UNIVERSITAT DE BARCELONA

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Joan Domènech Abella
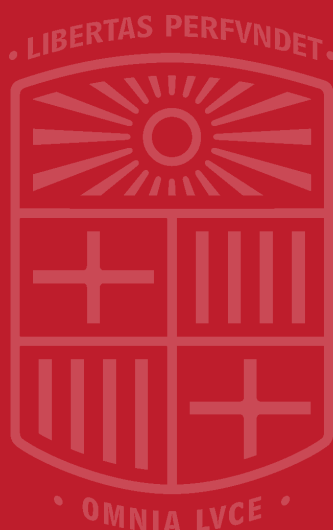
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Joan Domènech Abella

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L'IMPACTE DE LES CONDICIONS SOCIALS EN LA SALUT MENTAL: SOLEDAT I DEPRESSIÓ EN PERSONES GRANS.

Tesi presentada per:

JOAN DOMÈNECH ABELLA

Per obtenir el grau de Doctor per la Universitat de Barcelona

Dirigida per:

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El Dr. **Josep Maria Haro Abad**, professor associat de la Universitat de Barcelona i director d'investigació del Parc Sanitari Sant Joan de Déu de Sant Boi de Llobregat (Barcelona).

El Dr. **Jordi Mundó Blanch**, professor titular de la Universitat de Barcelona.

CERTIFIQUEN QUE:

Els articles que composen la present tesi doctoral han estat publicats en revistes indexades per *Journal Citation Reports* (JCR) a la categoria de Psiquiatria. Seguint l'ordre en què es reprodueixen, els dos primers han estat publicats a *Journal of Affective Disorders* (factor d'impacte = 3,786, quartil 1) i els dos restants a *Social Psychiatry and Psychiatric Epidemiology* (factor d'impacte = 2,918, quartil 2). El doctorand **Joan Domènech Abella** ha estat l'autor principal i de correspondència dels quatre articles i cap dels coautors ha utilitzat o té intenció d'utilitzar algun d'aquests articles com a component d'una altra tesi doctoral. El conjunt del treball, titulat "L'impacte de les condicions socials en la salut mental: soledat i depressió en persones grans", ha estat realitzat per tal d'optar al grau de Doctor per la Universitat de Barcelona en el Programa de Doctorat en Sociologia, s'ha desenvolupat sota la nostra supervisió i direcció i és apte per al seu dipòsit i defensa pública a la Universitat de Barcelona.

I, perquè consti i tingui els efectes que corresponguin, signem el present document a Barcelona, 25 de juny de 2019.

Signat. Josep Maria Haro

Signat. Jordi Mundó

Agraïments

Ara que el temps sembla un recurs més escàs que mai, trobo de rebut agrair el temps que altres persones m'han dedicat. Sense aquest temps prestat res no hagués pogut aprendre, ni tan sols a ser. En primer lloc, vull agrair als meus directors de tesi, Josep Maria i Jordi, la seva imprescindible col·laboració en ajudar-me a perfilar el camí de la recerca i a superar els moments d'incertesa.

Voldria agrair també als companys de la Unitat de Recerca del Parc Sanitari Sant Joan de Déu, haver-me donat l'oportunitat de treballar en un gran equip. En especial, vull agrair a la Maria R., l'Elvira, la Bea i la Maria Victoria la seva paciència i generositat en compartir part dels seus coneixements. A aquesta llista, vull afegir-hi l'Ignacio, la Montse, la Maria I., el Joan i la Sara, que de forma extraacadèmica han sabut trobar un espai per a l'amistat i la diversió en aquest procés. També vull agrair el seu treball al PDI del departament de sociologia de la UB, en especial al David, al Julio, al Marc, a la Marta, a l'Edgar i al Raül, pels "dinars temàtics", als membres del GREECS i a les companyes de despatx: l'Ariadna, la Teresa i la Susana. *Ik ben ook mijn collega's van de Vrije Universiteit Brussel: Lise, Sylvia, Flore, Júlia, Liesbeth, Sarah, An-Sofie, Daan, Eva en Gabriel, dankbaar voor het delen van hun onderzoek en om me thuis te laten voelen.*

Cada dia agraeixo a la natura la companyia de la meva estimada Mireia i de les meves filles -Isolda i Joana-, així com la seva capacitat de fer-me feliç cada dia a través d'elles. També li agraeixo uns avis preciosos -Remei, Jeanne, Manolo, Nati i la tia Delfina-, el suport incondicional del pare i la mare, a qui dec tot, i l'afecte dels meus germans - Cristina, Anna i Marc-, que sempre hi són. A tots ells i també als meus nebots -Guillem, Ariadna, Eva, Helena (i els que vindran)-, als meus familiars polítics -Noe, Evaristo, Martí, Carla, Alejandro, Montse, Àlex i Tània- i als amics de (quasi) tota la vida -Dani, Mari, Lluc, Jaume, Pau, Jordi, Lluís (i la resta)- els agraeixo la seva meravellosa companyia en aquest viatge.

Finalment, envio una forta abraçada als companys i companyes en la lluita per la llibertat, en especial a la "vella guàrdia" de l'Assemblea del Baix Llobregat i, amb molta tendresa, als exiliats, exiliades, presos i preses polítics catalans i a totes aquelles persones que, com elles i ells, pateixen la repressió per tenir la ferma voluntat de fer d'aquest món un lloc millor.

"Naixem sols i morim sols, i en el parèntesi,
la solitud és tan gran, que necessitem
compartir la vida per oblidar-la."
Erich Fromm

CONTINGUT

FINANÇAMENT

PRÒLEG

El **capítol 1** conté la introducció del present treball d'investigació, a través de la qual es pretén: 1) exposar de forma succinta les causes i les conseqüències de l'envelliment de la població, focalitzant l'anàlisi en els països de la Unió Europea; 2) presentar les diferents teories que existeixen en gerontologia social i que es refereixen a com l'entorn social, polític o econòmic condiciona la qualitat de vida de les persones grans; 3) presentar un marc conceptual sobre els condicionants socials de la salut mental; i 4) a partir de les diferents teories exposades, aplicar una perspectiva teòrica que, a través del marc conceptual proposat, ens permeti afrontar una revisió adequadament articulada de la literatura científica sobre els condicionants socials de la soledat i la depressió en persones grans. El contingut de la introducció és clau en el desenvolupament del present treball d'investigació, atès que el nostre propòsit és plantejar els objectius de la tesi en base a aquells aspectes que no compten amb un consens entre la comunitat científica i que deixen preguntes obertes. Les diverses estratègies de resposta a aquestes preguntes estan formulades en els quatre articles publicats en revistes internacionals de gran impacte científic que composen el capítol 3, els resultats dels quals són discutits de forma integrada al final de la present tesi doctoral.

El **capítol 2** conté els objectius i les hipòtesis. Per tal de justificar els objectius, hem decidit delimitar la perspectiva teòrica general del treball d'investigació i identificar les diferents qüestions que queden obertes en la revisió bibliogràfica presentada en la introducció. Cadascuna d'aquestes qüestions es vincularà a un dels diferents objectius de la tesi. Seguidament, es desplegaran diferents hipòtesis en base als objectius i en funció de les respostes que es considerin més plausibles en cada cas. Com podrà veure's, es tracta d'una metodologia estrictament quantitativa que té en compte diferents nivells d'anàlisi i a través de la qual hem intentar dur a terme els objectius plantejats. Cada objectiu es vincula a un dels articles que composen el tercer capítol i que tracten de validar o refutar les diferents hipòtesis plantejades.

El **capítol 3** es divideix en quatre seccions, constituïdes respectivament pels quatre articles d'investigació publicats, incloent en cada cas la metodologia de l'estudi, les anàlisis, l'exposició i la discussió dels resultats. En el primer article s'avaluen les diferents variables mediadores entre estatus socioeconòmic i depressió. En el segon, les possibles relacions longitudinals existents entre soledat, depressió i aïllament social. En el tercer

treball s'avalua el rol dels diferents components de les xarxes socials en la relació entre depressió i soledat. Finalment, en el darrer article s'estudia, per una banda, la interacció entre capital social cognitiu i capital social estructural i, per l'altra, entre estatus socioeconòmic i edat; en ambdós casos s'exploren com a interaccions relacionades amb els sentiments de soledat en persones grans. L'objectiu és detectar si l'edat modera la relació entre estatus socioeconòmic i soledat, o si el capital social estructural modera la relació entre capital social cognitiu i soledat.

En el **capítol 4** es discuteixen els resultats, es descriuen les fortaleses i limitacions, i s'exposen les possibles implicacions que poden inferir-se de l'estudi i futures línies d'investigació. El capítol s'estructura en diverses parts que es corresponen amb els camps específics d'investigació relacionats amb cadascun dels objectius: l'associació entre estatus socioeconòmic i depressió; la relació entre xarxes socials, soledat i depressió i altres condicionants socials de la soledat. En base als resultats obtinguts, es valoraran les diferents intervencions existents per reduir la prevalença de depressió i mitigar els sentiments de soledat en persones grans.

Finalment, en el **capítol 5** es resumeixen les principals conclusions del treball d'investigació realitzat. A l'**annex** es reprodueixen la resta d'articles que l'autor ha publicat com a primer autor i una llista dels articles en els quals ha col·laborat durant la realització de la seva tesi doctoral.

ABSTRACT

INTRODUCTION

The United Nations states that the current aging of the population is unprecedented, generalised and will have profound implications for many aspects of human life. From 1980 to 2017 the world population aged of 60 and above increased from 382 to 967 million people. This figure is expected to be doubled by 2050, reaching 2,100 million. Trends indicate that by 2050 there will be more people over 60 than youth from 10 to 24 years old (2,100 and 2,000 million, respectively). It is also anticipated that from 2017 to 2050, the amount of 80-year-old people will be tripled, going from 137 to 425 million.

Although some of the negative consequences of aging are unavoidable - increased risk of chronic diseases, loss of relatives and friends, and impairment of functional capacity -, many others can be mitigated. The latter vary between countries depending on their economic, political, cultural and social context being, at the same time, conditioned by individual cultural, economic and sociodemographic features. Therefore, the different analytical tools offered by social gerontology to understand the social determinants of well-being into old age and their causal mechanisms, remain at the disposal of those political leaders willing to improve the quality of life in the elderly.

Regarding mental health, aging is associated with an increase in the incidence of dementia, which constitutes a huge scientific challenge. However, depression is probably the most common mental disorder in many age groups. In Europe, lifetime prevalence of major depressive disorder ranges from 9.9% in Germany and Italy to 21.0% in France. Among all medical conditions, this disorder is the second most important contributor to the burden of chronic illnesses that cause "years lived with disability". Depression is associated with an increase in the prevalence of other health problems and it has a significant impact on the cost of healthcare resources. Moreover, it is estimated that up to 50% of the 800,000 annual suicides around the world occur in the context of a depressive episode. Depression is particularly associated with loneliness in the elderly and, together, they entail a drastic decline in their quality of life.

OBJECTIVES

Through a review of the literature we have detected issues that require additional research and that result in the following objectives:

1. Evaluating the mediator variables of the relationship between socio-economic status and likelihood of suffering from major depressive disorder among people of middle (50-65) and advanced (over 65) age.

2. Analysing the longitudinal associations between feelings of loneliness, objective social isolation and depression.

3. Studying the role of the different components of social networks in the relationship between loneliness and depression.

4. Investigating the impact of the interaction between socio-economic status and age, as well as between individual and collective social capital on the probability of feeling lonely.

METHODS

The approach adopted in the present study is that of the critical gerontology, applied through the methodology of successful aging models, closely linked to social epidemiology. It is, therefore, a strictly quantitative methodology considering different levels of analysis. Depending on the characteristics of each objective, the following databases have been used:

Studies linked to the first and third objectives are part of the Collaborative research on ageing in Europe (COURAGE in Europe) project. It is a cross-sectional study, funded by the EU, with a representative sample of the non-institutionalized population aged 50 or above. Home interviews were conducted in three European countries (Finland, Poland and Spain), selected to make comparisons between North, South and Eastern Europe, taking into account various demographic, cultural, socio-economic and health features. The answers of 7,966 people interviewed between April 2011 and May 2012 were analysed.

