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Childlessness, personal social networks and wellbeing at advanced ages: a cross-sectional study in a Southern European familistic welfare state

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Abstract

During the past decades, childless old age has attracted a considerable amount of scholarly interest. However, few studies address this phenomenon in Southern European familistic welfare states, where there is a pervading expectation that family members, especially spouses and children, care for their older relatives. The present cross-sectional study aims to analyse the relationship between childlessness, social networks and wellbeing in a sample of 612 Portuguese individuals aged 65 and over, comprising two sub-samples: parents (N = 540) and childless (N = 72). Data were collected through a research protocol that included a sociodemographic questionnaire, a personal social network assessment inventory, and several validated psychometric measures of psychological wellbeing focusing on mental health, loneliness, depression and satisfaction with life. Childless older adults' social networks are smaller but more diverse, including a more significant proportion of friends and neighbours. No differences were found in perceived support from significant others, but network reciprocity was lower among non-parents. The childless subsample also reported more feelings of loneliness and less life satisfaction, but regression analysis showed that parenthood status, *per se*, is not significantly related to any outcome measures. Besides the central role of sociodemographic characteristics and personal functioning measures in explaining psychological wellbeing variance, several network factors were also identified as influential predictors. Implications for micro-level network intervention and macro-level social policy making are discussed.

Keywords: childlessness; familism; ageing; personal social networks; wellbeing

Introduction

Intergenerational relationships are commonly associated with parent–child support exchange, which reverses its flow as parents age. A common hypothesis in the literature is that when parents become older and frailer, the support they provide to

adult offspring declines, and the support they receive increases. This hypothesis of flow reversal has been criticised (Kalmijn, 2019), but adult children nonetheless tend to have an essential role in providing family support to older parents (McGarry, 1998; Laditka and Laditka, 2001). However, what happens when there are no children? What are the consequences when these privileged sources of social contact and support in old age are absent? Krenkova (2019: 26) points out that when scholars tackle this issue, they often ‘wonder whether childless people will end up on the margins of society, potentially lacking social contact or needing assistance when faced with deteriorating health’. During the last two decades, the topic of childlessness has attracted more attention from researchers (Krenkova, 2019). However, despite these developments, the literature is still scarce about older people who do not have these intergenerational linkages in Southern European societies with familistic welfare systems (Albertini and Mencarini, 2014).

In Portugal, during a brief span of 25 years (1994–2019), there was a 54 per cent increase in childless couples of all ages, representing 42.4 per cent of all couples and 24.8 per cent of households in 2019 (Pordata, 2020). Nevertheless, childlessness is not a new phenomenon in Portugal. As a recent broad overview of fertility trends for women born between 1900 and 1972 in 30 European countries showed, the pattern of childlessness in Portugal over the past century was U-shaped and similar to other European countries (Sobotka, 2017). Childlessness levels were 27.2 per cent for the 1900 cohort, steadily declined until reaching a minimum of 9.8 per cent during the 1950s, and from this point forward, the proportion of childless women rose again, albeit with a less pronounced curve than other Southern European countries, reaching 12.3 per cent among those born in 1968.

The rising numbers of childless older adults have impacts on social protection systems and may cause imbalances in service access and use (Krenkova, 2019), especially in those countries with a more robust cultural emphasis on family ties, where there is a(n) (un)spoken expectation that informal family support must fill the gaps and shortages of formal support services (Saraceno, 2010; Albertini and Mencarini, 2014). As Albertini and Mencarini (2014) point out, increasing rates of childlessness will lead to an increased demand for public/formal long-term care services, and this might put a significant strain on a ‘weak welfare-state’ (Santos, 1993), such as Portugal, where social services for older people remained largely underdeveloped during the past century, and social protection was essentially centred on income support through the pension system, and health care through the national health system (World Health Organization (WHO), 2020). Policy developments to formalise, strengthen and extend social services for older people date back to the 1980s, and one of the most significant and prominent measures emerged in 2006 with the implementation of the National Network for Long-term Integrated Care (Lopes *et al.*, 2018; WHO, 2020). This measure aimed to provide universal coverage for people with physical/cognitive limitations that require continuous social support and/or health monitoring, and was organised in two main settings: home and community-based services and nursing homes (Lopes *et al.*, 2018). Despite its achievements and steady growth, financial constraints seem to have hampered its development, and issues such as the predominance of institutionalisation over home care, long waiting lists or regional

asymmetries in service accessibility (Lopes *et al.*, 2018) highlight the weaknesses and gaps of the formal care provision system.

As a familistic welfare state, Portugal is characterised by a pervading ideological assumption that families have significant caring responsibilities and that state interventions only come to the fore when family members exhaust their capacity to support each other (Wall *et al.*, 2001; Sousa and Figueiredo, 2004; Tavora, 2012). The emphasis placed on the informal care sector in Portugal is illustrated by recent data from the Portuguese National Institute for Statistics (Statistics Portugal, 2020), indicating that approximately 10 per cent of the resident population (estimated at ten million) provides some form of informal support, of whom 65.37 per cent are women. The relevance of welfare provision from informal relationships, namely from family relations (in particular women), extends to Portuguese older and dependent people (Pego and Nunes, 2018). In this sense, despite the aforementioned efforts made by policy makers during recent decades in establishing a network of long-term care provision services, reliance on families and unpaid care-givers persists, as care for older people continues to be understood as a family responsibility (Lopes, 2016; WHO, 2020). Regarding family carers of older persons, research findings compiled in the EUROFAMCARE report (Sousa and Figueiredo, 2004) allow the identification of two major groups: (a) those aged 65 or more, usually the spouse (approximately 20% of all family carers) and (b) those in the 45–55 age range, usually daughters or daughters-in-law (approximately 64% of all family carers). A recent study conducted with data from the fourth wave of the Survey of Health, Ageing and Retirement in Europe (SHARE) (Pego and Nunes, 2018) suggests that it is the absence of a spouse that determines resorting to someone from outside the household, and children usually deliver this outside care (38.66% of all informal carers not living with the care recipient). Also, even though inside care-givers (those living in the care recipient's household) tend to be spouses (55.5%), adult children still comprise a significant percentage of this group (24.2%). Other types of relations also emerge as informal care-givers, such as neighbours, friends and housekeepers. However, overall the research findings suggested a marked gendered and familistic trend regarding the informal care provision to older people in Portugal, with spouses and adult children (primarily women) assuming a significant role in older adults' solidarity networks (Pego and Nunes, 2018).

