happiness, chronic conditions, activity limitations; at $p < 0.1$: depression, SRH) |
| Szinovacz et al. (1999)     | USA        | 1789 black and white grandparents; representative                                       | Grandparents' subjectivewell-being (depressive symptoms and life satisfaction)                               | neg. (women: depressive symptoms) & pos. (men: depressive symptoms; gc leaving the household increase) |
| Wilmoth et al. (2018)       | USA        | 2503 grandparents; non-representative                                                  | Well-being                                                                                                | neg                                              |
| Yalcin et al. (2018)        | Turkey     | 2563 women; 65 + years old; non-representative                                        | Quality of life (SF-12; mental and physical), health status (Visual Analog Scale of EQ-5D, VAS) and symptoms of depression (Beck Depression Inventory, BDI) | neg                                              |
| References          | Population | Sample characteristics | Measure of grandparent's health/well-being | Association                          |
|---------------------|------------|------------------------|------------------------------------------|--------------------------------------|
| Bigbee et al. (2011)| USA        | 485 grandmothers (rural–urban); non-representative | Physical and mental health               | ns                                   |
| Blustein et al. (2004)| USA    | 10,293 grandparents; 53–63 years old, representative | Depressive symptoms                      | neg                                  |
| Chen et al. (2015)  | USA        | 69,668 observations; 50+ years old; representative | Frailty index (FI)                       | neg                                  |
| Chen and Liu (2012) | China      | 14,954 person-year records; 55 and above; non-representative | Self-rated health (SRH)                  | neg                                  |
| Choi and Zhang (2018)| South Korea | 3092 grandmothers; 45 and above; representative | Self-rated health                        | ns                                   |
| Goodman (2003)      | USA        | 987 grandmothers (512 custodial grandmothers and 475 coparenting grandmothers); non-representative | Depression and life satisfaction         | ns                                   |
| Goodman and Silverstein (2002)| USA | 1058 grandmothers; non-representative | Grandmothers' well-being (negative affect, positive affect, life satisfaction, depression, and mental health) | neg. (African American), pos. (Latino), neg. (White) |
| Goodman and Silverstein (2006)| USA | 1051 grandmothers; non-representative | Grandmothers' well-being (negative affect, positive affect, life satisfaction, and depression) | pos. (Latino), neg. (African American) |
| Guo et al. (2008)   | China      | 1002 individuals; 50 years old and above; non-representative | Physical health status and mental health status | pos                                   |
| Hsu and Chang (2015)| Taiwan   | 14,193 observations from 4731 older persons; 60 years old or above; representative | Happiness                                | ns                                   |
| Hughes et al. (2007)| USA       | 12,872 grandparents; 50–80 years old; representative | Health behaviors (smoking, problem drinking, exercise, obesity) and mental and physical health (depressive symp., SRH, chronic conditions, functional limitations) | neg. (women: obesity (start + cont.); men: functional limitations (cont.), pos. (men: exercise) |
| Ku et al. (2012)    | Taiwan     | 4582 adults; 50–80 years old at first interview; representative | SRH; depressive symptoms; mobility limitations | ns                                   |
| Ku et al. (2013)    | Taiwan     | 3711 grandparents; 50+ years old; representative | SRH; depressive symptoms; mobility limitations; life satisfaction | pos. (srh [both long-term and recent caregivers], mobility limitations [recent caregivers only], depressive symptoms [long-term only]) |
| Musil et al. (2011) | USA        | 485 grandmothers; non-representative | Caregiving stress and reward, intrafamily strain, social support, resourcefulness, depressive symptoms, mental and physical health, SRH, and perceived family functioning | neg. (transitions to higher caregiving: physical health, stress, intrafamily strain, perceived family functioning), pos. (subjective support, instrumental support) |
| Musil (2000)        | USA        | 74 grandmothers living in the same home as grandchild(ren), 49 primary caregiver grandmothers, and 25 with partial/supplemental responsibility; 39–72 years old; non-representative | Self-assessed health, depression, parenting stress, anxiety, coping and social support | neg. (parenting stress) |
### Table 7 (continued)

| References       | Population | Sample characteristics                                                                 | Measure of grandparent's health/well-being                                                                 | Association                                                                                                                                 |
|------------------|------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Musil and Ahmad (2002) | USA        | 86 primary caregiver grandmothers, 85 partial/supplemental caregiver grandmothers in multigenerational homes, and 112 non-caregiver grandmothers; non-representative | Perceived stress, social support, self-assessed health, health problems, health visits, health maintenance, depressed mood | neg. (stress, subjective support; at p ≤ 0.1: depression), pos. (instrumental support)                                                        |