With the objective of providing data on the longitudinal associations between objective social isolation, loneliness and depression, the second study was conducted with data from The Irish Longitudinal Study on Aging (TILDA), a prospective study with a representative sample of the non-institutionalized population aged 50 and above, resident in Ireland. The results obtained from 5,066 people interviewed along the second (between April 2012 and April 2013) and the third wave (between October 2014 and October 2015) were analysed.

The last article was part of The Sant Boi Aging Study (SBAS), a cross-sectional study with a representative sample of the non-institutionalised population aged 50 year and above, resident in Sant Boi de Llobregat. This study allows to make comparisons between neighbourhoods and to investigate concepts such as neighbourhood social capital. The study is based on simple random sampling, selected from the municipal census data. The interviews took place between October 2014 and October 2015. The final sample included 1,124 individuals.

In all cases, loneliness was evaluated through the loneliness scale of the University of California-Los Angeles (UCLA); the characteristics of social networks were based on Berkman-Syme's social networks index; and the major depressive disorder was evaluated through the International Diagnostic Interview (CIDI). Logistical regression models and mediation analysis were carried out to test the different hypothesis.

RESULTS

Specific results for each objective were obtained:

1. Psychosocial factors and loneliness showed the strongest associations with depression among mediator variables. However, material factors and, especially, financial strain had a higher mediating function in the association between all socioeconomic status markers and depression. Other factors that significantly mediated the relationship were the behavioural factors, in the case of education, and the psychosocial factors, in the case of employment.

2. The longitudinal association between loneliness and depression is bidirectional, although stronger with loneliness as a source, while the higher levels of social integration are associated unidirectionally to a lower probability of major

depression. The association between loneliness and the subsequent decline of social integration is also unidirectional.

3. Among people feeling lonely, those with depression were more frequently married and had a small social network. Among those without loneliness, depression was associated with being previously married. In depressed people, feelings of loneliness were associated with having a small social network; while among those without depression, feelings of loneliness were associated with being previously married.

4. Among the younger participants, individuals with lower socioeconomic status had a higher probability of suffering from loneliness, whereas differences on loneliness for older participants according to their socioeconomic status were not found. Moreover, participants having high individual social capital and living in an area with high neighbourhood social capital presented a lower probability of suffering from loneliness.

DISCUSSION

Although it is very common in social epidemiology to use the educational level as a proxy of socioeconomic status, our results show that each of the traditional components of socio-economic status (educational level, household income and employment) have an independent impact in the probability of suffering from depression during the old age. In addition, each of these components has different sets of mediator variables contributing to the causal explanation of this impact. While in the case of household income the mediator variables are only those related to the scarcity of material resources, in the case of the educational level the behavioural factors play a key role.

Regarding the longitudinal relationship between loneliness, objective social isolation and depression, the results of our study show how social isolation and loneliness are the causes of depression and suggest that the existence of studies proposing an inverse relationship might be due to confusion factors such as other chronic health conditions or financial problems aggravated by the very same illness. Furthermore, although in most of the literature reviewed it is assumed that loneliness is a consequence of social isolation, our results prove exactly the opposite, which could be explained by the newly raised "evolutionary theory of loneliness", according to which feelings of loneliness make

individuals withdraw into themselves, thereby hindering the maintenance of social ties. It would be a mechanism with an adaptive function during human evolutionary history that would be clearly dysfunctional in modern times.

According to our results, we also suggest that two types of loneliness exist depending on the position held by the individual in the social network. The first type, which would be experienced by individuals on the periphery of the social network (i.e., individuals with fewer contacts), would be more closely related to depression, which in turn has been associated with lack of social support. In individuals with central positions in the social network, i.e., those with a higher number of links, loneliness is not explained by the social network or associated with depression. In these individuals, marital status has greater influence on loneliness. The possible existence of loneliness subtypes is consistent with the need to distinguish between emotional and social loneliness to improve the effectiveness of psychosocial interventions, as suggested by other researchers.

Regarding the impact of the interaction between socio-economic status and age in the probability of feeling loneliness among people of middle and advanced age, our findings show that low SES levels were significantly associated with loneliness only among middle-aged adults (50–59 years old). These age cohort differences for the effect of socioeconomic status on loneliness could be explained by survival bias. Those with low socioeconomic status and high loneliness might be more likely to die or present severe health problems such as dementia and, therefore, preventive policies before oldest ages could be more efficient than palliative ones. Finally, the results obtained regarding the influence of neighbourhood social capital on the prevalence of loneliness could contribute to guide these preventive policies.

CONCLUSIONS

Globally, the results of this study highlighted the difficulties of socially isolated elderly to rebuild or improve the characteristics of their social networks, with a particular impact among those with a low socioeconomic status. A situation that can be progressively exacerbated by feelings of loneliness. All these factors -objective social isolation, feelings of loneliness and socioeconomic status- have proved to be independent and robust risk factors for the presence of depression in old age. Therefore, the creation of social

environments capable of alleviating the effects of the deterioration of social networks caused by the passage of time has could be a fundamental strategy to reduce the prevalence of depression in the elderly. The relief of loneliness through cognitive therapy or the reversal of the consequences of material depravity through the granting of financial aid to the most disadvantaged may be complementary measures.

KEYWORDS

Social networks, loneliness, depression, socioeconomic status, aging well, epidemiology, population-based study, European countries.

Capítol 1

INTRODUCCIÓ

1.1: Causes i conseqüències de l'envelliment de la població

L'envelliment de la població és un problema mundial de primer ordre. Les Nacions Unides descriuen l'envelliment de la població com un fenomen sense precedents, generalitzat i amb implicacions profundes per a moltes facetes de la vida humana. Des del 1980 fins al 2017 la població mundial de 60 anys o més -d'ara endavant, també ens hi referirem com a "persones grans" (United Nations, 2017)- ha passat de 382 a 967 milions de persones. Es preveu que aquesta xifra es dupliqui el 2050 arribant als 2.100 milions. El 2050, les projeccions indiquen que hi haurà més persones de 60 anys o més que joves d'entre 10 i 24 anys (2.100 i 2.000 milions, respectivament). Es preveu, a més, que entre el 2017 i el 2050, la quantitat de persones de 80 anys es tripliqui, passant de 137 a 425 milions (United Nations, 2017).

Fer-se gran no comporta les mateixes conseqüències per a tothom, ja que aquestes depenen, en gran mesura, d'altres variables socioeconòmiques, sociodemogràfiques i culturals. Per exemple, la proporció de persones de 60 anys o més que viuen soles o amb un cònjuge és força variable dependent del territori, i oscil·la significativament entre un 2,3% a l'Afganistan i un 93,4% als Països Baixos. El 2010, a Àsia, Àfrica, Amèrica Llatina i el Carib, més de la meitat de les persones grans residien amb un o més nens, mentre que a Europa i a Amèrica del Nord, només el 20% de les persones grans residien amb nens. En general, les dones grans són més propenses que els seus homòlegs masculins a viure soles i, tant a Àfrica com a Europa, presenten el doble de probabilitats (United Nations, 2017).

Encara que el procés d'envelliment de la població és més avançat a Europa i a Amèrica del Nord, on més d'una persona de cada cinc tenia 60 anys o més el 2015, les poblacions d'altres regions també estan envellint. El 2050, es preveu que les persones grans representin el 34,2% de la població a Europa, el 28,3% a Amèrica del Nord, el 25,5% a Amèrica Llatina i el Carib, el 24,6% a Àsia, el 23,3% a Oceania i el 8,9% a Àfrica. A nivell europeu, Espanya (41,4%) seria el primer país del sud d'Europa amb un major percentatge de persones grans, per davant de Portugal (41,2%) i Grècia (40,8%). El percentatge previst de persones grans al sud d'Europa (40,0%) contrasta amb el de l'est d'Europa (31,9%) i, especialment, amb el del nord d'Europa (30,7%) (United Nations, 2015a). La diferència entre territoris és representada a la Figura 1.
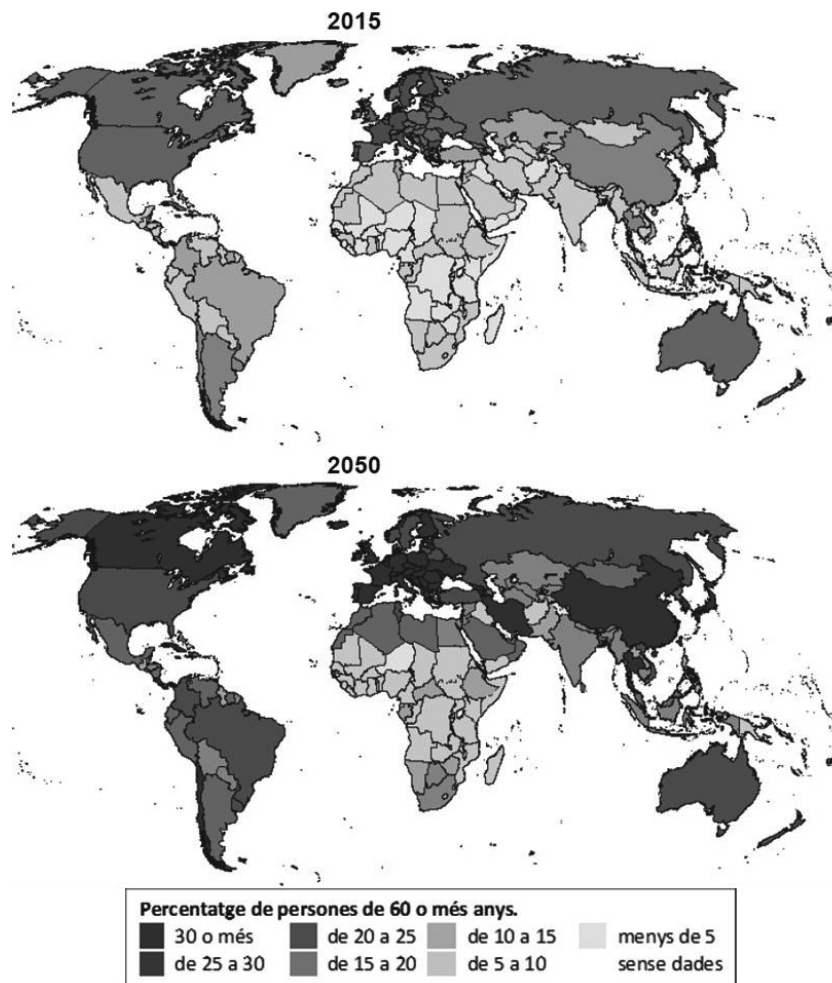
Figura 1. Proporció de persones de 60 anys o més al 2015 i projecció per a l'any 2050. Font: United Nations (2015a).

L'envelliment de la població pot ser explicat per l'augment de la longevitat i el descens de la fertilitat, un patró que s'ha manifestat durant les darreres dècades en els països desenvolupats. L'augment de l'esperança de vida, conseqüència dels avenços en la ciència mèdica i en la cobertura social, comporta un «envelliment a la cúspide» de la piràmide de població, mentre que el descens continuat dels nivells de fertilitat, conseqüència de la incorporació massiva de la dona en el mercat laboral i de l'adopció de nous rols de gènere, provoquen un descens en la proporció de joves en la població total, això és, un «envelliment a la base» de la piràmide de població (United Nations, 2017). En un anàlisi de les tendències futures de l'envelliment de la població a la Unió Europea, les previsions demogràfiques d'Eurostat (2018) per al període comprès entre 2017 i 2080 mostren de quina manera la piràmide de població s'estreny per la part central, adoptant forma de bloc i on la importància relativa de la franja d'edat més vella creix a una velocitat molt superior que qualsevol altre segment d'edat (veure Figura 2).
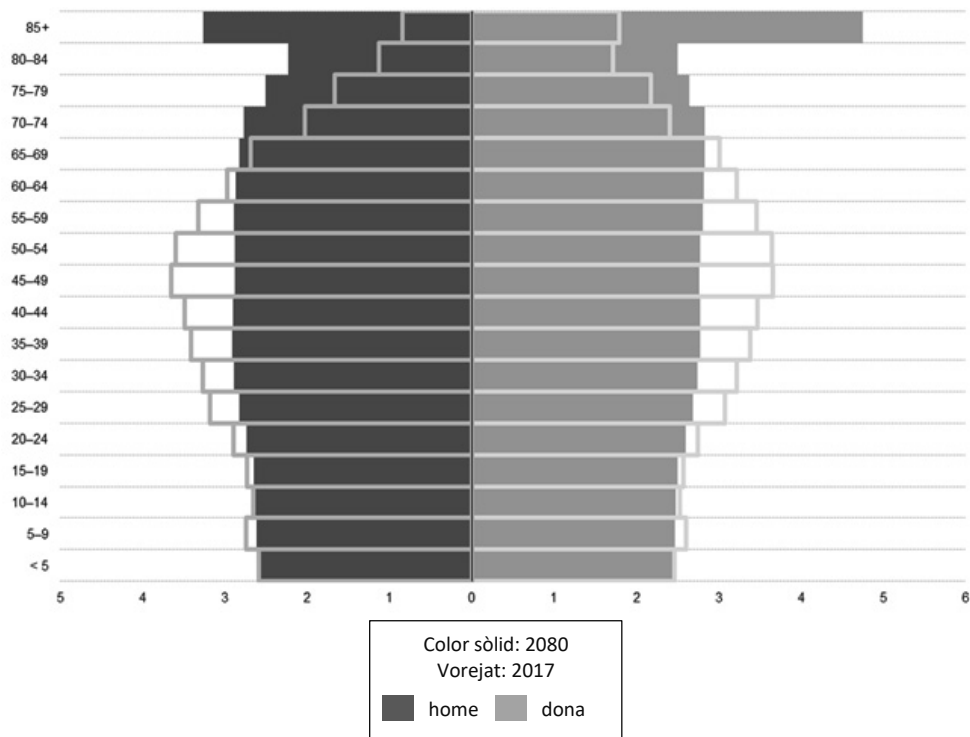
Figura 2. Piràmides de població de l'EU-28 al 2017 i projecció per al 2080.
Font: Eurostat (2018).

