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Associations of family and social contact with health among Italian grandparents

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Abstract

Past research has documented the positive influence of frequent interactions with social networks on several health outcomes in later life, with different patterns by gender. In this study, we explore the association of frequent contact with different members of the social network (namely partner, grandchildren, siblings, friends and neighbours) on self-perceived health status and the limitation of illnesses among older grandparents in Italy, using a large national representative survey. Our results confirm the positive association between good health indicators and frequent contact with members of the “horizontal” network (partner, siblings and friends), while a more ambiguous association has been found with frequent face-to-face contact with children and grandchildren. The results hold for both male and female grandparents. The Mediterranean family-focused culture may possibly explain the distinctly Italian results.

Keywords: Social network, Health, Grandparents, Gender, Italy

Introduction

Social relationships strongly affect health outcomes in later life (e.g. Blazer, 1982, Gliksman et al. 1995, House et al. 1988, Sabin, 1993, Turner, & Marino, 1994, Avlund et al. 1998, de Leon et al. 2001, Haber et al. 2007, Youm et al. 2014). Numerous studies, mainly using data from the US and Western Europe, have reported evidence of a positive correlation between good health and social relations with relatives, friends or neighbours (House et al. 1988, Pinguart & Sørensen, 2000; Umberson & Montez, 2010). At the same time, recent articles that focus specifically on family relationships have raised some doubts about such positive correlations, leaving the question open to further investigation (Lüscher. 2002; Rook, 2014; Gilligan et al., 2015; Thomas et al., 2017).

The study of grandparental social and family relations has become a favourite topic of analysis for studies of family relationships, also when considering the growing number of families that rely on them as a source of support (Glaser & Hank, 2018; Settersten, 2007). Indeed, grandparents are at the centre of a complex interweave of family connections, both “vertical”, i.e. children and grandchildren, and “horizontal”, i.e. spouse and siblings. Moreover, they can also maintain social relations beyond the

family, with friends or neighbours, that overlap with family relations. The different aspects that may comprise a grandparent's social network and the growing importance of their role in the family make grandparents a particularly good fit for the study of associations between familial and social contacts, and health in later life.

A substantial body of research has investigated the relation between health of grandparents and frequency of family or social contacts (e.g. Bates & Taylor, 2013; Geurts et al., 2009; Drew & Silverstein, 2007), while others, focused on adults and older adults, have analysed the impact of other components of social relations. These studies investigated both structural aspects such as being in marriage, living with a partner/housemate, and functional aspects such as having neighbour or friends one can count on (e.g. Waite 1995; Franks et al. 2006, O'Campo et al. 2015; White et al. 2009). However, despite the complexity that characterises both the social relationships and their impact on health (Litwin & Stoeckel, 2013; Martire & Franks, 2014) rarely have quantitative studies simultaneously but separately analysed the associations between the various components of social relationships¹ and different health outcomes in later life, i.e. looking at various facets of networks for the same sample of respondents (Rasulo et al. 2005). Moreover, though almost all the past studies have provided evidence of significant correlations between social relationships and health, as well as pivotal gender differences, the sign of such correlations is unclear, especially with regard to the grandparent-grandchildren relation. Some studies found positive correlations (e.g. de Leon et al., 2001; Youm et al., 2014), some others found negative correlations (e.g. Arpino & Bordone, 2014; Glaser et al., 2014) and still, others found no associations (Davey et al., 2009)².

We hypothesise that the recent contradictions in literature could be attenuated by a quantitative approach able to distinguish between the concomitant effects of overlapping social relationships on different health outcomes. Such a "comprehensive" approach should separately but simultaneously measure the association between different aspects of social relationships (within and outside the family, structural and functional) and different typologies of health outcomes, at the same time controlling for a wide range of demographic and socioeconomic variables related to health, for the same sample of respondents (Deindl, 2015).

In the present study, we tempt to adopt such a "comprehensive" approach, analysing a broader range of social contact and health outcomes. In other words, we have been able to introduce simultaneously, as interest variables in our model, several indicators that refer to different relational dimensions of the social network but to the same sample of respondents. Taking advantage of the multidimensional aspects that may constitute a grandparent's social network, we test the hypothesis that simultaneous but distinct associations between different components of social relations and different typologies of health measures may exist. Disentangling clearly the contribution of each aspect of social relationships in the association with health will help in explaining some of the apparently contradictory results of past studies, which have been limited by a partial analysis of the complete picture, especially with regard to grandparent-grandchildren relations. In other words, looking at various facets of networks for the

¹See section 2.

²See section 2.1, "The family network"

same sample of respondents, we can control for potential mediators and confounders relative to different but overlapping aspects of one's social network (for example, one could be in good health and could have frequent contact with grandchildren, but also with siblings, have close links with friends beyond the family but also with children: this could lead to misreporting the significance and magnitude of the correlations when observing only one type of social contact).

Moreover, we expect that a simultaneous but separate analysis of the various associations will attenuate what was previously accounted for as gender differences. The social network literature has well evidenced how men and women experience different forms of social relationships, especially at later ages (Fischer & Beresford, 2014). We hypothesise that what has been previously accounted for as a different "effect" of the (same) social relation component could be also explained by a different (unobserved) configuration of the social network (cf. Pinquart & Sörensen, 2006).

Lastly, in this article, we use a large sample of Italian grandparents (more than 7800 people), aiming to fill another gap of current literature that has provided very few quantitative results based on data from the Mediterranean countries and even less based on large samples. Indeed, taking advantage of a large sample, we are able to provide robust estimates measuring several variables simultaneously.

The relation between social relationships and health of grandparents

Review of literature reveals that social relationships are a multidimensional construct and include "structural" and "functional" aspects (Antonucci & Akiyama, 1987, Lynch, 1998, Steinbach, 1992) that mainly impact health through two different mechanisms: a "direct" effect and a "buffering effect" (Stansfeld 2006).

The term "structural" has been used primarily to refer to the type of contact (e.g. "family focused", "friend focused" or "diverse"), the number of contacts (size) and the frequency of contact (network interaction). These components make up the "social network" (e.g. Litwin & Stoeckel 2013, Cheng et al. 2014, Marquez et al. 2014). The quality and type of support provided and received, instead, relates to the "functional" aspect of social relations and makes up "social support". This aspect includes both the availability of friends or neighbours one can count on and the activities related to social exchange, such as receiving and giving help inside and outside the family (e.g. O'Campo et al. 2015; Albertini et al. 2007).