| Tsai et al. (2013) | Taiwan     | 914 elders in 1993, 1792 elders in 1999 and 2292 elders in 2007; 60 years old and above; representative | Depressive symptoms                                                                                     | pos. (less symptoms if living with children (&ge))                                                                                      |
| Yalcin et al. (2018) | Turkey     | 2563 women; 65 + years old; non-representative                                             | Quality of life (SF-12; mental and physical), health status (Visual Analog Scale of EQ-5D, VAS) and symptoms of depression (Beck Depression Inventory, BDI) | pos                                                                                                                                 |


### Table 8: Non-coresiding care: studies concerning the association between grandparental involvement and grandparents' health and well-being (n = 65)

| References                | Population                                                                 | Sample characteristics                                                                 | Type of grandparental Involvement                                                                 | Measure of grandparent's Health/well-being | Association |
|---------------------------|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------|-------------|
| Ahn and Choi (2019)       | South Korea                                                               | 27,947 observations for 8469 individuals; 45–84 years old; representative               | Grandparents’ caregiving status                                                                  | Cognitive functioning                      | pos         |
| Arpino and Bordone (2014) | 12 countries (Austria, Belgium, Denmark, France, Germany, Greece, Israel, Italy, Spain, Sweden, Switzerland) | 5610 women and 4760 men; 50–80 years old; representative                                  | Childcare (how often on average they cared for grandchild during last 12 months (5 point scale), hours per day grandparents look after grandchildren) | Verbal fluency, numeracy, delayed recall, immediate recall, orientation | pos. (verbal fluency) |
| Arpino et al. (2018)      | 20 countries (Austria, Belgium, Croatia, Czech Republic, Denmark, Estonia, France, Germany, Greece, Hungary, Israel, Italy, Luxembourg, the Netherlands, Poland, Portugal, Slovenia, Spain, Sweden, and Switzerland) | 83,427 observations of 42,868 individuals; 50–84 years old; representative               | Childcare (and being a grandparent, number of grandchildren, how often they engaged in grandchild care) | Subjective well-being (SWB)                         | pos         |
| Arpino and Gómez-León (2019) | 12 countries (Austria, Germany, Sweden, Netherlands, Spain, Italy, France, Denmark, Greece, Switzerland, Belgium, Israel) | 5012 men and 6784 women; 50–84 years old; representative                                  | Combination of grandchild care with other care roles                                            | Depressive symptoms                         | pos. (grandmothers, only gc care—no other care) |
| Ates (2017)               | Germany                                                                   | 1875 observations of 625 individuals; 40 years and above; representative                 | Childcare                                                                                       | Self-rated health (SRH)                     | ns          |
| Bates and Taylor (2012)   | USA                                                                       | 351 grandfathers; non-representative                                                    | Grandfather involvement (contact frequency, generative activities, commitment)                 | Mental health                              | pos         |
| Bates and Taylor (2016)   | USA                                                                       | 351 grandfathers; non-representative                                                    | Grandfather involvement (contact frequency, generative activities, commitment)                 | Mental health                              | pos         |
| Bigbee et al. (2011)      | USA                                                                       | 485 grandmothers (rural—urban); non-representative                                       | rural/urban effects, caregiver status                                                             | Physical and mental health                  | ns          |
| Bowers and Myers (1999)   | USA                                                                       | 101 grandmothers (23 custodial, 33 part-time carers, 45 regularly visiting grandchildren); non-representative | Level of caregiving (full-time, part-time, no care)                                             | Burden, parenting stress, grandparenting satisfaction, life satisfaction | pos. (gp satisfaction [part-time vs. non-caregiving], neg. (burden, parenting stress [full-time vs part-time], life satisfaction [full-time vs non-caregiving]) |
| References                        | Population                                      | Sample characteristics                                           | Type of grandparental involvement                  | Measure of grandparent's health/well-being | Association                      |
|----------------------------------|------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------|------------------------------------------|-------------------------------------|
| Brunello and Rocco (2019)        | 12 European countries (Austria, Germany, Sweden, Netherlands, Spain, Italy, France, Denmark, Switzerland, Belgium, the Czech Republic, and Poland) | 13,091 (7397 females and 5694 males); 50 years and above; representative | Childcare (hours per month)                     | Depressive symptoms                  | neg                                 |