Com a resultat d'aquesta evolució demogràfica, en els països de la UE-28, es preveu que el percentatge de població en edat laboral experimenti una disminució constant fins al 2050, en què s'estabilitzarà. Conseqüentment, el percentatge de persones de 65 anys o més passaran de ser el 19,4% el 2017 a ser el 29,1% el 2050, i la taxa de dependència passarà del 30% el 2017 al 50% el 2050 (Eurostat, 2018) (veure Figura 3).
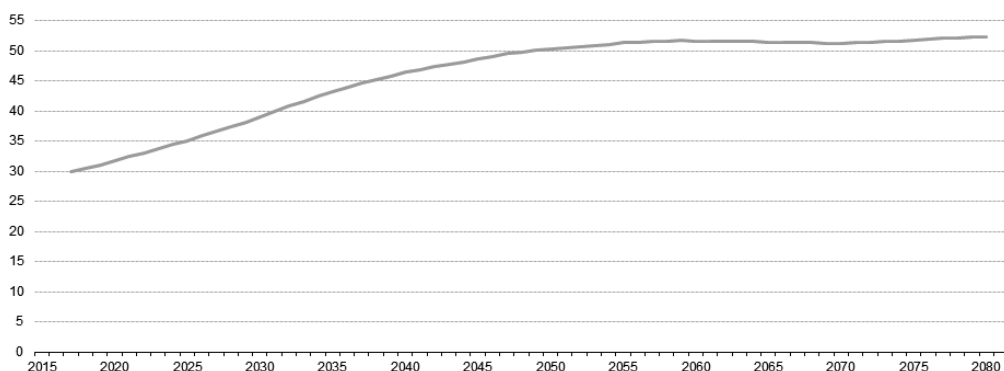
Figura 3. Projecció de la proporció (%) de dependència de les persones grans, EU-28, 2017-2080. Font: Eurostat (2018).

Tot i que l'envelliment comporta conseqüències negatives no modificables, com l'augment de risc de malalties cròniques, la pèrdua de familiars i amics o el deteriorament de la capacitat funcional (Rechel et al., 2013), la majoria de les conseqüències negatives de l'envelliment són modificables i varien entre els països en funció del seu context econòmic polític, cultural i social. Si ens fixem en la Unió Europea, les puntuacions d'exclusió social més elevades -prenent en consideració les dimensions de privació material, participació social i drets socials- es poden trobar als països de l'Europa de l'Est, particularment als països bàltics i a Polònia i, d'una forma més moderada, als països mediterranis. En referència a la relació entre exclusió social i envelliment, existeixen diferències segons la dimensió d'exclusió social i el país que es prengui en consideració. La dimensió dels drets socials -analitzada en termes d'accés a un habitatge adequat i a l'atenció mèdica- empitjora amb l'edat a gairebé tots els països de la Mediterrània i de l'Europa de l'Est, mentre que als països nòrdics, Alemanya i Regne Unit es produeix el resultat contrari, és a dir, l'accés als drets socials millora amb l'edat. En canvi, es donen resultats més homogenis en altres aspectes: a tots els estats membres de la UE l'exclusió en termes de participació social augmenta amb l'edat, mentre que la privació material acostuma a disminuir amb l'edat. Val a dir també que a tots els països la mala salut és un factor important que augmenta el risc d'exclusió social en totes les seves dimensions (Jehoel-Gijsbers i Vrooman, 2008).

És, per tant, el context econòmic polític, cultural i social de cada moment històric el que condiciona les conseqüències modificables de l'envelliment en un territori determinat. Des de finals dels anys 60, a la majoria dels països europeus s'ha acceptat que als 65 anys s'entrava en el que posteriorment es va anomenar "tercera edat", una etapa vital vinculada a noves oportunitats per a la realització personal després de la fi del treball a temps complert (Grenier, 2012). Però trobem indicis de què això ha canviat. A l'actualitat, i amb especial incidència a partir de la crisi financera del 2008, els partidaris de l'austeritat econòmica presenten una visió pessimista de l'envelliment de la població que el vincula a una inevitable degradació de l'estat del benestar i destaquen la necessitat de reduir els costos derivats de l'envelliment de la població mitjançant estratègies com l'extensió de la vida laboral i defugint polítiques socials integrades (Foster i Walker, 2015). En canvi, des d'una perspectiva més optimista, les percepcions alarmistes de l'envelliment com a amenaça fonamental per a l'estat del benestar europeu són infundades i els augments previstos de la despesa sanitària a causa de l'envelliment són

assumibles. Es tracta, per tant, d'un repte polític. En aquesta línia, l'Agenda 2030 per al Desenvolupament Sostenible, promou el plantejament i l'aplicació de polítiques que tinguin com a objectiu no deixar ningú enrere ("no one will be left behind"), això és, abordar les conseqüències socials de les principals tendències del canvi demogràfic sense que això impliqui l'exclusió de gran part de la població (United Nations, 2015b).

Si bé, per una banda, el pas d'una població majoritàriament jove a una de majoritàriament vella, com a conseqüència del descens de la fertilitat, té clares implicacions en la distribució de recursos socials i responsabilitats entre generacions i, per altra banda, l'augment de l'esperança de vida, si no es donen millores en l'esperança de vida saludable, té un impacte directe en la demanda de recursos sanitaris relacionats amb l'envelliment, aquestes tendències demogràfiques també tenen un efecte sobre aspectes que poden estar sotmesos a la intervenció política -com ara treball, aprenentatge, família, habitatge i connexions socials- i que poden contribuir a moderar les conseqüències de l'envelliment de la població sobre la distribució de recursos socials i sanitaris (United Nations, 2015b).

La possibilitat d'allargar la vida laboral ha de comportar la recerca de polítiques que satisfacin les necessitats particulars dels professionals joves que accedeixen al mercat laboral i la dels treballadors més grans (és a dir, els de 50 anys o més), tenint en compte les condicions i les característiques de cada lloc de treball, alguns dels quals són físicament inabastables pels treballadors de més edat (Rechel et al., 2013). Una vida laboral més llarga comporta que els treballadors hagin de ser més adaptables i, per tant, requereix d'una formació continuada al llarg de les diferents etapes vitals. La formació hauria de possibilitar la conciliació de les característiques de cada lloc de treball amb les necessitats psicosocials i les possibilitats físiques de cada treballador. Per altra banda, els processos d'aprenentatge contribueixen a una millor salut, cognició, benestar i resiliència en persones grans, fet que s'alinea amb la necessitat de reduir el seu nivell de dependència i d'allargar el seu període de vida autònoma (Field, 2000).

Paral·lelament al procés d'envelliment, la població europea està experimentant un creixement en la pluralitat d'estructures familiars que podria tenir un efecte sobre el benestar de les persones grans, principalment en el que respecta a les seves necessitats de recolzament assistencial i d'atenció, ja que aquestes necessitats han estat, en gran part, satisfetes per les famílies tradicionals al llarg de la història. És molt probable que les

respostes polítiques encertades siguin aquelles que adoptin un enfocament que inclogui totes les etapes vitals i que siguin capaces d'identificar les dependències entre generacions. Des d'aquest punt de vista, és especialment important reconèixer que les polítiques que afecten a les persones adultes més joves que han de tenir cura dels seus fills, afecten també a la seva fertilitat, a la conciliació de la seva vida laboral i familiar i, per tant, a les seves possibilitats d'actuar com a cuidadors i de veure satisfetes les seves necessitats assistencials posteriors (Pickard et al., 2012).

En referència a l'habitatge, si bé una gran part de les persones grans són propietàries de la seva llar, la qual cosa els proporciona una certa seguretat financera i la possibilitat de deixar una herència, l'augment dels preus immobiliaris pot acabar convertint aquests actius financers en càrregues que dificultaran, encara més, el suport entre generacions. Per altra banda, el canvi demogràfic augmentarà considerablement la demanda d'habitatge capaç de satisfer les necessitats de la gent gran i, tenint en compte que l'habitatge inadequat té un efecte perjudicial sobre el benestar individual i suposa un cost sanitari important, caldrà facilitar que, en fer-se gran, la gent pugui traslladar-se a una casa de mida i característiques adequades. Aquestes intervencions destinades a millorar l'habitabilitat de les persones grans també haurien de tenir en compte la millora de l'accessibilitat i la cohesió social a nivell de barri, dos factors ambientals clarament relacionats amb el benestar de les persones grans pel seu efecte sobre l'autonomia individual i les possibilitats de socialització (Herbers i Mulder, 2017).

La mancança de connexions socials o, més específicament, l'absència de relacions socials satisfactòries i la presència de sentiments de soledat són un problema de salut pública. La soledat es relaciona sinèrgicament amb la depressió, afecta de forma clara la qualitat de vida de les persones grans i ha estat associada a un augment de la disminució cognitiva, la demència, i la mortalitat precoç per totes les causes (Caccioppo et al., 2006). Diferents governs estan detectant la necessitat d'abordar el problema i estan creant agències governamentals o, fins i tot, algun ministeri (Pimlott, 2018). Tanmateix, se sap poc sobre com fer front a la soledat. Alguns estudis han mostrat resultats significatius en intervencions destinades a millorar les habilitats comunicatives, eixamplar el suport social, augmentar les oportunitats d'interacció social, o reconduir el dèficit en cognició social (Masi et al., 2011). Això no obstant, un major coneixement de les causes i les conseqüències de la soledat, podria aportar una major eficàcia a les intervencions i contribuir a una important millora en el benestar de les persones grans.

1.2: Teories de la gerontologia social

Les ciències naturals són paradigmàtiques, en el sentit que disposen d'un únic marc teòric que serveix com a explicació global i que, quan entra en crisi, és substituït per un altre (Kuhn, 1962). En canvi, en ciències socials no existeix una visió hegemònica i global que pugui ser considerada com a paradigma sinó tan sols una pluralitat de visions que sovint contribueixen, de forma complementària, a eixamplar el coneixement sobre un fenomen social. Mentre que les ciències naturals poden proposar-nos explicacions causals en un sentit fort, el desconeixement sobre la connexió causal entre el món biològic i el psicològic, provoca que les ciències socials tan sols puguin aspirar a fer intel·ligible el comportament humà, fonamentant-lo en una intencionalitat intuïtivament atribuïda a uns desitjos i unes creences (Mundó, 2006). Per tant, si volem aproximar-nos a la comprensió dels condicionaments socials del benestar en persones grans, haurem de prendre en consideració els diferents models explicatius que s'han plantejat al respecte, malgrat puguem establir una jerarquia entre ells, en base a l'abast del seu contingut i nivell de constatació empírica.