These familistic macro-social trends frame the micro-social experiences of Portuguese older adults. For example, a recent study focusing on personal social networks in later life found that 61.8 per cent of respondents present family-focused networks, comprised almost exclusively (94.68%) of kinship ties (Guadalupe and Vicente, 2020). In another Portuguese study about social networks of trust (Cabral *et al.*, 2013), 76.0 per cent of respondents aged 50+ described predominantly familial networks, usually including spouses and children. These were associated with higher levels of satisfaction with network members, emotional and counselling support. On the other hand, predominantly non-family networks were connected with engagement in informal groups and diversified outdoor and indoor activities.

In the past decades, research focused on the social milieu of Portuguese older adults has significantly increased, but studies that address childless old age are still limited. Côca *et al.* (2015) analysed the personal social networks and quality

of life of childless Portuguese older adults, but the absence of a comparison group was a significant limitation, and the generalisability of results was restricted due to the small sample size. Nonetheless, this study already suggested essential differences in non-parents' networks, especially when compared to data from the general older adult population (e.g. Guadalupe and Vicente, 2020), with friends assuming a more prominent role, both in the network structure (where they outnumber family members) and in the provision of support. Childless older people reported robust, medium-sized networks, cohesive and reciprocal, with moderate levels of perceived support; but their average scores on the quality of life scale were similar to those found in adults with a disease or impairment (Côca *et al.*, 2015), suggesting a negative relationship between childlessness and wellbeing in old age.

These results align with Krenkova's (2019) structured literature review on childless old age, social networks, support and wellbeing. This review included 33 articles published between 2000 and 2018, and although no overall consensus was found, some findings frequently emerged: (a) older non-parents have smaller and more-diverse networks, less contact with family members, but more with friends and neighbours; (b) social loneliness is more prevalent among childless older adults, despite the higher probability of community participation; (c) childless older adults are more likely to report lack of support, especially when suffering from poor health and in countries with inadequate provisions of formal social care; (d) non-parents have a higher probability of resorting to formal support services, as their social networks appear to be less effective in providing intensive care; and (e) some sociodemographic (e.g. sex) and cultural context (e.g. tolerant attitudes towards childlessness) variables appear to account for variation on childless older adults' wellbeing and opportunities.

One limitation that Krenkova (2019) found in the literature was that researchers tended to treat non-parents as a homogeneous group (usually because of the low numbers of childless older adults in the samples), ignoring potential within-group differences, such as those between voluntary and involuntary childlessness. Therefore, these results should be pondered and framed within the contemporary diversity and complexity of life pathways and family structures, bearing in mind that parenthood does not necessarily correspond to children's availability in old age. For example, current trends in adult children's mobility/migration and parental divorce may have detrimental effects on parent-child relations and the support offspring provide to their ageing parents (Kanaiaupuni, 2000; Shapiro and Cooney, 2007; Guo *et al.*, 2009).

It should be noted that the articles under review in Krenkova's (2019) study provided data from a wide range of countries, including familistic Southern European (e.g. Spain and Italy) and Asian countries (e.g. China), which allowed the author to underscore the importance of sociocultural context in shaping the experience and consequences of not having children (Umberson *et al.*, 2010; Krenkova, 2019). For example, in a study comprising 24 European countries, Huijts *et al.* (2013) found that disadvantages in the psychological wellbeing of non-parents were smaller in countries with more tolerant norms on childlessness. Another study in 12 European countries showed that childlessness was more strongly associated with later-life loneliness in countries that had more traditionalist values (Zoutewelle-Terovan and Liefbroer, 2018). However, lack of consensus and even

conflicting findings were frequently reported by Krenkova (2019), particularly in the relation between childlessness and psychological wellbeing. For example, Zhang and Liu (2007) found that childlessness was significantly related to life satisfaction, anxiety and loneliness, and Chou and Chi (2004) reported significant associations with loneliness and depression. But Zhang and Hayward (2001) also found that not having children did not increase the prevalence of loneliness at advanced ages. These inconsistent results highlight the complexity of the childless/child-free 'issue', specifically its association with psychological wellbeing, underscoring the need for further research (Krenkova, 2019).

Current study

The present comparative and cross-sectional study aimed to analyse personal social networks and measure selected wellbeing variables (mental health, loneliness, depression, satisfaction with life) of older individuals embedded in a familistic culture according to the (non-)existence of offspring. This study also aimed to examine the relationship of sociodemographic characteristics, childlessness and network characteristics to measures of wellbeing. It thus intended to contribute to the knowledge about interpersonal networks and social support in this population, discussing implications for practice and future research endeavours, as well as challenges for social policy.

Methods

Procedure

This is a cross-sectional study with non-probabilistic, snowball and convenience sampling procedures. Data were collected through interviews based on a structured questionnaire detailed below. These interviews were carried out in person by data collectors who underwent a brief course addressing the research protocol objectives and guidelines for correct administration. Data collection was primarily conducted in Portugal's centre region between 2012 and 2015. Institutions that provide some form of support for older people were contacted (*e.g.* daycare centres), but a substantial part of the sample was collected through snowball or chain-referral sampling procedures. Data collectors identified and contacted potential participants living in the community, provided information on the purpose of the investigation and requested their informed consent. After applying the research protocol, data collectors asked participants to voluntarily nominate other subjects who met inclusion criteria.

The United Nations' definition of old age for developed countries (65 and over) was used as an inclusion criterion. Only respondents who lived in Portugal and were able to provide autonomous responses were included. All participants understood the study's purposes, were volunteers and signed an informed consent form.

Instruments

Basic sociodemographic data were collected through a questionnaire survey. This questionnaire included two questions from the WHOQOL-Bref (Vaz Serra

et al., 2006; Canavarró *et al.*, 2007) which focused on satisfaction with general health and subjective assessment of mobility, recorded on a five-point Likert scale. Together with a multiple-choice question regarding social services' usage (the options were: home support service; seniors' community centre; daycare centre; overnight care; nursing/care home), these constituted the three measures of personal functioning used in this study.