| Burn et al. (2014)               | Australia                                      | 186 women; 57–68 years old; non-representative                | Childcare                                       | Cognition                                | neg. (high level of childcare), pos. (low-level of childcare) |
| Burn and Szoeke (2015)           | Australia                                      | 224 women; 65 + years old, non-representative                 | Childcare                                       | Cognitive function                      | pos                                 |
| Chen et al. (2015)               | USA                                            | 69,668 observations; 50 + years old; representative           | Grandparents’ living arrangements and in case of non-co-residing grandparents: amount of childcare | Frailty index (FI)                       | pos                                 |
| Choi et al. (2013)               | 14 countries (Denmark, Sweden, Austria, France, Germany, Switzerland, Belgium, the Netherlands, Spain, Italy, Greece, Israel, Czech Republic, and Poland) | 7,238; 60 + years old; representative | Five types of productive activities (paid work, formal volunteering, caregiving, informal helping and caring for grandchildren) | Depression                               | ns                                  |
| Choi and Zhang (2018)            | South Korea                                    | 3092 grandmothers; 45 and above; representative              | Grandparenting type and transition and grandparenting intensity | Self-rated health                        | pos. (overall nonresidential grandparenting) |
| Conde-Sala et al. (2017)         | 15 countries (Denmark, Sweden, The Netherlands, Switzerland, Luxembourg, Austria, Germany, Belgium, France, Slovenia, Czech Republic, Estonia, Spain, Italy, and Israel) | 33,241; 65 + years old; representative | Sociodemographic, socioeconomic factors, physical exercise and activities (including grandparenting), physical health, depressive symptoms, life expectancy and healthy life expectancy, suicide rate, gross domestic product (GDP) per capita based on purchasing power parity (PPP) | Perceived quality of life               | pos. (all countries combined & Mediterranean country cluster: caring for gc (yes/no) -> better perceived QoL) |
| Danielsbacka et al. (2019)       | 11 European countries (Austria, Germany, Sweden, Netherlands, Spain, Italy, France, Denmark, Switzerland, Belgium, and Czech Republic) | 41,713 person-observations from 24,787 persons; 50 and above; representative | Grandchild care for < 14-year-old grandchildren | SRH; difficulties with activities of daily living (ADLs); depressive symptoms; life satisfaction; meaning of life | pos. (ADL)                          |
| References                          | Population | Sample characteristics | Type of grandparental involvement | Measure of grandparent's health/well-being | Association |
|------------------------------------|------------|------------------------|-----------------------------------|------------------------------------------|-------------|
| Danielsbacka and Tanskanen (2016) | Finland    | 2152; 62–67 years old; representative | Contact frequencies with grandchildren | Grandparental happiness | pos. (maternal grandmothers, higher contact with gc → happier) |
| Di Gessa et al. (2016a)            | 10 European countries (Austria, Belgium, Switzerland, Germany, Denmark, Spain, France, Italy, the Netherlands, and Sweden) | 8485 people; 50 and above; representative | Intensive and non-intensive grandparental childcare | Subsequent health (self-rated health, depressive symptoms, and disability) | pos |
| Di Gessa et al. (2016b)            | 11 European countries (Austria, Belgium, Switzerland, Germany, Denmark, Spain, France, Italy, Greece, the Netherlands, and Sweden) | 8972 grandmothers and 6567 grandfathers; 50 years and above; representative | Intensive and non-intensive grandparental childcare | Latent continuous physical health variable based on self- and observer-measured indicators | pos. (grandmothers, both intensive and non-intensive care) |
| Fujiwara and Lee (2008)            | USA        | 724 adults; 25–74 years old; representative | Altruistic behaviors for children and grandchildren (ABC) (informal assistance, emotional support, financial support) | Major Depression (MD) | pos. (men: informal assistance 1–10 h/month, and financial support 1–50 $/month), neg. (women, at $p < 0.1: financial support 1–50 $/month) |
| García-Campos et al. (2010)       | Mexico     | 386 postmenopausal women; 55–75 years old; non-representative | Number of children and grandchildren and frequency of their contact (in addition: age, date of the last menstrual period, age at menarche, previous menstrual history, number of pregnancies and deliveries, height, weight and waist and hip circumferences, BMI, waist/hip ratio, schooling in years, work, hours of exercise per week, alcohol consumption, smoking habit) | Women's symptoms at postmenopause—hot flushes, vaginal dryness, depressive mood, anxiety, non-specific symptoms of depression (NSSD; problems with digestion, loss of sexual interest, and weight loss), empty nest syndrome (ENS) | neg. (caring for gc: loss of sexual interest, depression, NSSD, and ENS; meeting gc: ENC) |
| Grundy et al. (2012)               | Chile      | 2000 people; 66–68 years old; representative | Hours per week of grandchild care | Mental well-being two years later (life satisfaction, depression, Mental Component Summary (MCS) SF-36) | pos. (gf life satisfaction), pos. (gm less depression) |