Aquests models explicatius conformen el sector del coneixement científic propi de la gerontologia social (Meyer i Daniele, 2016) que, des d'una perspectiva multidisciplinària, té com a objectiu la millora de les condicions de vida de les persones grans i proposa respostes a preguntes sobre de quina manera l'experiència individual d'envellir afecta a, i es veu afectada per, la posició que l'individu ocupa en les estructures socials, o sobre quins són els factors socials que condicionen el seu benestar. Prenent com a referència l'evolució de la gerontologia social als Estats Units (Bengtson et al., 2016), les teories fundacionals són classificades com a "psicosocials", en centrar-se en la descripció de models òptims d'envelliment que propiciarien el benestar i l'encaix de l'individu en el seu entorn social. Aquestes teories van fracassar en el seu objectiu d'assentar una teoria general, però van jugar un rol fonamental en l'aparició de la gerontologia social com a disciplina científica, fins al punt que una bona part dels seus criteris teòrics i metodològics encara romanen en el que posteriorment s'han anomenat models de envelliment reeixit (*successful aging*), que tenen com a objectiu detectar els factors de risc d'envelliment patològic per tal de dissenyar intervencions capaces de reduir la seva prevalença. Posteriorment a l'emergència de les teories "psicosocials", és qüestionaren determinades concepcions atomistes de la gerontologia social, que pretenien

aproximar-se a la comprensió de l'envelliment sense tenir en compte l'estructura social que el contextualitza. Conseqüentment, noves perspectives de caràcter estructuralista passaren a enriquir el coneixement gerontològic.

Tal com es presenta de forma esquematitzada a la Taula 1, les teories psicosocials poden ser classificades com a contractives o expansives, segons la descripció específica que facin d'envelliment òptim: en el cas de les contractives es proposa una contracció de les xarxes socials, mentre que en el cas de les expansives es proposa la necessitat de mantenir o expandir l'activitat social en les darreres etapes vitals. Per altra banda, les teories o perspectives estructuralistes poden ser classificades en funció de si prioritzen aspectes socioeconòmics o socioculturals de l'estructura social en els seus models explicatius. Finalment, proposem que els models d'envelliment reeixit esdevenen una oportunitat per aproximar-nos al fenomen de l'envelliment des d'una perspectiva multinivell, capaç d'explicar el rol de l'estructura social en el benestar psicosocial individual i analitzar tots aquests factors com a condicionants de la salut física i mental de les persones grans.

Tipus de teoria	Especificació	Teories i perspectives	
Psicosocial	Contractives	-Teoria de la Desvinculació -Teoria de la selectivitat emocional	-Envelliment reeixit
	Expansives	-Teoria de l'activitat -Teoria de la continuïtat	
Estructuralista	Sociocultural	-Teoria de la modernització -Constructivisme social	
		-Teoria de l'estratificació per franges d'edat	
	Socioeconòmic	-Teoria del curs de la vida -Gerontologia crítica	

Taula 1. Teories de la gerontologia social segons tipus de teoria i especificació.

1.2.1.-Teories psicosocials

Lluny d'aportar un model universal capaç de prescriure un desenvolupament psicosocial òptim en persones grans, sembla que les teories fundacionals de la gerontologia social van aconseguir exactament el contrari, aproximant-se a la constatació empírica de la inexistència d'un model d'aquestes característiques. Tres quarts de segle després de l'aparició de la gerontologia social com a disciplina científica, encara no existeix un consens respecte la hipotètica necessitat de contraure, mantenir o expandir els contactes

socials a mesura que les persones es fan grans. Per tant, el benestar psicosocial de les persones grans podria dependre de l'entorn que contextualitza cada cas concret més que no pas d'un model teòric general. Tanmateix, les diferents variables que es tenen en compte a l'hora de defensar cadascun d'aquests models, poden ser d'utilitat per comprendre els condicionants del benestar psicosocial individual en diferents entorns.

Un dels primers models que es van proposar és el que es planteja des de l'anomenada *teoria de l'activitat* (Havighurst, 1961), hereva de les primeres aproximacions que, des de les ciències socials, tractaven de comprendre les necessitats socials sorgides dels efectes de la segona transició demogràfica, caracteritzada -entre d'altres elements- per l'envelliment de la població. Aquests científics socials plantejaven la necessitat d'un "ajustament personal" de les persones en fer-se grans per tal d'adaptar actituds i comportaments a les expectatives i exigències de la societat (Cavan et al., 1949). L'argument central de la teoria gira al voltant de la necessitat de l'individu de mantenir el mateix nivell d'activitat social durant tota la vida i, per tant, d'adoptar nous rols substitutius dels rols perduts en el transcurs de la vida com a conseqüència d'esdeveniments de transició com ara la jubilació, la viudetat o la pèrdua de familiars i amics. La principal premissa és que les interaccions socials determinen el benestar de les persones grans i la concepció que és té del propi envelliment. Tanmateix, la teoria de l'activitat, que justifica intervencions basades en el foment de la substitució d'aquests rols, compta amb un suport empíric relativament baix. Alguns autors han destacat la necessitat d'aprofundir en aspectes qualitatius, com la importància del sentit atorgat a l'activitat, més que l'activitat en si mateixa (Lemon et al., 1972) i altres han criticat que la teoria assumeix de forma poc realista que totes les persones grans necessiten i desitgen uns elevats nivells d'activitat social (Maddox, 1965).

Si la teoria de l'activitat manté que uns elevats nivells d'activitat social estan estretament vinculats al benestar de les persones grans, la *teoria de la desvinculació* sosté que la vellesa és -i ha de ser- un període en què l'individu que envelleix i la societat se separen recíprocament. Es tracta d'una teoria molt ben estructurada que, en el seu origen, a través d'una mostra representativa de la població de Kansas, ens mostrava l'evidència empírica d'una progressiva disminució de l'activitat social, grau d'implicació psicològica i funcionament físic durant el procés d'envelliment. És a partir d'aquest anàlisi que es proposa la "desvinculació" com un procés suposadament natural, universal, amb fonaments biològics i com una part necessària del cicle vital, atès que evita que la

desaparició natural d'un individu tingui repercussions negatives per al sistema, contribuint al necessari relleu social entre generacions (Cumming i Henry, 1961). Tanmateix, si bé les dades dels precursors de la teoria de la desvinculació permetien afirmar que les persones grans mantenien un mateix nivell de benestar psicosocial a mesura que es desvinculaven de la seva vida social, estudis posteriors van refutar aquests resultats obtenint-ne d'oposats (Bengtson 1969). D'aquesta manera, la comparació de les fortaleses i debilitats de les teories de l'activitat i de la desvinculació passava de basar-se en la contraposició dels seus principis abstractes a la contrastació a partir de dades empíriques.

Sembla que la proposta de la isolació social progressiva com a element central d'un procés d'envelliment òptim que s'atribuïa a la teoria de la desvinculació no resultava acceptable intuïtivament, ni tampoc moralment. Això va propiciar diferents intents de refutació. En aquesta línia, la *teoria de la continuïtat* sorgia com una variant de la teoria de l'activitat que pretenia superar els punts febles d'aquesta, això és, considerar que el benestar de les persones depèn de que aquestes mantinguin una elevada activitat social. La seva premissa bàsica és la inexistència d'una ruptura entre l'edat adulta i la tercera edat. Aquesta es concep essencialment com una prolongació d'experiències, projectes i habilitats de l'etapa anterior, provocant que la personalitat i el sistema de valors es mantinguin intactes (Lowenthal, 1975). Aquesta teoria ha estat confirmada per la recerca posterior, però tan sols de forma parcial. Alguns autors han detectat que aquesta continuïtat es dona en determinats comportaments socials com, per exemple, l'assistència a actes religiosos però no en d'altres com, per exemple, les activitats d'oci (Agahi et al., 2006). Per altra banda, la teoria de la continuïtat ha obtingut suport empíric a l'hora d'avaluar les diferències que es donen entre individus, mentre que no ha obtingut aquest mateix suport a l'hora d'analitzar les fluctuacions intraindividuals (Wang et al., 2011).

A diferència de la teoria de la continuïtat, la *teoria de la selectivitat emocional* no pretén refutar la teoria de la desvinculació i malgrat no tenir com a objectiu justificar els seus postulats, recupera la defensa d'una contracció de les connexions socials a mesura que la gent es fa gran. Aquesta teoria és pròpia de la psicologia i proposa que les persones grans i aquelles que tenen, per motius de salut, una curta esperança de vida tendeixen a eludir els factors emocionalment negatius o de risc del seu entorn i a centrar-se exclusivament en aquells factors emocionalment positius i segurs (Carstensen, 2006). Aquest efecte provocaria una reducció en la mida de la xarxa social com a conseqüència

de la priorització dels aspectes qualitatius d'aquesta. Aquesta teoria, per tant, podria explicar perquè els sentiments de soledat no s'acostumen a trobar fortament associats a la mida de les xarxes socials en estudis epidemiològics de poblacions de persones grans (Cornwell i Waite, 2009). Tanmateix, malgrat destacar els aspectes positius d'una certa reducció de les connexions socials, els partidaris d'aquesta teoria reconeixen que la soledat i la isolació social en un sentit objectiu són problemes socials d'una elevada prevalença i amb unes conseqüències negatives per a la qualitat de vida de les persones grans (Leigh-Hunt et al., 2017).

1.2.2.-Teories estructuralistes

A diferència de les teories psicosocials, les teories estructuralistes no pretenen prescriure un model òptim de desenvolupament psicosocial sinó comprendre els diferents aspectes contextuals que afecten el benestar de les persones grans. Ofereixen la possibilitat de comprendre els condicionants qualitatius del procés d'envelliment a través de diferents factors estructurals -polítics, socials, culturals o econòmics- que poden presentar diversos efectes en les diferents etapes vitals. Algunes d'aquestes teories se centren en aspectes que afecten de forma independent a les persones grans, com ara l'estigma, mentre que altres prenen en consideració l'efecte acumulatiu de les desigualtats socials al llarg del cicle de la vida.

La crisi paradigmàtica entre els partidaris de les teories de l'activitat i els de la desvinculació va conviure amb el sorgiment de la *teoria de la modernització,* que podem considerar com la primera teoria de caràcter estructuralista (Cowgill i Holmes, 1972). La seva premissa fonamental és la consideració de l'estatus i el benestar de les persones grans com a inversament proporcionals al nivell d'industrialització de les societats; la qual cosa explicaria perquè les persones grans eren més valorades en les societats rurals asiàtiques que en la societat nord-americana, per fer servir els exemples dels precursors de la teoria. El fet que les societats rurals estiguin més fonamentades en la tradició podria explicar que les persones grans no es vegin sotmeses a l'estigma que es dona en les societats industrialitzades, on factors com l'educació de masses o la modernització tecnològica propiciarien un augment en la distància social entre generacions que facilitaria l'estigmatització (Cowgill, 1974). Malgrat tractar-se d'una teoria que aconseguia superar la contraposició entre les dues teories hegemòniques gràcies a la introducció d'un nou factor explicatiu, la premissa segons la qual el benestar de les persones és inversament

personal al grau de modernització no va rebre suport empíric per part de la recerca posterior, que va arribar a obtenir resultats contraris (Bengtson et al., 1975). Així, la teoria de la modernització va esdevenir un front més en la crisi paradigmàtica de la gerontologia social.

A diferència de la teoria de la modernització, la perspectiva de l'*estratificació per edats* no se centra exclusivament en el context sociocultural, sinó que també considera fonamental el context socioeconòmic i proposa donar a ambdós la mateixa importància. En aquest cas, no s'avaluen les possibles diferències culturals que es donen entre societats, sinó que es proposen unes hipotètiques divisions socials en categories de franges d'edat que proporcionen identitat, impliquen diferències conductuals i, al mateix temps, condicionen la distribució dels recursos. Es tracta d'una interdependència entre les cohorts d'edat i l'estructura social que es troba en constant procés de canvi (Riley, 1972). Una important aportació coherent amb aquesta perspectiva és el concepte de "retard estructural", el qual es dona quan les estructures socials no poden mantenir el ritme dels canvis en les necessitats d'una població dinàmica. L'exemple concret que s'utilitza és el problema de la conciliació entre la vida familiar i laboral: les pressions del mercat laboral impossibiliten el servei de cura intrafamiliar a una població de persones grans en estat de dependència creixent i sense serveis de cura alternatius a l'abast (Riley, 1994).