Participants' networks were assessed through the Personal Social Network Assessment Inventory (Guadalupe, 2016) based on the conceptual framework of Sluzki (2010). This multi-dimensional inventory starts with a probe question in which respondents are asked to name all the persons that are meaningful to them and provide some support. After completing this task, respondents are requested to provide additional information about each network member. Network variables were grouped in three categories: (a) structural, (b) functional, and (c) relational-contextual. Structural variables include network size (total count of network members), composition (proportion of each of the following relational categories: family, friends, neighbours, workplace and institutional relations) and density (the proportion of network members that knows one another; calculated by dividing the number of actual connections between network members by the number of potential connections, multiplied by 100; ranges from a minimum of 0, where there are no dyadic connections whatsoever between network members, to a maximum of 100, where all network members know each other). Functional variables refer to the degree of perceived support from network members (emotional, instrumental, informational, companionship and access to new contacts), measured on a three-point scale (1 = 'none'; 2 = 'some'; 3 = 'a lot'); and reciprocity, scored on a four-point scale (ranges from 1 = 'does not provide support to any of the network members' to 4 = 'provides support to most of the network members'). Relational-contextual variables include the duration of ties (proxy measure of network stability, measured in years), frequency of contacts (measured on an ordinal scale: 1 = 'a few times per year', 2 = 'a few times per month', 3 = 'weekly', 4 = 'a few times per week', 5 = 'daily') and residential proximity (also measured on an ordinal scale: 1 = 'more than 50 kilometres (km)'; 2 = 'less than 50 km'; 3 = 'in the same city/village'; 4 = 'in the same street/neighbourhood'; 5 = 'in the same house'). Even though the Personal Social Network Assessment Inventory (Guadalupe, 2016) is a powerful tool that combines different theoretical approaches to the delineation of social networks (Van der Poel, 1993; Litwin, 1995), such as the exchange approach (the supportive content of ties with each network member is evaluated), the affective approach (the probe question allows respondents to use subjective criteria to determine who are the most important or meaningful people in their lives), the role relation approach (the relationship of each network member to the respondent is classified in five major relationship categories: family, friends, neighbours, workplace and institutional relations) and the interaction approach (the frequency of contacts between the respondent and each network member is addressed), it does have certain limitations. We should note that the inventory does not discriminate the role of spouse and adult children within the family relationship category and, therefore, we were not able to assess if respondents with children and/or spouses actually include them in their networks.

Finally, the research protocol included the following four measures of wellbeing.

Mental Health Inventory-5 (MHI-5)

The MHI-5 is a self-report questionnaire with five items and a Likert-type response with six positions. It is a brief, reliable and valid version of the original 38-item questionnaire aimed at evaluating mental health in epidemiological research, from both a positive and negative point of view. The total score ranges from 0 to 100, with higher values indicating better mental health. The translation and adaptation of the Portuguese version of the Mental Health Inventory (Ribeiro, 2001) showed a 0.95 correlation between the short and long versions, and its properties were similar to those of the original version. Internal reliability analysis yielded a Cronbach's α coefficient of 0.87 in this sample.

UCLA Loneliness Scale

The Portuguese adaptation of the UCLA Loneliness Scale (Russell *et al.*, 1980; Neto, 1989) is an 18-item scale designed to measure subjective feelings of loneliness and social isolation. Responses are recorded on a four-point scale, ranging from 'never' to 'often'. Total scores range from a minimum of 18 to a maximum of 72. Higher scores indicate a greater expression of loneliness. The translation and validation of the Portuguese version of this instrument revealed adequate internal consistency ($\alpha = 0.87$) and concurrent validity (correlation between the scale's total score and respondents' self-assessment of loneliness and other emotional states) (Neto, 1989). The Cronbach's α coefficient in this study was 0.86.

Geriatric Depression Scale Short Form (GDS-15)

The GDS-15 is a short version of the original Geriatric Depression Scale (Yesavage *et al.*, 1982–1983) with 15 items aimed at assessing depressive symptoms in various settings. Higher scores reflect more severe symptoms. This short version uses dichotomous, yes/no questions, and the literature reports reliability values around 0.80 (Almeida and Almeida, 1999a). The Portuguese version used in this study was developed by Almeida and Almeida (1999a, 1999b), who found test–retest reliability (Almeida and Almeida, 1999b) and good internal consistency (Almeida and Almeida, 1999a). The authors also found that the GDS-15 was a reliable screening instrument for major depression according to ICD-10 (International Classification of Diseases, 10th revision) and DSM-IV (*Diagnostic and Statistical Manual of Mental Disorders*, 4th edition), and a reliable measure of the severity of depressive episodes (Almeida and Almeida, 1999a). Recent data on the psychometric properties of the Portuguese version of the GDS-15 was reported by Matos *et al.* (2019). The authors found that the scale presented good internal consistency ($\alpha = 0.85$) and discriminant validity (the global score differentiated individuals with emotional disorders) (Matos *et al.*, 2019). Consistent with these previous results, the internal reliability analysis of this measure yielded a Cronbach's α coefficient of 0.82.

Satisfaction With Life Scale (SWLS)

Initially developed by Diener *et al.* (1985), the SWLS was designed to measure global cognitive judgements of one's life satisfaction and is one of the satisfaction scales most used in research (Sancho *et al.*, 2014). The Portuguese version

(Simões, 1992) used in this study uses a five-point Likert-type response format. Scores are converted to an index of 0–100, with higher values indicating greater life satisfaction. More recent data on the reliability and validity of the Portuguese SWLS were presented by Reppold *et al.* (2019): the uni-dimensionality of the scale was confirmed, internal consistency was adequate ($\alpha = 0.77$) and evidence of criterion validity was found. In our study, a Cronbach's α coefficient of 0.84 suggests acceptable reliability.

Participants

The final survey sample included 612 individuals aged between 65 and 98 (mean = 75.6, standard deviation = 7.6). Respondents were more likely to be women (63.1%), married (52.2%) or widowed (36.1%) (7.2% were never married and 4.2% were divorced/separated). Educational attainment in the sample was relatively low, with 51.3 per cent of the respondents reporting the completion of the fourth school year, which corresponds to the first cycle of the Portuguese educational system. In terms of housing arrangements and income, 78.8 per cent share their residence with at least other person (21.2% live alone) and 54.2 per cent report an income that meets living costs but does not allow saving (it should be noted that 22.1% report incomes that do not cover monthly expenses). A significant proportion of the sample (27.9%) reported being a user of social support services.