| References               | Population          | Sample characteristics                                                                 | Type of grandparental involvement                                                                 | Measure of grandparent\'s health/well-being                                                                 | Association |
|-------------------------|---------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-------------|
| Guo et al. (2008)       | China               | 1002 individuals; 50 years old and above; non-representative                           | Whether the respondent currently helps with childcare; if the respondent lives with any grandchildren | Physical health status and mental health status                                                              | pos         |
| Hilbrand et al. (2017a) | Germany             | 516 older adults; representative                                                       | Grandparenting and supporting others in the social network                                          | Longevity                                                                                                  | pos         |
| Hilbrand et al. (2017b) | Germany             | 516 older adults; representative                                                       | Frequency of childcare                                                                                  | Time to death                                                                                                | pos         |
| Hsu and Chang (2015)    | Taiwan              | 14,193 observations from 4731 older persons; 60 years old or above; representative     | Social connection variables included living arrangements, contacts with children/grandchildren/parents/relatives/friends, telephone contacts, providing instrumental and informational support, receiving instrumental and emotional support, and social participation | Happiness                                                                                                   | ns          |
| Hughes et al. (2007)    | USA                 | 12,872 grandparents; 50–80 years old; representative                                  | Caring for grandchildren                                                                                | Health behaviors and mental and physical health                                                            | pos. (grandmothers: exercise & continued care; SRH & started care + continued care), pos. (gf: exercise & started care) |
| Jun (2015)              | South Korea         | 2341 female; 45–74 years old at time 2; representative                                | Grandchild care                                                                                        | Cognitive functioning                                                                                      | pos. (for higher educated, both instantaneous and lagged effect) |
| Kim et al. (2017)       | South Korea         | 5129 grandparents; 50 years old and above without depression; representative           | Intensity of grandchild care (hours spent caring for a grandchild per week)                           | Depressive symptoms                                                                                       | pos         |
| Komponpaisarn and Loichinger (2019) | Thailand       | 29,227 older people; 60–80 years old; representative                                 | Grandchild care for < 10-year-old grandparents                                                          | SRH; functional limitations; psychological well-being; happiness                                          | neg. (self-rated health, functional limitations, and psychological well-being) |
| Ku et al. (2012)        | Taiwan              | 4582 adults; 50–80 years old at first interview; representative                        | Grandparental childcare                                                                                  | SRH; depressive symptoms; mobility limitations                                                             | pos. (better SRH & less depressive symptoms; only significant for grandparents receiving financial support from adult children) |
| References                  | Population          | Sample characteristics | Type of grandparental Involvement                                                                 | Measure of grandparent’s Health/well-being                                                                 | Association                                                                                                                                 |
|-----------------------------|---------------------|------------------------|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Ku et al. (2013)            | Taiwan              | 3711 grandparents; 50+ years old; representative | Grandparental caregiving status (non-caregivers; three-generational; custodial; non-coresiding caregivers) | SRH; depressive symptoms; mobility limitations; life satisfaction                                         | pos. (better SRH & less mobility limitations for long-term non-coresiding caregivers), BUT ns. in FE-models (for nonresidential gps), ns. (depressive symptoms and life satisfaction; for recent caregivers, all outcomes) |
| Lee et al. (2019)           | South Korea         | 922 grandparents; 65 years old or above; non-representative | Grandparental childcare                                                                            | Depression scores, suicidal ideation                                                                   | pos. (moderate care and less depression) pos. (moderate and high care and less suicidal ideation)                                           |