La interacció entre cohorts d'edat i estructura social que planteja la teoria de l'estratificació per edats, sembla centrar l'atenció dels partidaris de les teories del *contructivisme social* tot i que, en aquest cas, s'obvia -o es deixa en un segon terme- el context socioeconòmic. Mentre la teoria de l'estratificació per edats proposa la distribució de recursos com un dels elements centrals per entendre la relació entre les diferents franges d'edat i de cadascuna d'aquestes amb l'estructura social, les teories constructivistes tracten d'explicar de quina manera la vellesa es construeix socialment en el pla cultural. Segons les seves propostes, els individus participen activament en la seva vida quotidiana, creant i mantenint significats socials per a ells mateixos i per als que els envolten. Aquests "processos socials d'interacció" es poden veure com a dialèctics: el comportament individual produeix una "realitat" que al seu torn estructura o condiciona les vides individuals (Dannefer i Perlmutter, 1990). Els seus crítics consideren que aquestes explicacions són de tipus metafísic, difícilment refutables o ratificables i que representen un retorn a l'atomisme que semblava superat des de la integració de les teories estructuralistes en la gerontologia social. En aquesta línia, s'assenyala que el

constructivisme prescindeix dels efectes a nivell macro, com ara període històric, estratificació per franges d'edat i, particularment, estructura social com una variable objectivable i amb un clar efecte sobre les condicions de vida i el comportament humà (Baars, 1991).

Si bé la perspectiva de l'estratificació per edats i, en menor mesura, les teories constructivistes són útils per comprendre les diferències que es donen entre les diferents franges de edat o de quina manera aquestes es relacionen entre si, la *teoria del curs de la vida* propicia la comprensió de l'envelliment com un procés progressiu en què les etapes inicials del cicle vital condicionen les etapes posteriors. Parteix de l'anàlisi dels diferents condicionants socials i psicològics que es donen durant totes les etapes de la vida -des de la infantesa fins a l'edat adulta- per tal de comprendre les circumstàncies de les persones grans (George, 1996). Es tracta d'una perspectiva multidisciplinària que pretén explicar de quina manera temps, període i cohort donen forma als processos d'envelliment dels individus i dels grups socials (Elder, 1992). A partir de la perspectiva del curs de la vida, s'han desenvolupat diversos models complementaris entre ells (Ben-Shlomo i Kuh, 2002) i dels quals en destaquem dos: per una banda, l'anomenat model del "període crític", que es focalitza en respondre de quina manera les tensions adverses en diverses etapes de la vida -com l'etapa fetal i la primera infància- poden alterar els processos de desenvolupament de cada individu i determinar-ne la salut en l'edat adulta (Glover, 2015), i, per l' altra, el model de l'acumulació d'avantatges i desavantatges, que se centra en explicar com unes condicions de vida precàries durant la infantesa poden tenir un efecte en el benestar durant l'edat adulta a través del manteniment de les desigualtats socioeconòmiques durant les diferents etapes vitals (Luo i Waite, 2005).

Els paràmetres teòrics i metodològics de la teoria del cicle de la vida sovint complementen els de l'anomenada *gerontologia crítica*, que es composa d'un conjunt de perspectives que tenen en comú comprendre de quina manera el context social, en un sentit ampli, afecta el procés d'envelliment. Els objectius de la gerontologia crítica han estat quantificats i explicitats. Poden presentar-se sintèticament com el següents: 1) teoritzar sobre diferents dimensions de l'envelliment a nivell objectiu i subjectiu; 2) focalitzar-se en el canvi social; 3) posar en contacte acadèmics i professionals a través de la praxis; i 4) produir "coneixement emancipador" (Moody, 1993). Aspectes com la classe social, el gènere, l'etapa històrica i les polítiques públiques són elements cabdals de la gerontologia crítica.

L'economia política de l'envelliment és considerada la perspectiva central de la gerontologia crítica i posa l'èmfasi en explicar en quin sentit l'estatus, la distribució dels recursos i la trajectòria del propi procés d'envelliment estan condicionats per les relacions entre classes socials, que limiten les oportunitats i la capacitat d'elecció. L'Estat és qui organitza les relacions de classe a través de l'estat del benestar o altres formes d'estat social, que són conseqüència del resultat de les lluites socials en un moment històric determinat (Minkler i Estes, 1999). Així, el significat social de fer-se gran queda vinculat a la realitat històrica, política, econòmica i social que el contextualitza: si bé en les dècades posteriors a la Segona Guerra Mundial, en els països de capitalisme avançat l'envelliment es va ordenar a partir de les institucions socials vinculades a la jubilació i a l'estat del benestar, ja sigui com a conseqüència de la crisi del petroli de 1973 -i de les posteriors, incloent la crisi financera del 2008- que, suposadament, han limitat els recursos disponibles per al finançament de la tercera edat, o com a resultat d'uns processos estructurals i ideològics més amplis associats a la globalització i al neoliberalisme -amb especial èmfasi després de la caiguda del bloc soviètic-, en la fase actual la "nova vida" que havia significat la tercera edat, entesa com una etapa vital en la que apareixien noves oportunitats per a la realització personal després de la fi del treball a temps complet, recupera progressivament molts vestigis de la "vella" en referència a la reproducció de les mateixes desigualtats socials (Phillipson, 1998).

1.2.3.-Models d'envelliment reeixit

Els models d'envelliment reeixit que tenen més acceptació en les discussions teòriques contemporànies recuperen alguns paràmetres de les propostes "psicosocials" i intenten prescriure un model d'envelliment. En aquest cas, però, el procés d'envelliment no es desvincula del context estructural sinó que l'objectiu de la prescripció és aproximar-se a la comprensió dels factors socials que condicionen la qualitat de l'envelliment per tal d'impulsar intervencions sociopolítiques que permetin una major prevalença del model d'envelliment òptim. En aquest sentit, l'epidemiologia social, sent la branca de l'epidemiologia que estudia la distribució social i els determinants socials de la salut (Berkman i Kawachi, 2000), passa a estar estretament vinculada a la gerontologia social.

Tot i que existeixen diferents propostes per a referir-se a la noció d'"envellir bé", ja sigui envelliment "actiu", "òptim", "productiu" o els conceptes de generativitat o resiliència (Hicks i Conner, 2014), segurament el terme més utilitzat ha estat el

d'envelliment reeixit (successful ageing). Rowe i Khan van ser els primers en articular de forma convincent les condicions que hauria de complir un procés d'envelliment individual per a ser potencialment considerat com a reeixit: absència de patologies cròniques en la condició física, elevat rendiment en el funcionament cognitiu i físic, i la implicació en activitats socials i productives (Rowe i Kahn, 1998). Des de llavors, s'han proposat varis models alternatius des de tres perspectives: la biomèdica, la psicosocial i la biopsicosocial, que combina les dues primeres (Cosco et al., 2013).

El caràcter marcadament positivista de les definicions d'envelliment reeixit fa que no estiguin exemptes de crítiques similars a les que van rebre les primeres teories pel fet de pressuposar una única manera d'envelliment "correcte". Per altra banda, els estudis que han comparat models biomèdics i psicosocials han mostrat que no comparteixen correlats inclús en comparar models del mateix tipus (Bowling i Dieppe, 2005; Depp i Jeste, 2006), la qual cosa suggereix la necessitat d'examinar els components separadament per tal d'entendre com l'entorn afecta a cadascun d'ells i poder establir prioritats a l'hora de plantejar les intervencions. Tanmateix, la metodologia associada als models d'envelliment reeixit pot aportar una perspectiva multinivell en relacionar l'estructura social amb el procés d'envelliment individual, la qual cosa requereix un esforç per tal d'unificar criteris, definicions i eines de mesura que possibilitin la comparació de resultats en diferents contexts històrics, polítics, socials i econòmics.

Partint d'aquestes consideracions, el present treball d'investigació se centra en un dels principals components dels models psicosocials d'envelliment reeixit com és la soledat (Kok et al., 2015), que té l'avantatge de no estar necessàriament vinculada a la mida de la xarxa social i, per tant, superar la contraposició existent entre les teories psicosocials contractives i expansives de la gerontologia social: sentir-se sol és una sensació inqüestionablement negativa, independentment de les interaccions socials disponibles en un sentit objectiu, com ho demostra la seva estreta relació amb la depressió (Cacioppo et al,, 2006). Ambdós condicions -soledat i depressió- són l'objecte d'estudi del present treball d'investigació que tractarà d'aproximar-nos a la comprensió dels seus condicionants socials a través de la metodologia que ens ofereix l'epidemiologia social en el context de l'estudi dels condicionants socials de la salut mental.

1.3: Condicionants socials de la salut mental

L'Organització Mundial de la Salut defineix la salut mental com "un estat de benestar en el qual cada individu s'adona del seu propi potencial, pot fer front a les tensions normals de la vida, pot treballar de forma productiva i fructífera, i és capaç de contribuir a la seva comunitat" (Allen et al. 2014). Una mala salut mental no inclou necessàriament la presència de trastorns mentals, que són patologies precisament diagnosticades a través d'indicadors simptomatològics. A mode de resum, els trastorns mentals són l'ansietat i la depressió -anomenats trastorns mentals comuns-, l'esquizofrènia i el trastorn bipolar -anomenats trastorns mentals greus- i les addiccions. Tanmateix, moltes persones presenten simptomatologia pròpia dels trastorns mentals que no arriben al llindar per a ser diagnosticats com a tals, malgrat comprometre la seva salut mental. Els trastorns mentals i els trastorns mentals subclínics són freqüents en tots els països i franges d'edat (Allen et al. 2014).

Existeix un ampli consens entre la comunitat científica sobre la implicació de factors socials, econòmics i ambientals en la configuració de la salut mental i de molts trastorns mentals. D'entre les causes de les desigualtats en salut es consideren fonamentals les relacionades amb l'estatus socioeconòmic, que inclou els factors socials i econòmics que determinen la posició jeràrquica d'un individu en la societat. Els factors tradicionals que s'utilitzen per a aproximar-se a l'estatus socioeconòmic en epidemiologia social són: educació, ocupació i ingressos. Cada component d'estatus socioeconòmic proporciona diferents recursos, mostra diferents relacions amb diversos aspectes relacionats amb la salut i ha de ser abordat de diferent manera (Lynch i Kaplan, 2000).

Existeixen diferents propostes d'explicació causal sobre la relació entre estatus socioeconòmic i salut mental de forma que cadascuna de les concepcions fonamenta una teoria substantivament diferent. Així, segons la *teoria del comportament*, un baix nivell socioeconòmic i, particularment, un baix nivell educatiu, estaria relacionat amb un augment de risc d'estils de vida poc saludables, com el sedentarisme o el consum d'alcohol i tabac (Brunello et al., 2015). Des d'*enfocaments materialistes* es posa l'accent en el desigual accés al sistema sanitari i la diferent exposició a la privació material (Helfin i Iceland., 2009). Les *teories psicosocials* sostenen que un baix nivell socioeconòmic s'associa a una major probabilitat d'aïllament social, soledat, i compromís cívic.

Finalment, des d'una *perspectiva biomèdica* les desigualtats en salut són conseqüència d'una diferent exposició a entorns estressants i a agents contaminants o nocius, sovint generada per una diferent distribució de la precarietat i la seguretat laboral (Adler i Newman, 2002).

Tot si ser el factor fonamental, l'estatus socioeconòmic no és l'únic factor social que influeix en les desigualtats en salut; existeixen altres condicionants demogràfics, ambientals i culturals que malgrat poder estar correlacionats entre ells i també amb l'estatus socioeconòmic o bé les seves conseqüències en salut es poden veure agreujades per aquest, també poden tenir un efecte independent en la configuració de la salut mental. En una recent "revisió de revisions", Lund et al. (2018) van integrar tots aquest aspectes desenvolupant un marc conceptual dels determinants socials de la salut mental a través de la identificació dels dominis clau.

La revisió va seguir l'*enfocament ecològic* de Bronfenbrenner (1979) en vincular cada domini a determinants "proximals" (referits a persones, objectes o esdeveniments que existeixen en l'entorn immediat de l'individu i que li provoquen un augment o una reducció del risc de trastorns mentals) i "distals" (en referència a tendències estructurals més àmplies que exerceixen la seva influència, sovint a través de factors proximals, en la prevalença dels trastorns mentals a nivell poblacional). A la Taula 2, s'exposen els diferents dominis amb els seus corresponents factors distals i proximals.