Evidence seems to suggest that structural and functional aspects of social relationships have a direct association with health (York et al. 2009, Cornwell 2009, Abuladze & Sakkeus 2013, Wagner & Brandt 2015), but also help to mediate (moderating or amplifying) the impact of acute or chronic stressors on health. This is called the "buffering effect" (Kawachi et al., 1997, Park et al. 2013). Moreover, Berkman et al. (2000) argue that the impact of social relations on health should be considered a *cascading causal process*, including both biological (Hawkley & Cacioppo, 2004) and social mechanisms (e.g. Christakis & Fowler, 2007, Marquez et al. 2014).

Although since the 1980s a growing number of studies have documented a positive association of some components of social relationships (mainly contact frequency) with various health outcomes (including mortality) and wellbeing (e.g. Blazer, 1982, Gliksman et al. 1995, House et al. 1988, Sabin, 1993, Turner, & Marino, 1994, Avlund et al. 1998, de Leon et al. 2001, Haber et al. 2007, Youm. et al. 2014), only recently has there

been increasing evidence to suggest that social relationships may have also a negative effect on health, especially when related to grandparents and to care activities (Reitzes & Mutran, 2004, Arpino & Bordone 2014, Burn & Szoeke 2014, Glaser et al. 2014). Nevertheless, despite the complexity of the associations between social relationships and health, the greater part of the quantitative literature still only associates few aspects of the social relationships and one health measure at a time.

In the following sub-sections, we summarise the most recent findings in the study of the association between social relationships and health of aged people, and, when available, among grandparents, underlining the different components analysed, the recent contradictions in results and the possible explanations suggested by past studies. We conclude by advancing and describing our approach, hypotheses and expectations in the last sub-section.

The “family network”

Several studies on the association between social relationships and health consider the potential impact of the family network. This includes both the partner and family members beyond the partner (children, grandchildren, siblings and relatives).

The beneficial effect of having a partner in later life has been universally established (e.g. Lillard & Waite, 1995, Ren 1997), particularly for men. Being married promotes health as the partner can monitor health-related behaviours and encourage self-regulation (Waite, 1995, Franks et al. 2006, Stephens et al. 2009). Marriage also assumes a sharing of economic and social resources and provides the partner with additional sources of support and help, and this particularly applies to men (Waite, 1995, Ren, 1997). The beneficial effect of marriage seems to have even increased in recent times (Kravdal et al. 2018).

Studies on the “vertical” relations with family members (children and grandchildren) present quite contradictory results. Several studies have found that close relationships and contact with grandchildren keep grandparents feeling young (Bordone & Arpino, 2016) are a source of pride (Harwood & Lin, 2000) and promote a sense of self-esteem due to the satisfaction of fulfilling normative expectations (Reitzes & Mutran, 2004; Silverstein & Marengo, 2001; Silverstein et al. 1998). Drew & Silverstein (2007) and Drew & Smith (1999) have also found that the loss of contact with grandchildren negatively affects grandparents’ symptoms of depression. Nevertheless, relationships between grandparents and grandchildren may lead to tension, disappointment, unpleasantness and ultimately to a negative association with health (e.g. Arpino & Bordone, 2014; Burn & Szoecke, 2014; Glaser et al. 2014; Hebblethwaite & Norris, 2010). Recent studies on the relation between grandparents and adult children report that closeness and assistance are correlated with both positive and negative feelings (e.g. Willson et al. 2006, Guo et al. 2013, Di Gessa et al. 2016), sometimes leading to inconclusive results. Finally, Davey et al. (2009) found no significant association between the health of grandparents and closeness with their grandchildren, regardless of the type of grandparental relationship (i.e. maternal or paternal). Aside from methodological differences in past studies, i.e. how contact and relations were measured, researchers argued three possible explanations to such contradictory results in literature: the potential stress due to the excessive and intense caregiving activity of grandparents (Lee et al. 2016; Armstrong et al. 2005), the reverse association in

the case of aged people who need help or support (Reitzes & Mutran, 2004), and the so-called intergenerational ambivalence (Gilligan et al. 2015), that is, according to the definition of Lüscher (2002), the “simultaneous coexistence and opposition of harmony and conflict in intergenerational relations”.

Regarding the relations of the “horizontal” network, the role of siblings in the association of health and mortality in later life has been less explored. Sibling relations develop in early childhood and continue through life. Siblings may provide companionship and emotional support, validating the older person’s memory as they have a shared family history. A number of studies have found that siblings may feel a greater sense of closeness in their later years, reducing conflict and deepening their acceptance of one another (McCamish-Svensson et al. 1999, White 2001). Another study based on older twins found that frequent contact between identical compared with fraternal older twins has a beneficial effect on their survival (Rasulo et al. 2005).

However, as only a few of these studies included other aspects beyond familial ones in their analysis, these results could also be limited or influenced by a partial vision, unable to separate the concomitant effects of overlapping social networks.

Friends and neighbours

Unlike studies focused on the family network, literature on social relations beyond the family (friends and neighbours) seems to be more consistent and oriented to assigning a positive association to social relationships and good health.

As regards to contact with friends, past research show that it is often characterised by reciprocity, the feeling of being needed, and, unlike family ties, is not seen as an obligation (Powers & Bultena, 1976, Connidis & Davies, 1990, Field, 1999, Sherman et al. 2000; Litwin & Stoeckel 2013). According to Adams and Blieszner (1989), having significant relationships beyond the household enables the older person to feel a sense of competence in their ability to reciprocate, without the sense of obligation that may come with assistance given and received within the family (Cornwell 2009).

The effect of the neighbourhood on health has been variously investigated in literature (Stafford & McCarthy 2006). With respect to social support aspects, White et al. (2009) and O’Campo et al. (2015) measured the social cohesion of the neighbourhood network using as proxy a question on the perception of availability of help from neighbours. For example, O’Campo et al. (2015) found that people who feel that they live in a neighbourhood with people around who were willing to help their neighbours reported better health outcomes, particularly with respect to depression, anxiety and obesity.