| Luo et al. (2019)           | China               | 13,596; 50+ years old; representative                      | Caring for grandchildren                                                                           | Cognitive decline                                                                                      | pos                                                                                                                                 |
| Mahne and Huxhold (2015)    | Germany             | 990 grandparents; mean age 74 years; representative       | Relationship quality with children and grandchildren (measured with 2 variables: contact frequency and emotional closeness) | Subjective well-being (SWB), measured with life satisfaction, positive affect, negative affect, loneliness | pos. (lifesatisfaction, positive affect, negative affect (reduces), loneliness (reduces))                                                |
| Mansson (2014)              | USA                 | 104 grandparents; 60–91 years old; non-representative     | Grandparents’ expressions of affection (4 types: love and esteem, caring, memories and humor, and celebratory) | Psychological health (self-reported stress, loneliness, self-reported general mental health)            | pos. (stress, mental health)                                                                                                                                 |
| Markides and Krause (1985)  | USA                 | 1125 Mexican Americans; 65–80 years old; representative   | Intergenerational solidarity (association and affection)                                             | Psychological well-being—Life Satisfaction Index, Center for Epidemiologic Studies Depression (CES-D) scale | pos. (self-perceived affection with gc and gp life satisfaction)                                                                                                                                 |
| McGarrigle et al. (2018)    | Ireland             | 8504 people; 50+ years old; representative                | Grandchild care (numbers of hours of grandchild care reported in the past month)                    | depressive symptoms and quality of life                                                                  | neg. (those with primary education or lower and no active or social leisure: intensive care, both outcomes), pos. (tertiary-educated gp with no active or social leisure: intensive care, quality of life) (secondary-educated gp with active and social leisure: low-intensity care, quality of life) |
| References                     | Population                | Sample characteristics                                                                 | Type of grandparental involvement                                                                 | Measure of grandparent's health/well-being                                                                 | Association                                                                                      |
|-------------------------------|---------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Mellqvist et al. (2011)       | Sweden                    | 80 suicide attempters; 70 years old and above; non-representative                        | Social (e.g., too little time spend with grandchildren) and health variables                     | Sense of coherence (SOC) pos. (too little spend with children and grandchildren were both associated positively with lower SOC meaning that more time with them would most likely associate positively) | pos. (reward), neg. (physical strain) NOTE: comparing only gp caregivers to other types of caregivers |
| Monin et al. (2014)           | USA                       | 2025 U.S. veterans; 60 years old or above; representative                               | Age, gender, education, marital status, income, combat exposure, caregiving hours, caring for a grandchild or other, and scores on physical health, psychological health, cognitive functioning, the positive psychological factor, and social support factor | Physical strain, emotional strain, and reward                                                  | pos. (reward), neg. (physical strain) NOTE: comparing only gp caregivers to other types of caregivers |
| Moore and Rosenthal (2015)    | Australian                | 1205 grandmothers; 34–92 years old; non-representative                                  | Personal resources (age, health, education, being partnered) and grandmother engagement (number of grandchildren, hours/week spent with them, frequency of activities with grandchildren, grandmother satisfaction) | Generativity, life satisfaction, grandmother satisfaction                                    | pos. (frequency of activities: generativity, gm satisfaction) only correlation, ns. in regression: frequency of activities and life satisfaction; hours/week and gm satisfaction, ns. (hours/week; generativity and life satisfaction) |
| Muller and Litwin (2011)      | 11 European countries     | 3888 grandparents; 50 years old and above; representative                               | Grandparent role centrality (calculated with standardized frequency of contact, the summary score for beliefs on grandparenting, and the grandparent-focused role occupancy measure and summed) | Psychological well-being (depressive symptoms)                                                 | neg. (the more gp role centrality the more depressive symptoms)                                      |
| Neuberger and Haberkern (2014) | 14 European Countries    | 12,740 grandparents; 50 years and above; representative                                | Grandchild care, grandparent obligations                                                          | Quality of life                                                                                 | pos. (high gp oblig. & gp care -> better QoL)                                                   |