Domini	Factors distals	Factors proximals
Demogràfic	-Diversitat comunitària -Densitat de població -Longevitat i esperança de vida	-Gènere -Edat -Ètnia
Econòmic	-Recessions econòmiques -Desigualtat -Política macroeconòmica	-Ingressos -Dificultats financeres -Precarietat laboral i atur
De barri	-Infraestructura -Privació -Ambient construït	-Seguretat i protecció -Tipus d'habitatge -Superpoblació
Ambiental	-Desastres naturals -Canvi climàtic -Guerres i conflictes -Migracions forçoses	-Trauma -Estrès
Social i cultural	-Capital social comunitari -Estabilitat social	-Capital social individual -Participació cívica -Suport social -Educació

Taula 2. Determinants socials de la salut mental. Lund et al. (2018)

El *domini demogràfic* inclou les característiques que augmenten o disminueixen el risc de malalties mentals, com el gènere, l'edat, l'ètnia, l'esperança de vida i la longevitat. Els rols de gènere socialment assignats semblen afectar de diferent manera els principals factors de risc, incloent exposició a esdeveniments estressants, estratègies d'afrontament, relacions socials, recursos personals i vulnerabilitat emocional (Rosenfield i Mouzon, 2012). Així, el gènere femení s'associa amb el risc de depressió major (Musliner et al., 2016), ansietat (Baxter et al., 2013) i desordres alimentaris (Qian et al., 2013), mentre que el gènere masculí s'associa al risc d'addicció a substàncies (Cheng et al., 2015) i a desordres en el comportament i en el desenvolupament psicosocial durant la infantesa (Bale et al., 2015; Merikangas et al., 2009). Per altra banda, l'augment de la prevalença de trastorns mentals en grups minoritaris pot ser conseqüència d'experiències de discriminació i exclusió, d'antecedents genètics o d'una diferent interpretació cultural de la simptomatologia (Dealberto, 2011; Gilliver, 2014). A nivell específic, formar part d'un grup minoritari està significativament relacionat amb un augment del risc de psicopatologies (Dealberto, 2011), i amb l'ansietat i amb la depressió durant la infantesa i l'adolescència (Gilliver et al., 2014). Entre les persones migrades, factors com el país d'origen i de destinació, o els motius de la migració, modifiquen l'efecte de la condició de persona migrant sobre la salut mental (Bourque et al., 2011).

El *domini econòmic* inclou els factors relacionats amb la producció, el consum i la transferència de riquesa, significativament relacionades amb la salut mental, com ingressos de la llar, despeses, deutes, actius, seguretat alimentària, situació laboral, habitatge, dificultats financeres i aspectes macroeconòmics com les recessions o la desigualtat. La pobresa es troba estretament associada amb l'augment de la prevalença de trastorns mentals, com la depressió i l'ansietat, en països de renda baixa, mitjana i alta; tot i que els efectes varien segons la situació econòmica conjuntural del país (Lund et al., 2010). En els països de renda baixa i mitjana, l'empobriment individual i la desocupació s'associen a la ideació i al comportament suïcides, mentre que en països de renda alta aquesta associació no és tan clara (Iemmi et al., 2016). A nivell macroeconòmic, la recessió s'associa amb un major risc de depressió, ansietat, suïcidi i abús d'alcohol, principalment a través del seu efecte sobre l'ocupació, els ingressos individuals, la inseguretat i la desarticulació de vincles socials (Catalano et al., 2011). En referència a la desigualtat, els països més desiguals presenten una major prevalença d'esquizofrènia (Burns et al., 2014), depressió, ansietat, abús de substàncies i una disminució de la felicitat

(Bouffard i Dubbe, 2013). El benestar infantil també es troba associat a nivells baixos de desigualtat en ingressos, particularment en països de renda alta (Pickett et al., 2006).

El *domini de barri* inclou les característiques d'una àrea o comunitat que són factors de risc o protectors de trastorns mentals no atribuïbles a les característiques individuals dels membres de la comunitat, com la seguretat, la privació ambiental, l'accés a instal·lacions recreatives i la disponibilitat de serveis. La privació socioeconòmica a nivell de veïnatge està fortament associada a l'augment de la prevalença de trastorns psicòtics (O'Donoghue et al., 2006), depressió (Julien et al., 2012), trastorns mentals comuns en persones joves (Curtis et al ., 2013) i la reducció de la funció cognitiva en persones grans (Wu et al., 2015). Per altra banda, la vida en un entorn urbà augmenta el risc de desenvolupar esquizofrènia (Cantor-Graae, 2007) i ansietat (Peen et al., 2010) en comparació amb la vida en un entorn rural. Alguns investigadors han proposat explicacions causals de la relació entre l'entorn físic del barri i la salut mental a través de factors de mediació com ara un increment en les oportunitats d'interacció i en l'accés al suport social (Evans, 2003) o una major prevalença d'hàbits saludables com ara l'activitat física i una alimentació adequada (Diez i Mair, 2010).

El *domini d'esdeveniments mediambientals* inclou les catàstrofes ambientals, que provoquen interrupcions greus en el funcionament d'una comunitat que veu superada la seva capacitat per afrontar les necessitats socials amb els recursos disponibles provocant un canvi en la prevalença dels trastorns mentals (United Nations, 2009). Exemples de catàstrofes ambientals són els desastres naturals o ecològics, conflictes armats i desplaçaments, i el perill que suposa per als ecosistemes aspectes com el canvi climàtic o l'augment de la població. Tots aquests esdeveniments estan fortament associats al trastorn d'estrès posttraumàtic, a l'ansietat i a la depressió. Els supervivents d'aquest tipus de catàstrofes presenten entre tres i quatre vegades més risc de patir un d'aquests trastorns que la població general (Goldman et al., 2014). Per altra banda, els desordres conductuals i emocionals, l'alteració de la son i els símptomes psicosomàtics són comuns entre els nens exposats a guerres, terrorisme i desplaçament forçós, malgrat que l'entorn familiar pot actuar com a moderador de l'efecte (Slone i Mann., 2016).

Finalment, el *domini social i cultural* inclou aquells factors propis de l'organització de la societat i de les interaccions socials que afecten la salut mental, com ara les relacions familiars o entre iguals, el capital social, les xarxes socials, la pertinença

a grups, l'educació o la cultura. Els efectes positius de l'educació sobre la reserva cognitiva i la resiliència comporta que els nivells més baixos d'educació i alfabetització estiguin fortament relacionats amb el desenvolupament de la demència (Beydoun et al., 2014) i la depressió (Chang-Quan et al., 2010). Tanmateix, els nivells més alts d'educació podrien estar associats a una progressió més ràpida dels problemes de salut mental (Bennett et al., 2014). Respecte les relacions socials, l'aïllament social, la poca empatia i la mancança de suport emocional augmenten el risc de trastorns mentals comuns en general (Ehsan i Silva, 2015) i de pensaments i comportaments suïcides en dones (Kazan et al., 2016).

Durant les darreres dècades, ha augmentat l'interès per l'efecte del capital social en la salut (Moore i Kawachi, 2017). El concepte de capital social requereix uns aclariments conceptuals. Si bé segons Coleman -un dels precursor del concepte- el capital social és "un bé públic, que beneficia a tots aquells que formen part d'una estructura, i un actiu potencial per als més desfavorits" (Coleman, 1990), estudis previs distingiren entre el capital social comunitari o contextual i el capital social cognitiu o individual. El capital social comunitari -com el capital social de barri-, ha estat definit com el conjunt de recursos socials inherents a les xarxes comunitàries que poden ser classificats en quatre components fonamentals: suport social, influència social, control social informal i participació i organització comunitàries (Carpiano, 2006). En canvi, el capital social individual (o cognitiu) es refereix a aquelles mesures que avaluen les percepcions de confiança, reciprocitat i suport entre les persones (Harpham et al., 2002). Segons la darrera revisió sistemàtica disponible, publicada al 2015, existeix una àmplia evidència segons la qual el capital social cognitiu és protector contra el desenvolupament del trastorns mentals comuns. En canvi, l'evidència és més limitada en el que es refereix a la relació entre el capital social comunitari i la prevalença dels trastorns mentals comuns (Ehsan i De Silva, 2015).

En conjunt, els autors subratllen les dificultats d'esquivar les constriccions de l'estructura social durant el curs de la vida. D'aquesta manera el context sociodemogràfic, cultural i socioeconòmic que es dona en el moment de néixer condiciona en gran mesura els esdeveniments posteriors, tot i que aquest condicionament varia segons el país i les diferents estructures socials, polítiques i econòmiques. Per tant, la teoria del curs de la vida, abordada des de les perspectives que ens ofereix la gerontologia crítica, ens

proporcionaran un punt de partida òptim per tal d'aproximar-nos a la comprensió dels condicionants social de la salut mental en persones grans.

1.3.1.-Teoria del curs de la vida

Segons l'Organització Mundial de la Salut, l'anàlisi de l'exposició sobre el curs de la vida es refereix a processos dinàmics d'influències negatives i positives que s'acumulen al llarg del temps, influint en els atributs psicosocials, fisiològics i conductuals dels individus i provocant desigualtats en salut mental i física. Aquests processos d'acumulació suggereixen la necessitat d'actuar en totes les etapes de la vida a través de les institucions socials com l'escola, el mercat de treball i els sistemes de pensions, ja que aquestes tenen un impacte significatiu en la limitació de les opcions de la gent a l'hora de triar la seva pròpia vida i, per tant, una clara incidència en la salut general i el benestar de la població (Allen et al., 2014).

Les condicions adverses en la infantesa s'associen a un major risc de trastorns mentals (Hughes et al., 2017). La negligència en la cura dels nens, l'estar exposats a abús físic i psicològic i la seva criança en famílies amb violència domèstica són realitats especialment perjudicials (Fryers et al., 2013). Les experiències estressants durant la primera infantesa afecten els sistemes reguladors d'estrès biològic, que són mecanismes neuronals mitjançant els quals es regulen les respostes a l'estrès i que estan estretament relacionats amb la salut mental. Aquest efecte pot ser amortitzat pel suport social de l'entorn immediat a través de l'establiment d'una connexió segura entre el nen i els cuidadors que és essencial per al seu desenvolupament social i emocional. En general, la criança en entorns segurs i emocionalment equilibrats esdevé fonamental per a l'individu en facilitar una resposta adequada a les experiències estressants i contribuir a una bona salut mental durant tot el cicle vital (Kieling et al., 2011; Hughes et al., 2017).

Precisament perquè els primers anys del desenvolupament del cervell condicionen en bona mesura resultats posteriors, es necessiten formes de suport continuades i adequades durant la infància i l'adolescència. A mesura que els nens es converteixen en adolescents es tornen més interessats a assumir riscos, incloent-hi el consum de substàncies tòxiques (Casey et al., 2008). És important assegurar que els adolescents tinguin el coneixement adequat per a prendre decisions informades i que comptin amb factors de protecció que incloguin el suport social i emocional, així com interaccions

positives amb els companys, la família i la comunitat en general. Els símptomes depressius entre els adolescents s'associen tant amb les experiències adverses que es van donar durant la infantesa com amb les experiències posteriors (Hughes et al., 2017; Casey et al., 2008).

Les persones que es troben en edat de treballar també compten amb factors de risc específics de trastorns mentals. Existeix una estreta associació entre la pèrdua de llocs de treball i els símptomes de depressió i ansietat (Catalano et al., 2011). Per tant, els agents polítics, econòmics (particularment, empresarials) i socials tenen una responsabilitat fonamental en la configuració de la salut mental de la població. Les estratègies per reduir l'atur a llarg termini són especialment importants per a reduir el risc de trastorns mentals (Paul i Moser, 2009), mentre que reduir l'ocupació precària, com ara l'ocupació sense contractes o contractes a curt termini, pot comportar una millora en la salut general de la població (Benach et al., 2016).