The role of gender and cultural context

The role of gender has been widely investigated in studies of the association of social relationships with health, nonetheless leading to contradictory or inconclusive results. On the contrary, the cultural context has been poorly investigated despite its importance, which has been underlined by many authors (e.g. Viazzo, 2003; Kalmijn & Saraceno, 2008; Daatland & Herlofson, 2003; Albertini et al. 2007). Associations between social relationships and health are reported to have different gradients and significance between older men and women (e.g. Park et al. 2013, Melchior et al. 2003). Some studies have found that

grandchildren perceive their relationships with their grandmothers stronger compared to their grandfathers (Roberto & Stroes 1992), others found a positive correlation between health and frequency of contact, but for grandfathers only. Reitzes & Mutran (2004) found poor health to be positively correlated to grandchild contact for grandmothers but related negatively to such contact for grandfathers. Nevertheless, Cheng & Chan (2006) found no gender effect in a study on older adults in Hong-Kong. Moreover, males and females experience different forms of social relationships, especially in later life (Fischer & Beresford, 2014). We advance the hypothesis that what was accounted for in previous studies as a different “effect” of the (same) social relation component could be the consequence of a divergent (unobserved) composition of social relationships, inside and outside the family. For example, Pinquart & Sörensen conclude in their meta-analysis in 2006 that gender differences in the association of caregiving with depression and physical health can be explained since women experience more caregiving stressors. Statistically controlling for different types of caregiving tasks reduce the size of gender differences in the association between health and caregiving. Similarly, gender differences in the association of family and social contacts with health can be explained by gender differences in the set of contacts. We expect, therefore, that a simultaneous but separate analysis of the various associations will attenuate what was previously accounted for as gender difference. In the specific, as Litwin (2009) pointed out, a strong limitation in several past studies lies in the absence of non-family-related ties among the types of social contacts analysed. On the one side, the different compositions of social ties (inside as outside the family) among men and women may explain part of observed gender differences. On the other side, the different but limited spectrum of social ties analysed in the previous studies may explain the inconsistencies in literature.

Despite a general consensus on the peculiarity of the Mediterranean countries in several aspects of social relationships and their association with health (e.g. Viazzo, 2003; Kalmijn & Saraceno, 2008; Daatland & Herlofson, 2003; Albertini et al. 2007), a smaller number of studies based their analysis using data from such countries or in a comparative perspective (Albertini et al. 2007; Lowenstein & Daatland, 2006; Litwin, 2009; Deindl et al. 2015), i.e. the association of multiple aspects of social relationships with different measures of health by gender. According to literature, social networks in Mediterranean countries might be more “familial”, i.e. people might have larger family networks, more social exchange inside the family and more expectations of family interactions than their counterparts in non-Mediterranean countries. When the expectations are not fulfilled, for example in the case of lower or absent contact with family members, the Mediterranean people are expected to experience a greater sense of loneliness resulting in poor self-rated health (van Tilburg et al., 1998). In contrast, when the expectation is fulfilled, a significant positive effect can be attenuated by a sense of simple fulfilment of social norms (Litwin, 2009). Nevertheless, a confirmation of such a theoretical paradigm could only come from a comprehensive approach, comparing the simultaneous effects of familial and external social ties. Indeed, Litwin himself pointed out as: “[...]A second limitation stems from the social network variables currently available within the SHARE questionnaire. Although SHARE provides a wide range of social network indicators, others are still missing, particularly measures of non-family-related ties and subjective appraisals of various aspects of network capacity. [...]” (Litwin, 2009).

Social relationships and health of grandparents: a broader approach

The main aim of the present work is to assess whether there are significant but distinct associations between different components of social relationships and the health of grandparents, differentiated by gender. For this purpose, we attempt to adopt a “comprehensive” approach, analysing simultaneously but separately, both different aspects of social relationships and different measures of health in the same sample of respondents. We test our hypotheses on data from a large sample of Italian grandparents, aiming to contribute substantially to a better understanding of the “familial” peculiarity of the Mediterranean countries and verifying the validity of current theoretical frameworks. Since the focus of the study is on grandparental social relationships (therefore, only grandparents have been selected as the target population), we have devoted a significant part of this study to the grandparent-grandchildren relationship. We believe that a broader approach will help to overcome some contradictions in literature, clearly assessing the different contributions of each component of social relationships in the association with the health of grandparents. Moreover, we expect that a broader approach will also attenuate gender differences. In more detail, we analyse the association by gender between two measures of health (health-related limitations in the activities of daily living, and self-perceived health status) and several aspects of social relationships that consider contacts both inside and outside the family (siblings, spouse, children and grandchildren vs. housemates, friends and neighbours). In addition, we include in our analysis both structural and functional aspects (frequency of contact with siblings, children and grandchildren vs. the presence of social ties with friends and neighbours one can count on), as well as other potential demographic (age, geographical region and living arrangements) and socioeconomic covariates (education, subjective financial situation of the family and work status), since all these variables have been shown to be associated with health.

Data and methods

Sample

In order to explore the association between health and frequency of contact with family members and the presence of neighbours and friends among Italian grandparents, we use the data collected in the Family (“Famiglie e Soggetti Sociali”) survey carried out by the Italian Institute of Statistics (ISTAT) in 2009. This survey is based on households selected from the Register of Population and living in the community. It is carried out periodically and it represents the main statistical source of knowledge on the family structure and the social characteristics of the family in Italy. Data collected have a cross-sectional structure; therefore, our analysis aims at describing relationships (and not causality) between the frequency of contact with grandchildren, children and siblings and the availability of friends and people living nearby they can count on, of grandfathers and grandmothers, and their functional and self-perceived health. Nevertheless, this survey has as a strong point a very high sample size (around 24,000 households and 50,000 people) and has a quite high response rate (more than 80%). The survey includes a wide variety of topics, such as household structure, demographic background, socio-economic characteristics and life histories of each member of the household. The sections on health status and social and family exchanges are relevant

for this work as they include information on household composition and the availability of friends and kin (children, parents, grandchildren and other relatives) and contact. For our study, we only selected grandparents (with at least one non-co-resident grandchild) aged 60 and older (born before 1949), as most of the literature on the association between health in social contacts in later life (and most of grandparents are in this age group as shown below) use age 60 or 65 as a threshold, when health problems may occur (Litwin 2009). Our sample therefore includes 7887 individuals.

Dependent variable

As a measure of health, we considered the presence of health-related limitations in the activities of daily living, and self-perceived health status. It is important to use two different indicators to analyse associations with social networks. Limitations in the activities of daily living may be linked to functional support (therefore, the help received from different members of the network) and represent a more objective measure of health, while self-perceived health status may also comprise general satisfaction and wellbeing. As far as health limitations are concerned, the questionnaire asks, "To what extent do you have limitations in your activities of daily living caused by health problems that have lasted at least 6 months?" and the possible responses were: "no limitations", "mild limitations" and "severe limitations". As far as self-perceived health status is concerned, the question in the questionnaire was "How is your health in general?" and the possible answers were: "very good", "good", "fair", "poor" and "very poor". We recorded the answers into three categories: "very good/good", "fair" and "poor/very poor".