The sample comprises 540 (88.2%) individuals with at least one child and 72 (11.8%) childless. In the childless subsample, the proportion of women and never-married individuals was higher. Childless respondents were also more likely to live alone and receive social services support, including residential care. No statistically significant differences between subsamples were found regarding age, income, educational attainment, general health satisfaction and subjective mobility assessment (Table 1). As stated earlier, the Personal Social Network Assessment Inventory did not allow the identification of adult children or spouses in respondents' networks (when respondents included them, they were simply registered as family relations). As such, it is possible that some respondents in the parents subsample do not include their children in the pool of significant others due to estrangement or geographic distance, among others. However, considering the large size of this subsample, it is expected that these cases are diluted when calculating network variables' and wellbeing measures' average scores.

Data analysis

All statistical analysis was performed using SPSS v26 (IBM SPSS Statistics). Frequency distributions and measures of central tendency were calculated for each variable. Chi-square goodness-of-fit tests were used to check if there were significant sociodemographic differences between subsamples. Average score differences in social network and wellbeing variables were assessed with Student's *t*-test and one-way analysis of variance (followed by Tukey's *post hoc* tests). Correlations between these two sets of variables were analysed with Pearson's *R*. Considering the limitations of *p* values to evaluate the differences between means, we also calculated the effect size by Cohen's *d* (<0.19 insignificant;

Table 1. Sociodemographic and functional characteristics of the subsamples

	Childless		Parents		<i>t</i>	χ^2	<i>p</i>
	N = 72 (11.8%)		N = 540 (88.3%)				
	N	%	N	%			
Sociodemographic variables:							
Mean age (SD)	75.53 (8.38)		75.56 (7.50)		−0.037		0.971
Sex:							
Male	15	20.8	211	39.1		9.075	0.003
Female	57	79.2	329	60.9			
Marital status:							
Single	40	55.6	4	0.7		286.070	<0.001
Married/divorced/widowed	32	44.4	536	99.3			
Income:							
Does not cover expenses	13	18.1	122	22.6		1.118	0.572
Covers expenses/break-even point	43	59.7	289	53.5			
Allows saving	16	22.2	129	23.9			
Education:							
Illiterate	15	20.8	71	13.1		5.458	0.487
No level of schooling	12	16.7	92	17.0			
4 years	36	50.0	278	51.5			
6 years	2	2.8	24	4.4			
9 years	1	1.4	31	5.7			
12 years	2	2.8	13	2.4			
Higher education	4	5.6	31	5.7			
Household:							
Living alone	28	38.9	102	18.9		15.190	<0.001
Co-habiting	44	61.1	438	81.1			
Personal functioning variables:							
Social services' support:							
Without support	37	51.4	404	74.8		20.517	<0.001
With support	20	27.8	95	17.6			
Living in institution	15	20.8	41	7.6			
Mean general health satisfaction (SD)	3.17 (1.04)		2.98 (1.07)		1.401		0.162
Mean subjective assessment of mobility (SD)	3.22 (1.10)		3.32 (1.13)		−0.692		0.489

Note: SD: standard deviation.

0.20–0.49 small; 0.50–0.79 medium; 0.80–1.29 large; >1.30 very large) and eta-squared (0.01 small effect; 0.06 medium effect; 0.14 large effect) (Cohen, 1988; Rosenthal, 1996; Pallant, 2002). Finally, stepwise multiple regressions were used to determine the influence of sociodemographic and network characteristics on wellbeing scores.

Results

As shown in Table 2, the social networks of childless individuals differ essentially on structural variables. Their networks tend to be smaller, less focused on family relations, with a higher proportion of friendships, neighbours and institutional relations. However, it should be noted that standard deviation values point to a wide diversity in network size and composition for both parents and childless individuals. The (non-)existence of children seemed to be not so relevant when

Table 2. Personal social networks according to the (non-)existence of offspring

	Childless (N = 72)		Parents (N = 540)		<i>t</i>	<i>p</i>	<i>d</i>
	Mean	SD	Mean	SD			
Structural variables:							
Average size	6.24	5.41	8.13	5.17	−2.896	0.004	0.36
Density	94.75	14.41	96.02	11.14	−0.875	0.382	
Composition (proportion):							
Family	48.38	37.13	79.61	24.11	−9.589	<0.001	1.00
Friends	24.82	31.28	11.23	18.08	5.396	<0.001	0.53
Neighbours	18.02	28.99	6.49	13.86	5.617	<0.001	0.51
Workplace	0.79	6.73	0.62	4.22	0.302	0.763	
Institutional relations	8.00	21.68	2.06	8.97	2.297	0.024	0.36
Functional variables:							
Emotional support	2.55	0.42	2.65	0.37	−1.869	0.065	
Instrumental support	2.20	0.63	2.22	0.54	−0.159	0.874	
Informational support	2.29	0.55	2.38	0.48	−1.428	0.154	
Companionship support	2.34	0.49	2.33	0.46	0.184	0.854	
Access to new contacts support	2.09	0.70	2.21	0.59	−1.340	0.184	
Reciprocity	2.85	1.07	3.40	0.90	−4.162	<0.001	0.56
Relational-contextual variables:							
Duration of ties	40.99	15.42	39.63	10.90	0.713	0.478	
Frequency of contact	3.97	1.08	3.85	0.88	0.882	0.380	
Residential proximity	3.37	0.98	3.18	0.88	1.680	0.094	

Table 3. Measures of wellbeing according to the (non-)existence of offspring

	Childless (N = 72)		Parents (N = 540)		<i>t</i>	<i>p</i>	<i>d</i>
	Mean	SD	Mean	SD			
Mental health (MHI-5)	56.06	21.32	58.32	22.09	−0.821	0.412	
Loneliness (UCLA)	34.39	8.83	32.19	8.06	2.148	0.032	0.26
Depression (GDS-15)	4.93	4.20	4.90	3.70	0.062	0.950	
Satisfaction with life (SWLS)	15.55	4.69	16.89	4.63	−2.282	0.023	0.29

Notes: SD: standard deviation. MHI-5: Mental Health Inventory-5. UCLA: UCLA Loneliness Scale. GDS-15: Geriatric Depression Scale Short Form. SWLS: Satisfaction With Life Scale.

differentiating social networks on their functional and relational-contextual properties. In these two subsets of variables, only reciprocity differed, with parents reporting higher reciprocity levels with their network members.