La salut mental de les persones grans es refereix tant a experiències vitals anteriors a la jubilació com a experiències, condicions i contextos específics de l'envelliment en el període posterior. L'evidència apunta a què les desigualtats en salut mental tenen tant a veure amb esdeveniments de transició, com la jubilació o la viudetat, com amb l'estatus socioeconòmic assolit durant el curs de la vida o amb la salut física que, en si mateixa, també està condicionada pels mateixos factors socioeconòmics (Allen, 2008). L'aïllament social entre les persones grans és particularment prevalent (Yang i Victor, 2011) i és un robust factor de risc de desenvolupar trastorns mentals. Tanmateix, les característiques objectives de les relacions socials individuals, com ara l'aïllament social, no són els únics factors relacionats amb les interaccions socials que presenten un efecte sobre la salut mental, sinó que els aspectes subjectius també presenten un clar impacte, sovint de forma independent als aspectes objectius. En aquest sentit, una revisió de la literatura mostra vincles entre la solitud -o aïllament social subjectiu- i els símptomes depressius, la cognició, l'alcoholisme, la ideació suïcida, la mala salut mental en general i la mortalitat precoç per totes les causes (Forsman et al., 2011). Finalment, les prevalences de trastorns mentals varien segons el país i les diferents estructures socials, polítiques i econòmiques. Els països escandinaus semblen tenir nivells més alts de salut mental entre les persones grans, seguits pels països d'Europa central, mentre que Itàlia, Grècia i Espanya presenten les prevalences més elevades de trastorns mentals (Grundy et al., 2013).

1.4: Depressió

El trastorn depressiu major (TDM) és una malaltia debilitant que es caracteritza per almenys un episodi depressiu discret que té una durada mínima de 2 setmanes i que implica tristesa i anhedonia, és a dir, una disminució en l'estat d'ànim i la pèrdua d'interès o incapacitat de sentir plaer (Whiterfor et al., 2013). A més d'aquests símptomes, segons la classificació del DSM-5 (American Psychiatric Association, 2013), per a què un individu sigui diagnosticat de depressió major ha de comptar, a més, amb tres dels següents símptomes:

- Alteracions de la gana o important augment o pèrdua de pes sense fer dieta.
- Insomni o hipersòmnia.
- Acceleració o retard psicomotriu.
- Fatiga o pèrdua d'energia.
- Sentiments d'inutilitat o culpa excessiva, que podria arriba a ser delirant.
- Indecisió o disminució de la capacitat de pensar o concentrar-se.
- Pensaments recurrents sobre la mort, ideació, planificació o intents suïcides.

Els símptomes han de provocar malestar clínicament significatiu o deteriorament de la funcionalitat en les àrees socials, ocupacionals o relacionades amb altres tipus d'activitats diàries. L'episodi no ha de ser atribuïble als efectes fisiològics d'una substància o d'una altra condició mèdica i no ha de poder ser explicable per un trastorn esquizoafectiu, esquizofrènia, o altres trastorns psicòtics. Finalment, per a ser diagnosticat de TDM, l'individu no ha pogut presentar prèviament un episodi maníac, això és, un estat anormal caracteritzat per una elevada excitació, afectivitat i nivell energètic.

D'entre totes les condicions mèdiques, el TDM és el segon contribuent més important a la càrrega de malalties cròniques que provoquen "anys viscuts amb discapacitat" (Vos et al., 2015) i sovint s'associa a un augment en la prevalença d'altres complicacions mèdiques, com ara la diabetis mellitus, les malalties del cor i els accidents cerebrovasculars. Conseqüentment, la prevalença de TDM afecta a la disponibilitat de polítiques de benestar per la seva clara repercussió en la despesa de recursos sanitaris (Gabilondo et al., 2012). Per altra banda, es calcula que fins a un 50% dels 800.000 suïcidis anuals a tot el món es produeixen en el context d'un episodi de TDM (Otte et al., 2016).

Tot i que no disposem d'un coneixement complet de les seves causes i mecanismes, sabem que el TDM és el producte d'una interacció entre factors genètics i contextuals. Els esdeveniments vitals estressants, com els maltractaments sexuals, físics o emocionals durant la infantesa (Li et al., 2016) el dol o l'aparició de malalties cròniques, personalitat neuròtica, circumstàncies socials com la pobresa o l'atur, antecedents psiquiàtrics o abús de substàncies tòxiques (Vallejo-Ruiloba, 2015), estan fortament associats amb el risc de desenvolupar TDM. A nivell biològic, el TDM està associat a volums més petits de l'hipocamp, a canvis en l'activació o en la connectivitat de xarxes neuronals (Etkin et al., 2015) i, com succeeix en la majoria de trastorns mentals, amb alteracions en els principals sistemes neurobiològics que intervenen en la resposta a l'estrès (Kupfer et al., 2012). S'estima que l'aportació de la causalitat genètica és, aproximadament, del 35%, incloent factors hereditaris i mutacions (Flint et al., 2014).

El curs del TDM és pleomòrfic, amb variacions considerables en la remissió i la cronicitat. La durada mitjana de l'episodi varia entre 13 i 30 setmanes i aproximadament el 70–90% dels pacients amb TDM es recuperen en un any. No obstant això, en els centres d'atenció ambulatòria, el curs és menys favorable: només un 25% es recupera en menys de 6 mesos i més del 50% dels pacients encara tenen TDM després de dos anys. A més, després de la remissió de TDM, sovint queden símptomes residuals i part del deteriorament funcional. La possibilitat de recaiguda és molt elevada: al voltant del 80% dels pacients de TDM experimenten almenys dos episodis en la seva vida. Finalment, la trajectòria del curs del TDM en persones de mitjana i avançada edat sembla ser una mica menys favorable que en els pacients més joves (Otte et al., 2016). Existeixen dues opcions principals per a tractar el TDM: psicoteràpia i farmacoteràpia. Els episodis de depressió moderats o greus han de ser necessàriament tractats farmacològicament amb o sense psicoteràpia, mentre que un episodi de TDM lleu pot ser tractat tan sols amb psicoteràpia o, fins i tot, a través d'una estratègia inicial de seguiment sense cap tipus de tractament (Gelenberg, 2010).

Degut a la complexitat del curs del TDM, l'Organització Mundial de la Salut proposa la prevenció amb l'objectiu de reduir la incidència de TDM. Es poden distingir tres tipus de prevenció: 1) prevenció universal, orientada a la població general (escoles, llocs de treball, residències d'avis,...), 2) prevenció selectiva dirigida a persones exposades a factors de risc (nens amb antecedents paterns, pacients hospitalitzats,...), i 3) prevenció basada en la detecció precoç, dirigida a casos subclínics. Les estratègies

preventives han de ser presents durant les diferents etapes vitals ja que existeixen períodes de risc elevat repartits al llarg de tot la vida com per exemple l'adolescència o el període de postpart en dones. Les persones en edat productiva, segons sigui el seu context laboral, social o econòmic, poden trobar-se també en períodes de risc, normalment vinculats a canvis negatius, i requerir intervencions preventives. El moment de la jubilació és un altre període especialment crític. Finalment, també les persones grans s'enfronten, de forma particularment prevalent, a factors de risc de depressió com són el dol, la pèrdua de funcionalitat física o la soledat (World Health Organization, 2016).

Segons l'informe de l'Organització Mundial de la Salut (World Health Organization, 2016), les intervencions preventives més efectives es basen en la teràpia cognitiu-conductual (basada en incidir en la interacció entre conducta i pensament) o la teràpia de resolució de problemes (basada en la prescripció de pautes de comportament). Aquestes teràpies es poden oferir com a autoajuda guiada (biblioteràpia o *e-health*) acompanyada de, per exemple, trucades telefòniques setmanals d'un professional de la salut o un terapeuta; es poden posar a disposició dels pacients que visiten el seu metge de capçalera (Willemse et al. 2004); i han estat especialment efectives en persones grans amb simptomatologia depressiva subclínica, ja sigui en residències d'avis o en centres d'atenció primària (Van't Veer-Tazelaar et al., 2009). Altres tipus d'intervencions preventives que han estat proposades i avaluades en altres recerques són les relacionades amb el benestar físic i psicosocial en general, com ara el foment de l'exercici físic (Mammen i Faulkner, 2013) o d'activitats socials (Nagy i Moore, 2017).

1.4.1.-Epidemiologia de la depressió

Les investigacions epidemiològiques distingeixen entre els trastorns de depressió major (TDM) i els episodis de depressió major (EDM). Els EDM inclouen episodis depressius que es produeixen com a part d'un trastorn bipolar, caracteritzats per l'oscil·lació entre episodis maníacs i depressius. En canvi, el TDM exclou la depressió bipolar. Tot i que la majoria dels EDM són TDM, la depressió bipolar és considerablement més persistent que la depressió no bipolar (Merikangas et al., 2011) i, per tant, la proporció de casos d'EDM és superior a la de casos de TDM. En aquest treball utilitzem, a més, el terme "depressió" per a referir-nos indistintament a EDM, TDM o depressió subclínica. La prevalença de depressió acostuma a ser mesurada en diferents períodes. La prevalença-vida és el percentatge de persones que han patit, com a mínim, un episodi de depressió al llarg de

la vida, mentre que la prevalença-any és el percentatge de persones que l'han patit en els darrers dotze mesos. Altres mesures d'interès són l'edat en el primer episodi (edat d'incidència) i la depressió subclínica, sovint definida com un període de diversos dies consecutius -inferior a dues setmanes- presentant depressió, tristesa o anhedonia.

En una revisió sobre l'epidemiologia de la depressió en diferents cultures publicada al 2013 (Kessler i Bromet, 2013) es conclou que tot i no existir informació sobre la prevalença i els correlats de la depressió per a la majoria de països, les dades disponibles indiquen que hi ha una àmplia variabilitat en les estimacions de prevalença, mentre que altres aspectes epidemiològics, com l'edat d'incidència i la persistència del trastorn, presenten una elevada estabilitat entre països. A la Taula 3 es presenten prevalences i edat d'incidència d'EDM en diferents països europeus.

País	Subclínic-vida	Prevalença-vida	Prevalença-any	Edat d'incidència
Bèlgica	49,4 ±2,5	14,1±1,0	5,0±0,5	29,4 (20,9-41,3)
França	65,0±1,7	21,0±1,1	5,9±0,6	28,4 (19,3-38,9)
Alemanya	43,1±1,4	9,9±0,6	3,0±0,3	27,6 (18,6-39,6)
Itàlia	44,9±1,7	9,9±0,5	3,0±0,2	27,7 (19,1-39,1)
P. Baixos	53,2±1,6	17,9±1,0	4,9±0,5	27,2 (19,5-39,5)
Espanya	37,7±1,0	10,6±0,5	4,0±0,3	30,0 (19,7-44,3)

Taula 3. Prevalença (%) dels EDM segons el DSM-IV / CIDI als 6 països europeus que participen en les enquestes de World Mental Health Survey (Kessler i Bromet, 2013).

A Europa la prevalença-vida de EDM oscil·la entre el 9,9% d'Alemanya i Itàlia i el 21,0% de França, mentre que la prevalença-any oscil·la entre el 3,0% i el 5,9%. L'edat mitjana d'incidència presenta més estabilitat i oscil·la entre els 27 i els 30 anys. El fet que la prevalença-vida sigui de 2-3 vegades la prevalença-any, suggereix que entre un terç i la meitat de les persones que han patit un EDM durant la vida, tenen episodis recurrents en un any determinat. Es tracta, per tant, d'un elevat índex de persistència que dona una idea de l'abast de la cronicitat del trastorn mental.

Gairebé tots els estudis epidemiològics inclosos en la revisió reporten que sexe, edat i estat civil estan associats a la depressió. Les dones acostumen a presentar un risc de EDM més elevat, que arriba a ser dues vegades superior en comparació amb els homes (Haro et al., 2006). Les persones separades o divorciades presenten prevalences d'EDM

significativament més elevades que les casades. La prevalença de depressió generalment disminueix amb l'edat, malgrat que les persones grans presenten uns índexs de persistència més elevats (Andrade et al., 2003). Tanmateix, aquesta evidències provenen, principalment, d'estudis realitzats en països occidentals i les escasses dades disponibles sobre països de renda baixa o mitjana suggereixen que aquest patró podria dependre del context macroeconòmic (Kessler et al., 2013). A més, existeixen interaccions significatives entre gènere, estat civil i edat com a factors de risc de depressió. Segons un recent estudi longitudinal, les dones divorciades o vídues presenten una prevalença inferior de depressió que els seus homòlegs masculins. Per altra banda, la prevalença de depressió augmenta amb l'edat entre persones solteres (homes i dones), mentre que disminueix entre dones vídues, separades i divorciades (Bulloch et al., 2017).