Independent variables

As we are considering a sample of grandparents, the main variable of interest concerns the frequency of contact with grandchildren and its association with health outcomes. While compiling the questionnaire, grandparents were asked to indicate, for up to three non-co-resident grandchildren, the frequency of face-to-face contact (every day, more than once a week, once a week, once or more times a month, less than once a month or never). For those who had more than three grandchildren living outside the household, the questionnaire was restricted to the three living the nearest. For our analyses, we created a dummy variable equal to one for grandparents who see at least one of their grandchildren at least once a week. Additionally, we create a dummy variable equal to one (and otherwise equal to zero) for those grandparents who have at least weekly contact with at least one of their children, and a variable distinguishing grandparents who have at least weekly contact with at least one of their siblings from those who have less frequent contact or no siblings at all.

A second set of variables concerns the availability of support when in need from someone living nearby (neighbours or friends), excluding relatives. In the original question, the possible answers were: "no one"; "one person or one family"; "more people or more families". We dichotomized the variable into the presence or absence of someone, as a measure of potential support. Another dummy variable indicating the presence of one or more friends they can count on when in need has been created. Also in this case the original variable had more categories ("yes, I have friends I can count on", "no, I

don't have friends I can count on", "I don't know"), but we grouped the categories "no" and "I don't know" into one category, since the number of grandparents who answered "I don't know" is very low and most likely means they do not have such friends.

Other covariates

In order to control the effect of potential confounders on grandparental functional and subjective health status, we include some demographic and socio-economic characteristics that have previously been found significant for their association with health.

We group age in classes (60–69, 70–79 and 80 plus) because of the non-linear effect of age on health in later life (Blanchflower et al. 2008). Geographical region is a reclassification of the actual regional division of Italy into north, centre and south according to the classification of the Italian National Institute of Statistics. Regarding living arrangements, we consider those who live with a spouse/partner (with or without other people), those who live without a spouse and with other people and those who live alone. We prefer an indicator for living arrangements instead of marital status to have information on different stages of the life cycle. As grandparental socio-economic indicators, we include education (1 when grandparents have a secondary school diploma or higher, 0 for lower levels), the perceived financial situation of the family (equal to one when the family financial resources are described by respondents as adequate or excellent). Unfortunately, no other questions on the actual income of the household are included in the questionnaire. However, several studies confirmed the validity of perceived income adequacy as a reliable measure of economic status in late life (Litwin & Sapir 2009; Arber et al. 2013), and as good as predictor of self-reported health status (Turrel 1999; Tucker-Seeley R. et al. 2013). Working status is represented by a dummy variable identifying all grandparents who are still in the workforce. Unfortunately, the survey does not include lifestyle questions such as smoking, drinking and physical activities; so these variables are not considered in our analysis.

Statistical analysis

In preliminary bivariate analyses, the presence of a significant association between each of the considered categorical variables and the outcome is revealed through a chi-squared test. Age was instead tested with respect to the outcome through the non-parametric Kruskal-Wallis test which rejected the null hypothesis that the presence of health problems is independent of age.

In the multivariate analyses, the outcome variables (which are categorical) were modelled using the multinomial logistic regression. For the outcome variable "limiting health problems", the category "no limitation in the activities of daily living caused by health problems" is the reference category, while for the outcome variable "self-perceived health status" the reference category is "good/very good health". The coefficients are presented in the plots (and in the appendix tables) as relative risk ratios (RRR), which means that they can be interpreted as the amount of additional probability (or reduction in probability) in the considered category rather than in the reference category due to the related covariate. Since all the covariates result significantly associated with the outcome in the preliminary bivariate analyses, they are all included in the models. The covariates used in the models are all categorical. All tests are considered

significant at a 5% level. In addition to the RRRs, we calculated the marginal effects at means (MEM) that measure the impact that a unit change in one variable has on the outcome variables while all other variables are held constant: tables with MEMs are in the appendix of the paper. All analyses are performed using STATA software (release 12.1; StataCorp, College Station, TX).

Results

Descriptive characteristics of respondents

In order to describe grandparental age distribution by gender, Fig. 1 represents the sample distribution (5-year-age classes). For both grandfathers and grandmothers, 70–74 years is the modal class of age.

Table 1 presents the distribution of grandparents in terms of health-related limitations in activities of daily living and self-perceived health status. More than half of grandfathers do not suffer limitations, while the proportion is lower for grandmothers. The proportion of grandparents perceiving themselves in good health is lower with just one third of grandmothers reporting a good health status.

Table 2 shows the frequency of grandparents who have siblings and friends, and the number of children and grandchildren (all the older people selected for the analysis have children and grandchildren as only grandparents have been selected, except for 16 grandparents who did not have living children at the time of the survey).

Tables 3, 4, 5, and 6 show the descriptive statistics for grandfathers and grandmothers, respectively. Most grandfathers (84.7%) live with their spouse, 10.9% live alone and 4.4% live without a spouse and with other people, while, among grandmothers, 51.7% live with a spouse, 33.4% live alone and 14.9% live without a spouse and with other people. Respectively, 81.5% of grandfathers and 80% of grandmothers have weekly contact with at least one grandchild. A large majority (87.6% of grandfathers and 87.5%