| References                  | Population                      | Sample characteristics                                                                 | Type of grandparental involvement                                                                 | Measure of grandparent's health/well-being | Association                          |
|-----------------------------|---------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------|
| Nimrod (2008)               | Israel                          | 383 recently retired individuals; 50 years old and above; non-representative            | Get-togethers (grandchildren as one group)                                                      | Life satisfaction                       | ns. (concerning gc)                   |
| O'Loughlin et al. (2017)    | Australia                       | 1261 men and women; 60–64 years old; representative                                      | Caregiving status (giving care to grandchildren or other family member/friend, yes/no and hours per week) | Mobility difficulties, self-rated health, subjective well-being (life satisfaction, quality of life) | ns. (grandchild care, all outcomes)   |
| Park (2018)                 | South Korea                     | 255 grandparents; non-representative                                                  | Grandparenting role type, involvement level, mediating effect of care burden (stress)          | Psychological well-being                | pos                                   |
| Sener et al. (2008)         | Turkey                          | 200 persons; 60+ years old; non-representative                                        | Socioeconomic, demographic (age, education, marital status, income, perceived healthiness, and physical distance from adult children), and relational frequency of contact with loved ones (children, grandchildren, siblings, and friends) and relational satisfaction | Life satisfaction                       | neg. (men; frequency of contact with gc) |
| Sheppard and Monden (2019)  | 15 countries (Austria, Belgium, Czechia, Denmark, Estonia, France, Germany, Italy, the Netherlands, Portugal, Slovenia, Spain, Sweden, Switzerland, and Israel) | 13,506 respondents (3511 (26%) transitioned to grandparent status); 50 years old and above; representative | Caring for grandchildren, (becoming a grandparent)                                              | Depression, life satisfaction, subjective life expectancy | ns. (gc care and outcomes)           |
| Sobol and Ben-Shlomo (2019) | Israel                          | 197 first time grandparents; non-representative                                        | Age, SES, education, gender, economic stress, work commitment, grandchild care burden, self-mastery, family support | Grandparents’ mental health, grandparents’ personal growth                                     | pos. (gc care burden & personal growth) |
| Szinovacz and Davey (2006)  | USA                             | 1200 grandfathers and 1481 grandmothers; 51–60 years old at wave 1, representative     | Retirement and grandchild care obligations                                                      | Well-being (depressive symptoms)         | neg. & pos. (gms; retired gms & extensive care – > neg; working gms & extensive care – > pos) |
| References                | Population     | Sample characteristics                                                                                                                                                                                                 | Type of grandparental involvement                                                                 | Measure of grandparent's health/well-being                                                                 | Association                                                                                     |
|--------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Tang et al. (2016)       | USA            | 2365 older adults (818 designated caregivers); 60 years old and above; non-representative (representative only of Chinese-American older adults in a large metropolitan area) | Grandparent caregiver status, caregiving time, burden, pressure, and perceived negative effect in caregivers | Psychological well-being (depressive symptoms, anxiety, stress, and loneliness)                       | pos. (being a caregiver: all outcomes)                                                          |
| Thiele and Whelan (2008) | Australia      | 149 non-custodial grandparents; up to 80 years old; non-representative                                                                                                                                                | Weekly childcare contact with grandchildren, grandparental meaning, generativity               | Grandparent satisfaction                                                                            | pos. (childcare hours → valued elder meaning, gp satisfaction [correlation only])               |
| Thomas (1986)            | USA            | 177 grandmothers and 105 grandfathers; 45–90; non-representative                                                                                                                                                    | Characteristics of grandparents’ families (grandchildren’s number and proximity, and ages of oldest and youngest grandchildren), grandparent characteristics (age, gender, marital status, and retirement status), and perceived responsibility scores (disciplining, caretaking, helping, and advising) | Grandparenting satisfaction                                                                          | pos. (cg care)                                                                                |