As may be seen in [Table 3](#), two of the four measures of wellbeing are related to the (non-)existence of offspring, even though the effect sizes are small. Childless individuals report more loneliness and less satisfaction with life, but no differences were found in mental health and depression scores. Our next step was to determine correlations between network variables and wellbeing measures to ascertain if some of the distinctive characteristics of childless individuals' social networks could be related to these unfavourable outcomes.

However, instead of clarifying this issue, the correlations between these variables made the picture more complex. As summarised in [Table 4](#), the most statistically significant correlations were found in the network functional variables. Higher levels of support from network members are associated with better outcomes in mental health, loneliness, depression and satisfaction with life. Relational-contextual variables also presented statistically significant associations with some outcome measures, but the magnitude of correlations suggests weak or small associations. Regarding structural variables, only a small number of composition categories were significantly related to outcome measures: a higher proportion of family members was related to less loneliness; greater emphasis on neighbourhood relations was associated with less satisfaction and more loneliness. The proportion of institutional relations in the network was negatively associated with all outcome measures. The magnitude of these correlations also points to weak or small associations.

In this sense, if we consider that 'childless' and 'parents' networks differ mainly at the structural level, then the absence of children does not seem to induce more vulnerable personal social networks.

These results led to additional data analysis, incorporating a variable that might help understand the complex relationship between childlessness, social networks and wellbeing: living arrangements (living alone or co-habiting with someone). Research shows that living alone in old age has detrimental effects on subjective wellbeing, including perceived financial comfort and social isolation (Steppler, 2016). Also, older adults living alone are less likely than those who live with others

Table 4. Relationship of network variables and measures of wellbeing

	Mental health (MHI-5)	Loneliness (UCLA)	Depression (GDS-15)	Satisfaction with life (SWLS)
Structural variables:				
Average size	−0.032	−0.070	−0.019	0.009
Density	−0.034	−0.047	−0.005	−0.032
Composition (proportion):				
Family	0.041	−0.134**	−0.020	0.076
Friends	0.014	−0.25	−0.055	0.042
Neighbours	−0.040	0.144**	−0.011	−0.135**
Workplace	0.039	0.011	−0.054	0.042
Institutional relations	−0.081*	0.156**	0.092*	−0.080*
Functional variables:				
Emotional support	0.070	−0.241**	−0.55	0.160**
Instrumental support	0.110**	−0.129**	−0.125**	0.035
Informational support	0.207**	−0.273**	−0.236**	0.217**
Companionship support	0.196**	−0.264**	−0.193**	0.143**
Access to new contacts support	0.197**	−0.213**	−0.248**	0.165**
Reciprocity	0.190**	−0.339**	−0.227**	0.278**
Relational-contextual variables:				
Duration of ties	−0.011	−0.104*	−0.009	0.056
Frequency of contact	0.086*	−0.050	−0.063	0.049
Residential proximity	0.106**	−0.034	−0.098*	0.052

Notes: MHI-5: Mental Health Inventory-5. UCLA: UCLA Loneliness Scale. GDS-15: Geriatric Depression Scale Short Form. SWLS: Satisfaction With Life Scale.

Significance levels: * $p < 0.05$, ** $p < 0.01$.

to be in contact with their children and grandchildren, and to say they spend more time with their family as they age (Stepler, 2016).

In Table 5, we can see that the social networks of those who live alone share some similar features to childless individuals' networks, namely less emphasis on family relations and a higher proportion of friends and neighbours, when compared with co-habiting individuals' networks. However, contrary to the pattern observed while comparing 'childless *versus* parents' networks, 'living alone' networks are characterised by lower levels of all types of support and perceived reciprocity when compared to 'co-habiting' networks.

Table 6 details the average scores for wellbeing according to the combination of childlessness and living alone. Childless individuals who live alone present the

Table 5. Personal social networks and living alone

	Living alone (N = 130)		Co-habiting (N = 482)		<i>t</i>	<i>p</i>	<i>d</i>
	Mean	SD	Mean	SD			
Structural variables:							
Average size	7.65	4.89	7.97	5.32	−0.632	0.528	
Density	94.82	11.93	96.15	11.46	−1.161	0.246	
Composition (proportion):							
Family	64.59	32.66	79.00	25.56	−4.662	<0.001	0.49
Friends	17.49	23.64	11.57	19.44	2.625	0.009	0.27
Neighbours	14.84	25.29	5.96	12.98	3.869	<0.001	0.44
Workplace	0.47	5.02	0.69	4.46	−0.483	0.629	
Institutional relations	2.62	10.99	2.80	11.48	−0.161	0.872	
Functional variables:							
Emotional support	2.57	0.40	2.66	0.37	−2.428	0.015	0.23
Instrumental support	2.02	0.55	2.27	0.54	−4.719	<0.001	0.46
Informational support	2.26	0.50	2.39	0.48	−2.838	0.005	0.27
Companionship support	2.21	0.46	2.36	0.46	−3.312	0.001	0.33
Access to new contacts support	2.06	0.57	2.23	0.61	−2.875	0.004	0.29
Reciprocity	3.13	1.02	3.39	0.91	−2.585	0.010	0.27
Relational-contextual variables:							
Duration of ties	39.82	12.67	39.78	11.19	0.031	0.976	
Frequency of contact	3.70	0.88	3.91	0.91	−2.293	0.022	0.23
Residential proximity	2.85	0.72	3.30	0.91	−5.905	<0.001	0.55

Note: SD: standard deviation.

highest average score of loneliness and one of the highest scores of depression, besides having the lowest mean value for the satisfaction with life measure. Parents who live alone have the lowest average score for the mental health measure and the highest mean value on the depressive symptomatology scale. There are statistically significant differences between groups for all wellbeing measures, but these are quite small (the effect sizes, calculated using eta-squared, range between 0.014 and 0.028). Tukey's *post hoc* tests allowed us to clarify which groups differ: in the MHI-5 and GDS-15 statically significant differences were found between 'parents living alone' and 'parents co-habiting'; in the UCLA Loneliness Scale, the groups that differed were 'childless living alone' and 'parents co-habiting'; finally, in the SWLS, differences were found between 'childless living alone' and the remaining three groups.