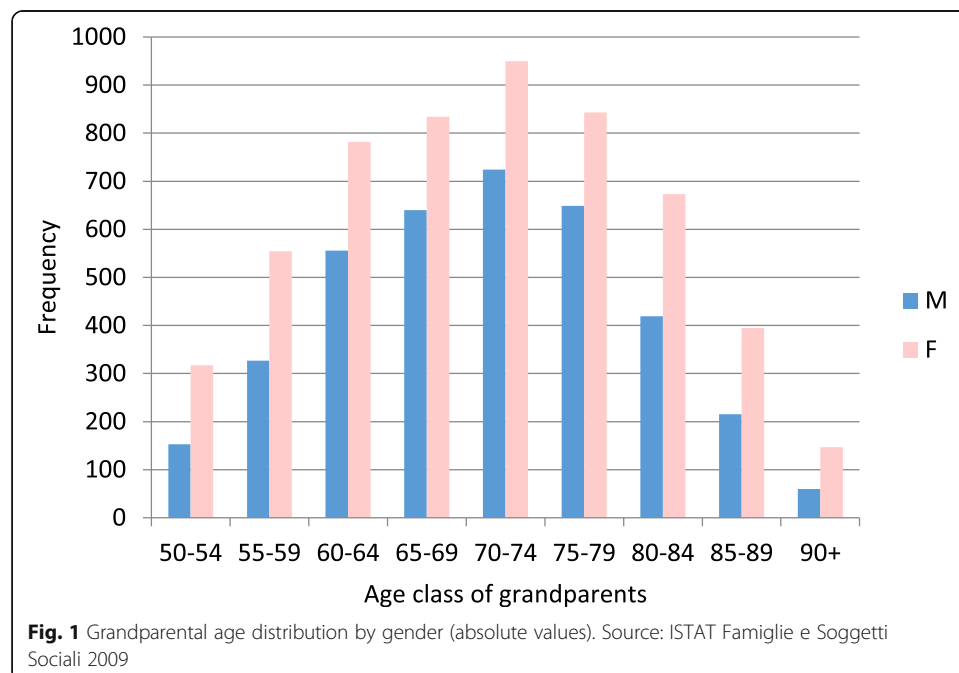


Table 1 Grandparents aged 60 years or more with health-related limitations in the activities of daily living and self-perceived health status

	Grandfathers		Grandmothers		Total	
	Freq.	%	Freq.	%	Freq.	%
Health-related limitations in activities of daily living						
No limitations	1802	55.2	2220	48.0	4022	51.0
Mild limitations	966	29.6	1,536	33.2	2502	31.7
Severe limitations	495	15.2	868	18.8	1363	17.3
Self-perceived health status						
Very good/good	1384	41.3	1513	32.7	2861	36.3
Fair	1296	39.7	1984	42.9	3280	41.6
Poor/very poor	619	19.0	1127	24.4	1746	22.1
Total	3263	100.0	4624	100.0	7887	100.0

Source: ISTAT Famiglie e Soggetti Sociali 2009

of grandmothers) have frequent contact with children and 37.2% of grandfathers and 34.7% of grandmothers have weekly contact with siblings. The percentage of grandfathers and grandmothers with friends on whom they can count when in need is 46.6% and 41.4%, respectively, and about half of the sample have someone living nearby on whom they can count when in need (48.8% for grandfathers and 49.9% for grandmothers).

In preliminary bivariate analyses, all independent variables and covariates taken into account result strongly significantly associated with health status (Tables 3 and 4), both in terms of the presence of mild or severe limitations caused by health problems and self-rated health status. There is the exception of the association between weekly contacts with children, and both the presence of limiting problems and the self-perceived health status for grandfathers (the association between weekly contacts with children and the self-perceived health status is only significant with $p < 10\%$). Additionally, the association between the presence of someone living nearby they can count on and the self-perceived health status is not significant among grandfathers. Tables 5 and 6 reveal an interesting difference between males and females. Whereas the distributions are very similar with respect to contact with grandchildren and children (a difference of 1.5% and 0.1%, for grandchildren and children respectively), they present remarkable

Table 2 Availability of family members and friends of grandparents aged 60 years or more

		Grandmothers (%)	Grandfathers (%)	Total (%)
Having grandchildren:	1 grandchild	919 (19.9%)	761 (23.3%)	1680 (21.3%)
	2 grandchildren	1135 (24.5%)	838 (25.7%)	1973 (25.0%)
	3 grandchildren or more	2570 (55.6%)	1664 (51.0%)	4234 (53.7%)
Having children:	no children alive	15 (0.3%)	1 (0.0%)	16 (0.2%)
	1–2 children	2802 (60.6%)	2017 (61.8%)	4819 (61.1%)
	3 children or more	1807 (39.1%)	1245 (38.2%)	3052 (38.7%)
Having siblings alive		3623 (78.4%)	2676 (82.0%)	6299 (79.9%)
Having friends		1898 (41.1%)	1519 (46.6%)	3417 (43.3%)
Having someone living nearby they can count on		2307 (49.9%)	1593 (48.8%)	3900 (49.5%)
Sample size		$N = 4624$	$N = 3263$	$N = 7887$

Source: ISTAT Famiglie e Soggetti Sociali 2009

Table 3 Descriptive characteristics of grandfathers ≥ 60 years by the presence or absence of limitative health problems (data are expressed as the percentage, except for age)

		No health problems (N=1802)	Mild health problems (N=966)	Severe health problems (N=495)	Total (N=3263)
At least weekly contact with grandchildren***		84.3	79.4	75.4	81.5
At least weekly contact with children		88.4	85.9	85.7	87.6
At least weekly contact with siblings***	% no siblings	16.0	19.5	22.2	18.0
	% having sibling but less than weekly contacts	44.0	46.1	45.3	44.8
	% at least weekly contacts	40.0	34.5	32.5	37.2
Social network	% having friends***	50.7	45.0	34.3	46.6
	% having someone living nearby they can count on when in need**	49.2	51.2	42.8	48.8
Age***	Median age	70	75	78	72
Education***	% with a diploma or more	23.9	14.7	10.1	19.1
Region***	% north	42.7	34.2	32.3	38.6
	% centre	20.3	18.9	21.2	20.0
	% south	37.0	46.9	46.5	41.4
Living arrangements***	% living alone	8.9	11.8	16.6	10.9
	% living with partner	87.7	83.1	77.0	84.7
	% living without a spouse and with other people	3.4	5.1	6.4	4.4
Work status***	% in the workforce	12.8	5.1	1.6	8.8
Subjective financial situation***	% economic resources of the family are considered at least adequate	68.2	59.5	48.5	62.6

Asterisks indicate statistically significant differences by health status: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

differences with regard to having friends, but only when the grandparents report fair, poor or very poor self-perceived health (5.5% in general, 5.5% and 6.8% for fair and poor self-rated health, respectively). This is in line with our hypotheses on possible explanations of the contradictory or inconclusive results found in literature: a divergent (unobserved) composition of overlapping social networks in a later age may lead to a misreporting of the effect of specific types of contact and may overestimate gender differences. Indeed, these differences in network composition are unobserved in many past studies and so are its potential effects on the health of individuals. Gender differences in the association between family-related ties and health could mask unobserved gender differences in having non-family-oriented ties. In particular, better health outcomes are more frequently associated with stronger familiar and social ties, both in terms of family members with whom they have at least weekly contact and in terms of the availability of friends or someone else they can count on living nearby. Moreover, those with health problems are older compared to grandparents in good health and health status results better for those who have higher education and a positive response to the subjective financial situation. Both for grandfathers and grandmothers in southern Italy, there is a lower percentage of respondents who have no limitations and report