| Triadó et al. (2014)     | Spain          | 312 grandparents; 46–91; non-representative                                                                                                                                                                         | Socio-demographic variables (grandparent and grandchildren genders, ages, and family lines), indicators of intensity of care, the types of care provided, evaluation of behavioral problems in the grandchildren, satisfaction, and difficulties with care responsibilities | Number of health problems, perceived health, and satisfaction with life                               | neg. (time since care began → perceived health), pos. (hours per week → life satisfaction [ns. after controlling for difficulties with care]) |
| Tsai (2016)              | Taiwan         | 2930 grandparents; 50 years old and above, representative                                                                                                                                                            | Elders’ changing behavior in caring for grandchildren from 2003 to 2007, age, gender, educational level, work status and self-reported health status in 2007 | Changes in depression symptoms from 2003 to 2007                                                      | pos. (less depressive symptoms)                                                               |
| Tsai et al. (2013)       | Taiwan         | 914 elders in 1993, 1792 elders in 1999 and 2292 elders in 2007; 60 years old and above; representative                                                                                                           | Providing grandchild care                                                                                                                                  | Depressive symptoms                                                                          | pos. (providing no gc care → greater risk for depression or feeling lonely)                    |
| References                  | Population  | Sample characteristics                                                                 | Type of grandparental involvement                                                                 | Measure of grandparent's health/well-being                                                                 | Association                                                                                     |
|-----------------------------|-------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| Ward et al. (2019)          | Ireland     | 3646 respondents; representative                                                       | Gender, education and whether respondents lived with a partner; self-rated health, social connectedness, household income | Quality of life (QoL)                                                                                       | ns. (caring for gc was associated with QoL in baseline but not in longitudinal analysis)       |
| Wood and Robertson (1978)   | USA         | 257 grandparents; mean age 65; non-representative                                        | Grandchildren, friendship and organizations involvement                                        | Morale (life satisfaction)                                                                                 | pos. (association between gc involvement and life satisfaction)                                 |
| Xu et al. (2017)            | USA         | 2775 grandparents; 60 years old and above; representative                               | Grandparent caregiving time (hours/week), caregiving burden, and caregiving pressure            | Psychological well-being (depressive symptoms and quality of life)                                         | pos. (depressive symptoms)                                                                      |
| Xu et al. (2012)            | China       | 1704 caregivers; 60 years old and above, representative                                  | Grandparent caregiving intensity                                                                  | life satisfaction                                                                                           | pos                                                                                             |
| Xu (2019)                   | China       | 2663 to 3770; representative                                                            | Grandparents' self-reported family caregiving in the past year, gender and rural-urban residence | Mental health (life satisfaction and depressive symptoms) and physical health (levels of high sensitivity C-reactive protein (CRP; chronic inflammation and acute infection), hypertension, high-risk pulse rate, and diabetes) | pos. (urban grandfathers: depressive symptoms \(p < 0.1\); urban grandmothers: life satisfaction and chronic inflammation), neg. (rural grandfathers: high-risk pulse) |
| Yalcin et al. (2018)        | Turkey      | 2563 women; 65+ years old, non-representative                                          | Study vs. control group, age, education, income, number of children and grandchildren, mean number of grandchildren cared for, mean age of grandchildren receiving care, mean time spent on grandchild care, mean length of care per week, and length of day- and nighttime care | Quality of life (SF-12; mental and physical), health status (Visual Analog Scale of EQ-5D, VAS) and symptoms of depression (Beck Depression Inventory, BDI) | pos. (mean time spent caring for grandchildren per week \(\rightarrow\) BDI; mean duration of daytime care & mean duration of nighttime care \(\rightarrow\) SF-12 [mental and physical component], VAS), neg. (time spent caring for grandchildren to date \(\rightarrow\) BDI, VAS; mean time spent caring for grandchildren per week \(\rightarrow\) SF-12 [both components], VAS; mean duration of daytime care \(\rightarrow\) BDI; mean duration of nighttime care \(\rightarrow\) BDI) |
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