Table 6. Measures of wellbeing, childlessness and living alone

	Childless				Parents				<i>F</i>	<i>p</i>	η^2
	Living alone (N = 28)		Co-habiting (N = 44)		Living alone (N = 101)		Co-habiting (N = 438)				
	Mean	SD	Mean	SD	Mean	SD	Mean	SD			
MHI-5	56.00	17.25	56.09	23.74	52.08	22.31	59.76	21.81	3.609	0.013	0.018
UCLA	37.04	9.11	32.70	8.32	33.05	7.85	31.99	8.10	3.636	0.013	0.018
GDS-15	5.44	4.24	4.61	4.19	5.82	3.71	4.68	3.68	2.826	0.038	0.014
SWLS	42.14	16.86	59.65	24.67	56.13	22.22	60.19	23.33	5.906	0.001	0.028

Notes: SD: standard deviation. MHI-5: Mental Health Inventory-5. UCLA: UCLA Loneliness Scale. GDS-15: Geriatric Depression Scale Short Form. SWLS: Satisfaction With Life Scale.

Table 7. Variables most associated with wellbeing measures

Background variables	R^2	β	Network variables	R^2	β
Mental health:					
Sociodemographic:			Structural:		
Sex	0.025	−0.142 (0.000)	(None)		
Income	0.034	0.157 (0.000)	Functional:		
Personal functioning:			Companionship	0.017	0.125 (0.000)
General health	0.225	0.340 (0.000)	Relational-contextual:		
Mobility	0.014	0.145 (0.000)	(None)		
Total $R^2 = 0.315$, Adjusted $R^2 = 0.309$, $F = 55.035$ (0.000)					
Loneliness:					
Sociodemographic:			Structural:		
Age	0.012	0.091 (0.018)	Average size	0.009	−0.147 (0.000)
Sex	0.011	0.083 (0.019)	% of neighbours	0.011	0.124 (0.001)
Personal functioning:			Functional:		
General health	0.055	−0.152 (0.000)	Emotional	0.025	−0.111 (0.010)
Mobility	0.005	−0.099 (0.029)	Instrumental	0.010	0.132 (0.005)
			Informational	0.005	−0.140 (0.003)
			Companionship	0.011	−0.156 (0.001)
			Reciprocity	0.115	−0.161 (0.000)
			Relational-contextual:		
			Duration of ties	0.010	−0.128 (0.001)
Total $R^2 = 0.279$, Adjusted $R^2 = 0.264$, $F = 19.118$ (0.000)					

(Continued)

Table 7. (Continued.)

Background variables	<i>R</i> ²	β	Network variables	<i>R</i> ²	β
Depression:					
Sociodemographic			Structural:		
Age	0.012	0.117 (0.001)	(None)		
Sex	0.007	0.082 (0.013)	Functional:		
Income	0.026	−0.155 (0.000)	Informational	0.019	−0.134 (0.000)
Personal functioning			Relational-contextual		
General health	0.259	−0.330 (0.000)	(None)		
Mobility	0.052	−0.189 (0.000)			
Total <i>R</i> ² = 0.375, Adjusted <i>R</i> ² = 0.368, <i>F</i> = 59.680 (0.000)					
Satisfaction with life:					
Sociodemographic			Structural:		
Income	0.055	0.217 (0.000)	% of neighbours	0.009	−0.101 (0.005)
Living alone/co-habiting	0.005	0.073 (0.028)	Functional:		
Personal functioning			Emotional	0.014	0.110 (0.006)
General health	0.145	0.216 (0.000)	Instrumental	0.009	−0.198 (0.000)
Mobility	0.016	0.166 (0.000)	Informational	0.014	0.164 (0.000)
			Reciprocity	0.039	0.119 (0.002)
			Relational-contextual:		
			Duration of ties	0.006	0.077 (0.028)
Total <i>R</i> ² = 0.312, Adjusted <i>R</i> ² = 0.301, <i>F</i> = 26.952 (0.000)					

In the next step of data analysis, we carried out stepwise multiple regression on the various wellbeing measures to clarify the degree to which the sociodemographic and network variables account for variations in the scores. Besides the (non-)existence of children, we included all the sociodemographic variables described in Table 1 and the various structural, functional and relational-contextual network variables.

As seen in Table 7, the most influential factors that explain some degree of variation in all wellbeing measures are the predisposing personal functioning characteristics of general health and mobility. Income and sex emerge as significant predictors of three wellbeing measures. Childlessness never surfaces in these models, and co-habitation with someone only explains variation for satisfaction with life scores.

Regarding mental health, the single most influential variable was satisfaction with health, which accounted for approximately 23 per cent of the overall variance. Sex, income and mobility were also included as predictor variables. The only social network variable that emerged in the regression equation was companionship support. These five characteristics combined explain about 31.5 per cent of the variance in mental health scores.

Unlike the mental health measure, variations in loneliness scores seem to be explained by a larger number of factors, the most important of which is the network variable reciprocity, which accounts for approximately 12 per cent of the variance. The second most influential variable was satisfaction with general health. Other background variables included in the model were age, sex and mobility. Several network variables also account for some degree of variance, especially network functional variables (emotional, instrumental, informational and companionship supports). The network's average size and the proportion of neighbours are the structural variables included in the model. Finally, duration of ties, a relational-contextual variable, also emerges as a significant predictor of feelings of loneliness and social isolation.

As expected, the multivariate analysis of depression scores presented several similarities with the mental health model. Once again, general health emerged as the most influential variable, and only one network functional variable was included as a predictor. However, instead of the central role of companionship, depression scores seem to be better explained by informational support. Together with age, sex, income and mobility, the final model includes six variables that explain 38 per cent of the overall variance in this outcome measure.