Table 4 Descriptive characteristics of grandmothers ≥ 60 years by the presence or absence of limitative health problems (data are expressed as a percentage, except for age)

		No health problems (N = 2220)	Mild health problems (N = 1536)	Severe health problems (N = 868)	Total (N = 4624)
At least weekly contact with grandchildren***		82.8	78.8	74.7	80.0
At least weekly contact with children***		89.1	87.3	83.6	87.5
At least weekly contact with siblings***	% no siblings	17.3	24.9	26.9	21.6
	% having sibling but less than weekly contacts	42.2	43.8	47.1	43.7
	% at least weekly contacts	40.5	31.3	26.0	34.7
Social network	% having friends***	48.0	36.9	30.7	41.1
	% having someone living nearby they can count on when in need**	51.4	50.5	45.2	49.9
Age***	Median age	70	76	79	73
Education***	% with a diploma or more	14.8	9.1	7.1	11.4
Region***	% north	46.9	35.9	34.8	41.0
	% centre	20.4	18.0	21.8	19.8
	% south	32.7	46.1	43.4	39.2
Living arrangements***	% living alone	26.7	39.3	40.0	33.4
	% living with partner	62.1	45.6	36.0	51.7
	% living without a spouse and with other people	11.2	15.1	24.0	14.9
Work status***	% in the workforce	3.5	0.9	0.5	2.1
Subjective financial situation***	% economic resources of the family are considered at least adequate	65.4	55.5	46.7	58.6

Asterisks indicate statistically significant differences by health status: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

good or very good health status compared to central and northern Italy, as was also found in previous studies.

Multivariate analysis

Figures 2 and 3 show the results of the multinomial logistic regression models estimating respectively the probability of having mild or severe limitations, and fair or poor/very poor self-rated health status, adjusting for various socio-demographic characteristics and run separately for grandparents and grandmothers, for a total of 4 models estimated. The first model shows that grandfathers who have at least weekly contact with grandchildren have a significantly ($p < 0.5$) lower probability of having severe (but not mild) health limitations, while the frequency of contact with children and siblings is not significantly associated with the outcome. Similarly, having friends they can count on is significantly associated with a lower probability of severe (but not mild) health limitations. The presence of someone they can count on when in need is, instead, not significantly associated with the presence of severe limitations caused by health problems, but it is significantly associated with a greater probability of having mild health problems.

Table 5 Descriptive characteristics of grandfathers ≥ 60 years by self-perceived health status (data are expressed as the percentage, except for age)

		Good/very good (<i>N</i> = 1348)	Fair (<i>N</i> = 1296)	Poor/very poor (<i>N</i> = 619)	Total (<i>N</i> = 3263)
At least weekly contact with grandchildren***		84.6	80.9	75.8	81.5
At least weekly contact with children		88.6	87.0	85.0	87.6
At least weekly contact with siblings***	% no siblings	16.1	17.6	22.9	18.0
	% having sibling but less than weekly contacts	44.0	45.0	46.1	44.8
	% at least weekly contacts	39.9	37.4	31.0	37.2
Social network	% having friends***	52.5	45.1	36.8	46.6
	% having someone living nearby they can count on in when in need	50.2	48.6	46.4	48.8
Age***	Median age	69	74	77	72
Education***	% with a diploma or higher	27.7	13.9	11.2	19.1
Region***	% north	45.3	36.6	28.3	38.6
	% centre	21.0	19.6	18.7	20.0
	% south	33.7	43.8	53.0	41.4
Living arrangements***	% living alone	9.1	10.8	15.2	10.9
	% living with partner	87.8	84.4	78.5	84.7
	% living without a spouse and with other people	3.1	4.8	6.3	4.4
Work status***	% in the workforce	13.5	6.5	3.4	8.8
Subjective financial situation***	% economic resources of the family are considered at least adequate	71.7	61.7	45.1	62.6

Asterisks indicate statistically significant differences by health status: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

For grandmothers, both the frequency of contact with grandchildren and children is not significantly associated with the presence of health problems, but grandmothers' health status is strongly more influenced by contact with "peers" (siblings and friends), reducing the probability of having both mild and severe health problems. Moreover, as with grandfathers, we find a significantly higher risk of mild health problems for grandmothers having someone living nearby they can count on.

From the results of the models on self-rated health, we observe a similar effect for grandfathers and grandmothers of the independent variables on the likelihood of reporting poor or very poor health, but some differences in the likelihood of reporting fair health (rather than good or very good). For grandfathers, frequency of contact with children and grandchildren is not significantly associated with the self-perceived health status (there is only a weak association with a lower probability of reporting a poor/very poor instead of a good/very good health status for grandfathers who frequently see their grandchildren), while grandfathers who have at least weekly contact with siblings are significantly less likely to report a poor/very poor self-rated health status. The presence of friends they can count on is significantly associated with a lower probability of having poor/very poor self-rated health status, whilst the presence of neighbours they can count on is not significantly associated with the self-perceived health status.

Table 6 Descriptive characteristics of grandmothers ≥ 60 years by self-perceived health status (data are expressed as the percentage, except for age)

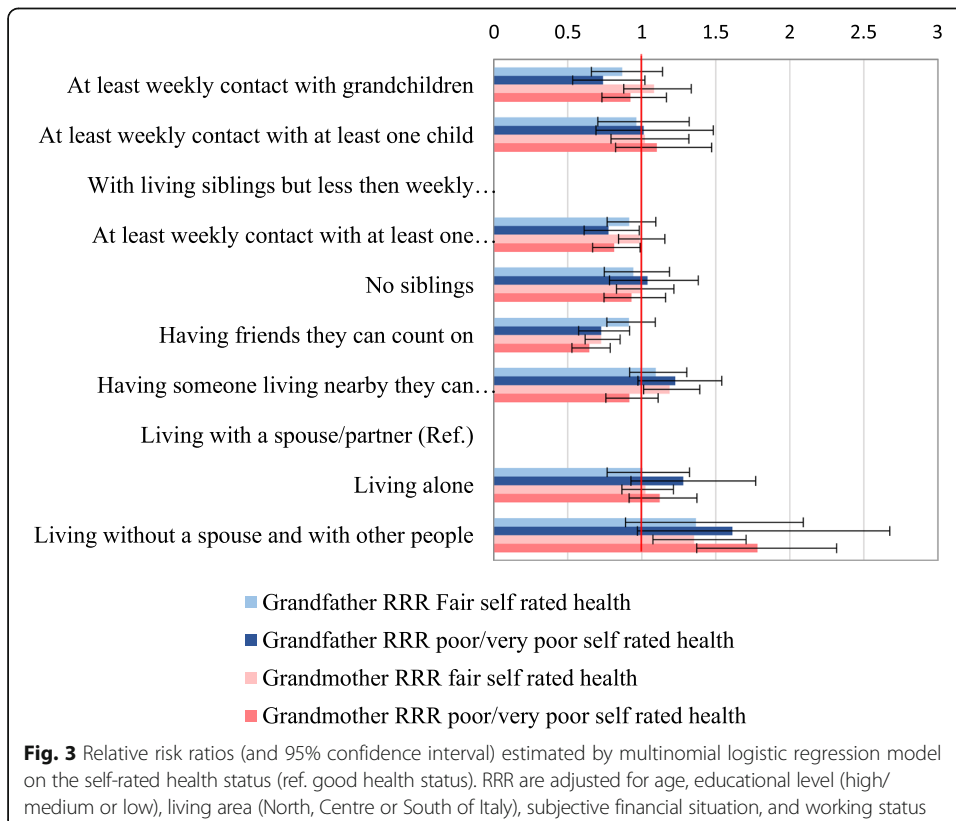
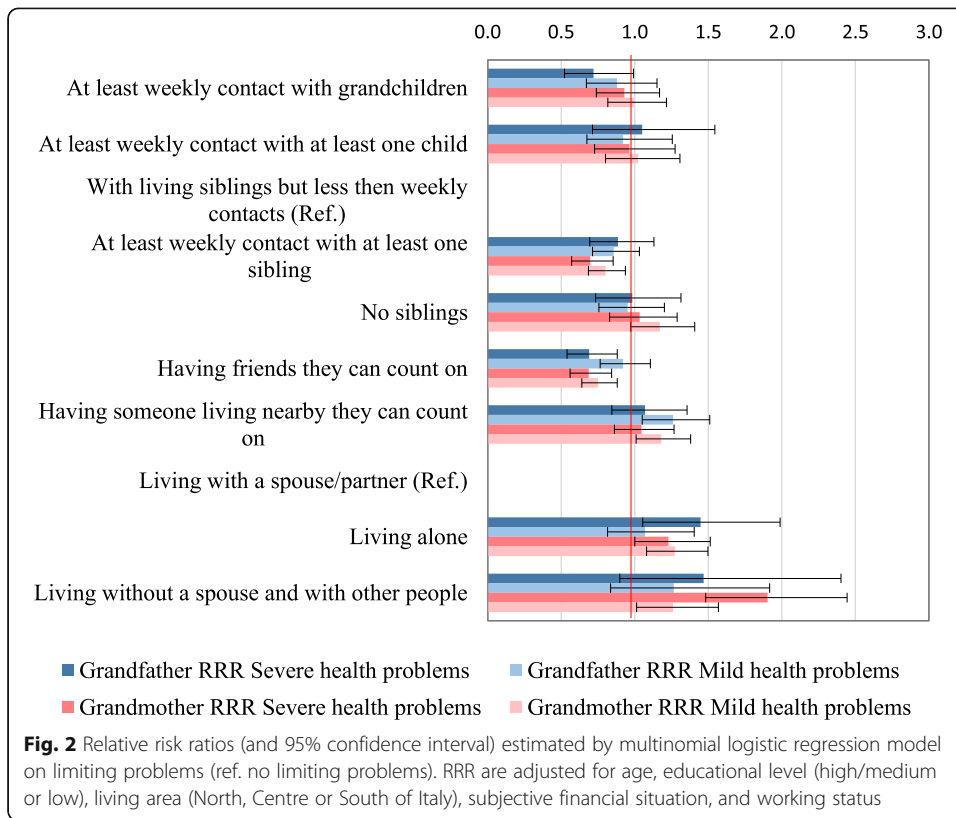
		Good/very good (N = 1513)	Fair (N = 1984)	Poor/very poor (N = 1127)	Total (N = 4624)
At least weekly contact with grandchildren***		82.4	80.8	75.3	80.0
At least weekly contact with children*		88.7	87.7	85.5	87.5
At least weekly contact with siblings***	% no siblings	19.3	21.5	25.1	21.6
	% having sibling but less than weekly contacts	42.6	42.9	46.5	43.7
	% at least weekly contacts	38.1	35.6	28.4	34.7
Social network	% having friends***	51.2	39.6	30.0	41.1
	% having someone living nearby they can count on in when in need***	52.8	51.7	42.8	49.9
Age***	Median age	69	74	78	73
Education***	% with a diploma or higher	18.7	9.1	5.8	11.4
Region***	% north	49.9	39.0	32.6	41.0
	% centre	20.5	19.2	20.1	19.8
	% south	29.6	41.8	47.3	39.2
Living arrangements***	% living alone	28.0	33.8	40.1	33.4
	% living with partner	61.8	51.1	39.1	51.7
	% living without a spouse and with other people	10.2	15.1	20.8	14.9
Work status***	% in the workforce	4.1	1.3	0.6	2.1
Subjective financial situation***	% economic resources of the family are considered at least adequate	69.8	57.8	45.0	58.6

Asterisks indicate statistically significant differences by health status: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

For grandmothers, the frequency of contact with children and grandchildren again is not significantly associated with self-rated health status while having at least weekly contact with siblings is slightly but nonetheless significantly associated with a lower likelihood of reporting a poor/very poor self-rated health status. The presence of friends they can count on is also significantly associated with a lower probability of having a poor/very poor or fair self-rated health status, whilst the presence of someone living nearby they can count on is significantly associated with a greater probability of grandmothers having a fair (but not a poor/very poor) health status rather than a good/very good one. Marginal effects at means show the same significant associations for grandfathers found with the RRR, while few associations are not significant for grandmothers such as having friends and living with others on fair self perceived health status. At the same time, always for grandmothers, living alone or with others are not significantly associated with having severe limitations compared to living with a spouse (tables in the Appendix) as found with the RRRs.