As in the loneliness score, satisfaction with life seems to be better explained by a more significant number of factors, the most important of which is once more satisfaction with general health. Income and mobility were also influential in explaining the SWLS score, and living alone emerged for the first time as a significant predictor, even though it accounted for a relatively small amount of the explained variance. The network's functional characteristics, namely reciprocity and emotional, instrumental and informational support, also entered the equation. Once again, the network's structure and relational-contextual features were less relevant, as only the percentage of neighbours in the network and the duration of ties were included in the model.

Discussion

Aligned with previous findings from other European countries, we found that childless Portuguese older adults have smaller networks than those who are parents (Dykstra, 2006; Dykstra and Wagner, 2007). Network composition also differs between subsamples, with older non-parents including more friends and neighbours in their pool of significant others. This increased diversity might compensate for the absence of children and linear kin (Pushkar *et al.*, 2014; Klaus and Schnettler, 2016; Deindl and Brandt, 2017), but non-parents' networks seem, nonetheless, to present structural weaknesses. On the one hand, Dykstra (2006) points out that these smaller networks configure a vulnerability to social isolation in late life because they are more prone to depletion due to the loss of age peers (e.g. friends, cousins, sisters and brothers). On the other hand, even though friends, neighbours and members of extended kin might provide sporadic informal support (Schnettler and Wöhler, 2016; Deindl and Brandt, 2017), the non-existence of children, who frequently assume a care-giving role, may place non-parents in a vulnerable position when facing deteriorating health (Albertini and Mencarini, 2014). Intensive and time-consuming care-giving to frail and dependent childless older adults does not usually fall on the shoulders of friends or neighbours but is ensured by professional providers and formal support services (Deindl and Brandt, 2017). This might entail a considerable vulnerability to lack of support in countries with culturally engrained and legally determined family assistance obligations, where the provision of non-family-based care services is limited (Albertini and Mencarini, 2014). Larsson and Silverstein (2004) point out that even in an advanced welfare states like Sweden, public in-home care does not mitigate the lack of support of childless older adults living alone, who have fewer chances than parents of remaining home and avoiding institutionalisation. Our results show that non-parents do have a higher probability of receiving formal social services' support, including residential care. However, similarly to another study in a familialistic Southern European country (Albertini and Mencarini, 2014), we found no empirical evidence for a marked support deficit in the social networks of older non-parents. Average scores of perceived support from network members and the frequency of contacts and geographic dispersion did not differ significantly between childless and parent subsamples. Reciprocity, however, was lower among non-parents, and this particular network feature seems to have significant implications on wellbeing that we will address below.

The childless subsample reported less satisfaction with life and more feelings of loneliness, but these results need to be carefully pondered. Networks' functional variables (perceived support and reciprocity) present the most significant correlations with all wellbeing measures, but most network differences between parents and non-parents emerge in the structural domain. On the other hand, those who live alone reported lower scores on every type of support assessed. As such, their networks seem to present functional vulnerabilities that impact childless and parents alike. Parents who live alone present worse mental health outcomes, and childless individuals in solitary living arrangements have the lowest average score on the satisfaction with life scale and the highest on the loneliness index.

Regression analysis showed that childlessness, *per se*, was not significantly related to any of the psychological wellbeing outcome measures employed. Although similar results are reported (Zhang and Hayward, 2001; Zhang and Liu, 2007; Chang *et al.*, 2010; Vikström *et al.*, 2011), no consensus exists on this topic, as some researchers found that after controlling for sociodemographic variables, childlessness was still significantly associated with decreased life satisfaction (Zhang and Liu, 2007), loneliness and depression (Chou and Chi, 2004). Others found that parental status significantly impacts cognitive wellbeing (self-esteem and life satisfaction) but only among women (Hansen *et al.*, 2009).

The absence of parental status from the regression analysis models was a surprising finding because childless adults and older adults tend to report lower psychological wellbeing when embedded in traditionalist pronatalist countries with less-tolerant societal norms towards childlessness, where disapproval and criticism from the social environment may be more significant (Huijts *et al.*, 2013; Tanaka and Johnson, 2016; Zoutewelle-Terovan and Liefbroer, 2018). However, despite the cultural emphasis placed on family relations and support, the disapproval rate of childlessness in Portugal (23.8%) is similar to other Southern and Western European countries, such as Spain (25.0%), Germany (24.1%) and France (30.4%); and it is much lower than in Eastern European countries, such as Ukraine (82.7%), Bulgaria (82.5%) and Russia (81.9%) (Huijts *et al.*, 2013). Additionally, some studies do not support this context-dependent association between parental status and wellbeing (Hank and Wagner, 2013).

Regression analyses show that background variables, such as health, sex, age and income, appear to be much more powerful determinants of wellbeing in old age than parenthood, and living alone only surfaces as a significant predictor of life satisfaction. However, one of the major findings from this study is the emergence of several social network variables as predictors of mental health, loneliness and social isolation, depressive symptomatology and satisfaction with life.

As expected, network size accounts for some variance in loneliness and social isolation scores. More surprising was the finding that the percentage of neighbours in the network was negatively related to life satisfaction and positively associated with feelings of loneliness. In fact, several studies on neighbourhood attachment tend to highlight its importance in countering social isolation and loneliness (Kearns *et al.*, 2015; Weijs-Perrée *et al.*, 2015; Kemperman *et al.*, 2019). One possible explanation for our findings is that heavier reliance on neighbours might be the symptom of 'local self-contained' or 'private restricted' networks (Wenger, 1991). Both these types of networks appear to be more frequent among childless older adults (Wenger, 1991; Burholt and Sardani, 2018), and both are smaller and characterised by neighbours assuming a monitoring role. They are also vulnerable networks, with several weaknesses (*e.g.* lack of informal support, absence of reciprocal ties, low community involvement, risk of social isolation) (Wenger, 1991) that can negatively impact psychological wellbeing.

Network reciprocity emerged as the most influential predictor of loneliness and was also a significant factor in explaining life satisfaction. Litwin (1995) also found that participatory equality is negatively related to depression, suggesting purposive intervention to help older people achieve greater parity in their social networks. Recent research on childless old age has shifted its focus from what non-parents

need to what they give. Pesando (2019) found that childless adults aged +40 are more likely to support their ageing parents than individuals with children and argued that the purported strain that childless older adults place on the welfare system might be compensated by the upward intergenerational support they provide during middle age. Albertini and Kohli (2009: 1272) showed that childless older adults are more involved in voluntary and charitable work and that their stronger and supportive ties with non-kin might make them 'pioneers of a culture of post-familial civic engagement'. However, our findings indicate that network reciprocity is lower among childless Portuguese older adults, suggesting an untapped support potential for their communities and society.