Discussion

Our work aimed to explore the relation between grandparental health (defined by the presence of long-term mild or severe limitations and with self-perceived health status) and contact simultaneously with the family and the social network. As in numerous



previous studies, we found few significant associations between health indicators and contact with the “vertical” network, while positive significant relations have been found with the “horizontal” network. We found no significant association between weekly contact with grandchildren with self-rated health status and absence of limiting health problems for grandmothers and a weak association for grandfathers with severe limiting illnesses (this effect disappears when calculating AME). Although this seems to be in contrast with positive associations found by some authors for mental health (e.g. Drew & Silverstein 2007, Drew & Smith 1999) and for wellbeing (e.g. Bordone & Arpino, 2016; Silverstein & Marengo, 2001), our results may be affected by “intergenerational ambivalence” in such relationships that we are not able to control in this study. It is possible that, unlike previous studies, our results benefit from a broader approach, so we are able to disentangle the different effects of overlapping social networks. Moreover, frequent contact between older people and their kin may be not associated with better health outcomes due to the ambiguous function of such contact: either older people see their children and receive positive benefits from it or they only see their children when health problems occur (as already noted by Reitzes & Mutran 2004). Finally, it should be noted that in Italy, the proportion of older parents seeing their children (and grandchildren) is usually higher compared to other Western countries (Tomassini et al. 2004), so it may be that frequent contact with vertical family members, that is, the generations above and below, is not associated with better health outcomes, as this is widely spread among older people and does not characterise particular associations. Additionally, as we do not control for grandchildren’s age, frequent contact with grandchildren may be related to childcare (in the case of younger grandchildren) or to family visits that are less demanding for grandparents (Geurts et al. 2009).

Consistent with previous studies (e.g. Rasulo et al. 2005, for siblings; Sabin 1993, for friends and O’Campo et al. 2015, for availability of help from the neighbourhood), when analysing contact with other members of the network, we found that grandparents are significantly less likely to report mild or severe limiting health problems or a poor/very poor health status when they have friends they can count on and when they have at least weekly contact with siblings. These associations have been found significant for both grandfathers and grandmothers (except for contact with siblings that, for men, is not significantly associated with the presence of functional limitations caused by health problems). The association between good health and the presence of friends which one can count on, is slightly stronger for women, as far as self-rated health is concerned. These results suggest that while the contacts from “vertical kinship” could reflect the provision of support enacted when in need, contacts with siblings or from the “friendship and neighbourhood network” instead are associated with positive health outcomes, when considering both objective or subjective indicators for health (i.e. functional limitations caused by health problems and self-rated health). Furthermore, older people are significantly more likely to report mild limiting health problems and, for women, a fair self-perceived health status when they have someone living nearby they can count on. Interestingly, all these associations hold even after controlling for a number of socio-economic indicators, once again confirming the positive action of “peer” ties on the health of older people (Sabin, 1993; Litwin & Shiovitz-Ezra 2006; Litwin & Stoeckel 2013).

Contrary to what is expected according to literature (e.g. Waite, 1995, Franks et al. 2006, Stephens et al. 2009), living with a spouse/partner presents no significant association with good and very good self-perceived health status for grandfathers. Living without a spouse and with other people, as expected, is significantly and negatively associated with poor health indicators, especially for grandmothers. Having considered a comprehensive approach may have reduced the positive effect of being married for men.

Finally, there are few differences between grandmothers and grandfathers. Frequent contact with siblings seems to be more associated with good indicators of health for women, while having friends to count on has the same beneficial association for both men and women, suggesting that Italian older grandparents have similar contact with selected members of the family and social network compared to other countries (Tomassini et al. 2004).

Our paper has several limitations. The most important relates to the cross-sectional nature of the survey used in this analysis that cannot provide any information to assess the direction of the associations found. A second major limitation is the use of structural indicators for the network without any information on the quality of the various relationships. Having frequent contact with children for example may be an indication of strong family solidarity, but at the same time, in a family-oriented country where most elderly care is provided by spouses and children, it may result from the support provided to the older generation when in need. Additionally, the survey does not provide information on where grandparents meet the various members of their network. It may be more likely that friends are met outside the home and therefore seeing them is an indicator of good health conditions because they are more mobile.

However, our work also has as a strong point the richness of data used in the analyses, which are collected through the Italian “Family and Social Subjects” survey. The survey has a very large sample size, and it records numerous data on relationships with different components of the family, friends and people living nearby the respondents can count on.

Indeed, only a few studies based in the European Mediterranean countries have simultaneously estimated the association between frequency and/or the type of contact; distinguishing between familiar contact, contact with children and grandchildren or contacts with siblings, friendship contact or neighbourhood contact on both subjective and objective health indicators of grandparents.

A result which particularly characterises Italy compared to studies based on the USA or Western European data is that men and women have similar associations between health and contact with their social network (Litwin, 2009). It may be that older Italian women are more “family-oriented” compared to their European or US counterparts resulting in less involvement in their social network. However, it may also be that men are part of their wives’ networks which results in no significant gender differences when associating health and interaction and social networks.

Conclusions

Separately but simultaneously considering and modelling the association between different aspects of the grandparental social network and different typologies of health outcomes, in a family-oriented culture such as Italy, sheds new light on the correlation between the social relationships and health in older people. The positive effects of

frequent interaction with vertical kinship (i.e. parents, children and grandchildren) and strong gender differences are questioned. These results demand more research on Southern European countries especially in a comparative perspective. Additionally, our study confirms the positive association of horizontal social ties (with relatives such as siblings, or with friends and neighbours) and the health of older people. This finding, in line with most of the studies on the topic, demands for a greater presence of questions on the horizontal network in quantitative surveys since it may represent a key dimension for understanding the wellbeing of older people now and potentially even more in the future.

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Authors' contributions

CT analysed and interpreted the results, contributed to the conception of the study and to the first draft of the manuscript. JZ performed the statistical analysis, contributed to both a first draft and a critical revision of the manuscript. CL contribute to the theoretical framework of the manuscript, and to a critical revision of the background. GC supervised the statistical analysis and contributed to both the study's analytic strategy and the first draft of the manuscript. All authors provided critical feedback and helped shape the research, analysis and manuscript. The authors read and approved the final manuscript.

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Availability of data and materials

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Competing interests

The authors declare that they have no competing interests.

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