Finally, it appears that network support, its functional dimension, is far more critical for psychological wellbeing than network structure or its relational-contextual features. Using a similar network assessment inventory, Litwin (1995) also found a similar 'function over structure' pattern among immigrants in later life, with network support emerging as a significant factor in understanding variance in mental status scores. In our study, emotional and instrumental support from network members accounts for some variance in loneliness and life satisfaction scores; companionship emerges as a critical variable for mental health and loneliness; and informational support has an even more far-reaching influence, explaining a portion of the variance in three outcome measures.

Implications for practice and research

The empirical evidence regarding the influence of network factors on psychological wellbeing in later life has implications for implementing social network interventions. The impact that network reciprocity has on loneliness and satisfaction with life and the lower levels of mutuality in interpersonal exchanges of childless individuals indicate that this might be an essential focus of intervention. Promoting an interpersonal environment with more opportunities to reciprocate through community participation, volunteering or other activities could enhance childless older adults' sense of wellbeing. However, this can prove to be a societal challenge, as data from the 2018 Survey on Volunteer Work (Statistics Portugal, 2019) indicate that Portugal has one of the lowest volunteer rates in the European Union, probably due to cultural factors and socio-economic conditions, and that Portuguese people aged 64+ are seldom involved in formal/informal volunteer work.

Also, the role that the various types of support have on psychological wellbeing suggests that network interventions should be geared towards improving network functions. Specifically, the importance of companionship and informational support for general mental health and depression could be considered when designing therapeutic interventions, such as network therapy or reinforcement, individual or group psychotherapy.

Although our results indicate that childless older adults do not have support deficits, their smaller networks and reliance on extrafamilial relations pose a specific vulnerability, especially in situations of long-term and/or intensive care, with implications on social policy. In Portugal, the recently approved 'Informal Caregiver Statute' (Law No. 100/2019, 6 September) establishes rights and support measures

aimed at improving social protection and promoting the work–life balance of informal carers (Perista, 2019). Despite the progressive nature of this law, it retains a familistic undertone and does not take into account the unique situation of childless older adults, as only family members are eligible as informal care-givers, thus excluding friends and neighbours who represent a significant portion of childless older adults' social networks.

Non-parents in our sample had a higher probability of living alone, and solitary living arrangements had a negative impact on respondent's life satisfaction. These results signal the importance of carefully pondering alternative living arrangements for childless older adults, such as home-sharing schemes, intergenerational housing (pairing older and younger people), co-housing or co-living. Such innovative housing solutions are recently gaining support in Portugal, with several pilot projects implemented throughout the country, and there is evidence that they promote health, wellbeing and quality of life in older adults, while at the same time providing benefits to other segments of society (Quinio and Burgess, 2018; Rusinovic *et al.*, 2019; Puplampu *et al.*, 2020; Suleman and Bhatia, 2021). However, some authors caution that these co-living models warrant further research regarding their risks, benefits and legal frameworks (Quinio and Burgess, 2018).

Considering that income emerges as a significant predictor of mental health, depression and life satisfaction (but not loneliness/social isolation), some additional comments regarding the 'age-old problem of old age poverty in Portugal' are warranted (Rodrigues and Andrade, 2013). Old-age poverty rates saw a significant decline during the last decades, particularly during the 2000s, which was a period of drastic social policy change, with the introduction of the 'Solidarity Supplement for the Elderly' in 2006 (means-tested benefit aimed at bridging the gap between old-age income and the national poverty line) and the 2007 reform of the 'Social Security Law'. Despite these significant advances, poverty pockets persisted in 2010, with those aged 75+ and living alone recording a poverty rate above 30 per cent (Rodrigues and Andrade, 2014). Additionally, the impact of the Portuguese 2010–2014 financial crisis (and of the intense austerity economic policies implemented post-2010) and of the more recent COVID-19 pandemic (Grané *et al.*, 2021) is yet to be ascertained and can reverse the above-mentioned achievements in the economic (and psychological) wellbeing of Portuguese older adults.

Study limitations

This study presents some limitations that pave the way for future research. Similar to previous studies (Chou and Chi, 2004; Chang *et al.*, 2010; Vikström *et al.*, 2011), the cross-sectional design ruled out the possibility of drawing conclusions about causality. In this sense, we agree with Zhang and Hayward (2001) when they point out the importance of implementing longitudinal designs to understand the relationship between childlessness and psychological wellbeing. Another design limitation was the non-probabilistic convenience sampling procedure and the restricted number of individuals in the childless subsample that precluded specific statistical analyses. These low numbers of older non-parents in study samples are recurring in childless old-age research (Vikström *et al.*, 2011; Krenkova, 2019).

Our study also did not address some factors that could influence the relationship between childlessness, social networks and psychological wellbeing, namely distinguishing voluntary from involuntary childlessness and considering the different life paths and complex life histories that lead to childlessness at advanced ages (Chou and Chi, 2004; Dykstra, 2006; Vikström *et al.*, 2011; Hank and Wagner, 2013; Pesando, 2019). As stated earlier, the Personal Network Assessment Inventory has some limitations (*e.g.* discriminating spouses and/or adult children in network composition), and due to the quantitative and quasi-epidemiological nature of our study, we had to rely on brief and/or simplified measures of complex phenomena, such as reciprocity. As such, qualitative research focused on childless old age could provide an in-depth understanding of the subtleties and complexities of this social reality, thus (dis)confirming the implications for social policy and network interventions discussed in this paper. However, it should be noted that a significant advantage of our study's design relative to previous research efforts (Zhang and Liu, 2007; Vikström *et al.*, 2011; Huijts *et al.*, 2013) was the use of several validated psychometric measures of psychological wellbeing.

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Ethical standards. The research was conducted in accordance with the principles embodied in the Declaration of Helsinki and in accordance with local statutory requirements. All participants gave written informed consent to participate in the study.

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