1.4.2.-Condicionants socials de la depressió

Aquest apartat parteix d'una revisió bibliogràfica a través de la qual pretenem entendre de quina manera els dominics econòmic, de barri, ambiental i social i cultural -que hem pres com a marc conceptual en el cas general de la salut mental- afecten a la probabilitat de patir depressió. L'objectiu és revisar l'evidència sobre la relació entre els diferents factors de cada domini i la depressió, així com sobre les explicacions causals proposades. Com en el cas de la salut mental, la relació entre estatus socioeconòmic i la probabilitat de patir depressió pot ser explicada a través de les teories psicosocials, materialistes, biomèdiques i conductuals. Tanmateix, si bé els factors materials acostumen a ser identificats com el principals mediadors entre estatus socioeconòmic i salut mental en estudis que comparen les diferents teories (Moor et al., 2016), un estudi revela que, en el cas específic de la depressió, els factors psicosocials podrien ser el mediador més potent (Koster et al., 2006).

A nivell macroeconòmic, una recent revisió sistemàtica amb metaanàlisi (Patel et al., 2018) va mostrar que la desigualtat dels ingressos està associada a la prevalença de la depressió en la població general. El coeficient Gini és la mesura més utilitzada per a mesurar la desigualtat d'ingressos, i estudis previs suggereixen que el 0,3 és un llindar potencial per sobre del qual l'impacte de la desigualtat sobre la salut pot arribar a ser significatiu (Kondo et al., 2012). Una altra manera d'aproximar-se a l'efecte de la situació macro en la prevalença de depressió és a través de la comparació entre països segons models polítics. En aquest sentit, un recent estudi va detectar que aquells països europeus

que han aplicat polítiques d'austeritat com a resposta a la crisi financera del 2018 han augmentat la prevalença poblacional de depressió (Reibling et al., 2017).

Patel et al. (2018), plantegen els mecanismes que associen desigualtat i salut en base a tres nivells: individual, de barri, i nacional o regional. A nivell individual, els efectes de la desigualtat de la renda sobre la salut general estarien mediats per l'estrès psicològic (teoria biomèdica). A nivell de barri es plantegen dos tipus de mecanismes. El primer proposa que la comparació entre persones de diferent nivell socioeconòmic en un context altament desigual provoca, en les més desafavorides, sentiments de derrota social que s'associen amb la incidència de depressió (Buttrick i Oishi, 2017), es tracta d'un mecanisme exclusiu dels efectes de la desigualtat estructural en la depressió que no forma part de les teories tradicionals. En canvi, el segon mecanisme consisteix en la hipòtesi del capital social, que formaria part de les teories psicosocials, i es basa en l'argument que la desigualtat dels ingressos erosiona les relacions socials (Ichida et al., 2009). Finalment, a nivell nacional o regional, proposen la hipòtesi materialista segons la qual una major desigualtat dels ingressos coexisteix amb una àmplia gamma de privacions rellevants per a la salut.

A nivell microeconòmic, els ingressos de la llar presenten una clara relació amb la depressió: les persones més pobres tenen més probabilitat de patir-ne (Sareen i Afifi, 2011). Altres conceptes relacionats amb els ingressos a la llar, particularment els problemes financers, també presentarien una clara relació amb la depressió, fins al punt que alguns autors suggereixen que les dificultats financeres podrien ser conceptualment diferent dels ingressos de la llar en sentit estricte, ja que no només depenen del volum d'ingressos sinó també de la capacitat individual per viure amb els propis mitjans (Aneshensel, 2009). En aquest sentit, un estudi transversal amb una mostra representativa d'adults nord-americans va evidenciar que el control de les finances personals podria ser un factor protector contra la depressió, independentment dels ingressos (Zurlo et al., 2014). Altres aspectes del domini socioeconòmic, com l'atur (Catalano et al., 2011) o l'accés a l'assistència sanitària privada (Burstin et al., 1992), també han estat detectades com a significativament relacionades amb la depressió.

En referència al domini de barri, existeix una literatura relativament reduïda sobre l'associació entre l'ambient construït i la depressió. La comunitat científica no ha arribat a un consens sobre si són les característiques socioeconòmiques del barri (Barnett et al.,

2018) o bé les característiques físiques (Mair et al., 2008) les que s'associen amb major fortalesa amb la incidència de depressió. Entre les característiques físiques, tampoc queda clar quines són aquelles que presenten una relació significativa o més robusta amb aquest trastorn mental. Una revisió sistemàtica proposa que el soroll, la pol·lució i la baixa disponibilitat de zones verdes estan clarament relacionats amb la depressió, mentre que aquets relació no es dona en el cas de les facilitats per a passejar (*walkability*) i la disponibilitat de serveis; tot i que existeixen resultats contrastants (Mair et al., 2008). En el que sí que coincideixen vàries revisions és en assenyalar que l'associació entre l'ambient construït i la depressió requereix de més estudis que permetin millorar el coneixement sobre la matèria (Barnett et al., 2018; Julien et al., 2012).

A nivell ambiental, la prevalença de la depressió després de desastres naturals oscil·la entre el 5,8% i el 54,0% en adults, i el 7,5% i 44,8% en nens. Segons una revisió sistemàtica existeixen factors de risc específics i compartits per a nens i adults després de l'exposició a desastres naturals. Els factors compartits són trauma previ i haver passat por, lesions o dol durant el desastre; els factors específics són, en els cas dels adults, ser dona, no estar casat, tenir creences religioses, un baix nivell educatiu i haver perdut la feina o alguna propietat com a conseqüència del desastre. En el cas dels nens, els factors són quedar atrapat durant el desastre, assistir a un cas de lesió o mort durant el desastre, i tenir un baix suport social (Tang et al., 2014). En un estudi sobre la salut mental dels supervivents de la segona guerra mundial, focalitzat en persones grans que havien estat desplaçades durant la infantesa, es van indentificar relacions significatives entre experiències relacionades amb la guerra -com la privació o haver estat amenaçades- i la depressió entre totes les persones que van participar a l'estudi, haguessin estat desplaçades o no. Tanmateix, les que havien estat desplaçades van presentar una percepció significativament més negativa del seu estat de salut (Strauss et al., 2011).

Respecte al domini social i cultural, l'associació entre nivell educatiu i depressió ha estat proposada per varis investigadors com una relació intervinguda per factors conductuals, argumentant que una educació limitada estaria associada amb una menor exposició a la informació sobre els factors de risc de depressió (Adler i Newman, 2002; van Lenthe et al., 2004). Altres investigadors proposen mediacions alternatives a les tradicionals com les referides a l'habilitat -o la reserva- cognitiva, que estaria associada al nivell educatiu i actuaria com a factor protector de la depressió (Lara et al., 2017; Lee, 2011). A més de l'educació, el domini social i cultural també inclou indicadors sobre

l'entorn relacional. Totes les mesures relacionades amb les xarxes socials, com el capital social (cognitiu o estructural) (Forsman et al., 2012), el suport social (Gariépy et al., 2016), l'aïllament social (Taylor et al., 2018) o la soledat (Cacioppo et al., 2006b) han estat associades a la depressió. En els darrers anys l'interès en l'associació entre soledat i depressió s'ha multiplicat exponencialment (veure Figura 4) i és l'aspecte central del present treball d'investigació. Diversos autors han evidenciat una associació entre ambdós factors particularment robusta en persones d'edats mitjana i avançada que disminueixen de forma dràstica el seu benestar psicosocial i estat de salut general (Cacioppo et al., 2010; Dahlberg et al., 2014).
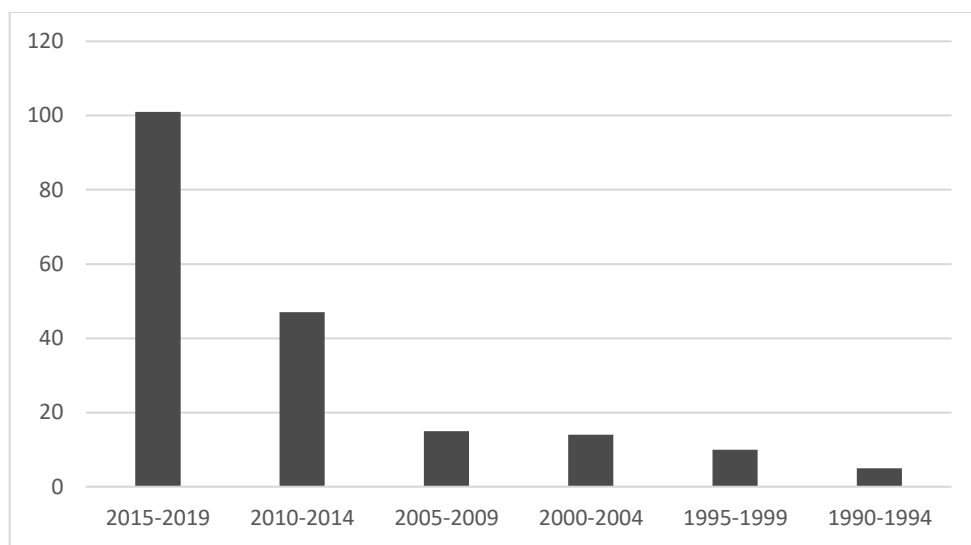
Figura 4. Número de publicacions sobre depressió i soledat des de 1990.
Font: Medline (Pubmed. Buscador: "lone* [ti] AND depr* [ti]". 13/4/2019)

En referència als mecanismes causals, a excepció de la teoria de la comparació social, que és una proposta destinada a explicar l'associació entre desigualtat estructural i depressió, la resta de teories que hem detectat -materialista, biomèdica, psicosocial, del comportament i de l'habilitat cognitiva- proposen la probabilitat de patir depressió com la conseqüència d'un dels indicadors d'estatus socioeconòmic (ingressos, ocupació o educació) -o del propi estatus socioeconòmic entès com una categoria social subjacent als indicadors socioeconòmics- que actua com a variable independent i que produeix el seu efecte sobre la salut mental a través de diferents variables de mediació. A la Taula 4 sintetitzem totes les teories plantejades amb les variables independents i mediadores associades.

Teoria	Variable independent	Variables de mediació
Teoria materialista	Ingressos	-Desigual accés al sistema sanitari. -Diferent exposició a la privació material.
Teoria biomèdica	Ocupació	-Entorns estressants. -Agents contaminants o nocius
Teoria psicosocial	Estatus socioeconòmic	-Exclusió social. -Aïllament, soledat
Teoria del comportament	Educació	-Estils de vida poc saludables
Teoria de l'habilitat cognitiva	Educació	-Baixa reserva cognitiva
Teoria de la comparació social	Desigualtat estructural	-Sentiments de "derrota social"

Taula 4. Teories sobre els mecanismes que associen condicions socials i depressió amb hipotètiques variables independents i mediadores associades.

1.4.3.-La depressió en persones grans

Tot i que el primer TDM acostuma a donar-se al voltant dels 30 o 40 anys, la prevalença d'incidència de TDM entre gent de 60 o més anys en poblacions generals ha arribat a estimar-se en un 13,3% (Beekman et al., 1999), malgrat que en la majoria d'estudis la prevalença acostuma a oscil·lar entre l'1 i el 5% (Blazer, 2003). Habitualment, quan ens referim a incidència de TDM després dels 60 anys, parlem de depressió durant la vida tardana (late-life depression, LLD) (Van Damme et al., 2018). La LLD es relaciona amb l'augment de la morbiditat, la disminució del funcionament físic, cognitiu i social, el suïcidi i la mortalitat precoç per totes les causes (McLaughlin, 2011). La LLD té un cost social particularment elevat també a nivell econòmic ja que la despesa en salut d'una persona gran amb depressió és 1,86 vegades superior a la d'una persona gran sense depressió (Bock et al., 2016).

Existeixen algunes propostes segons les quals la LLD té una relació particular amb els factors de risc psicosocials. Alguns investigadors suggereixen que les dificultats en curs tenen un efecte menor en el risc de depressió en les persones grans que en la resta d'adults. Per exemple, Forsell (2000) va demostrar que cap factor de base psicosocial preveia la depressió després de controlar la relació per esdeveniments passats. Per tant, com confirmen altres investigadors, són els esdeveniments de transició com, per exemple, la jubilació, la viudetat o l'inici d'una malaltia crònica, els que s'associen més

freqüentment amb la LLD, mentre que la resta de casos de TDM s'associen amb més freqüència a factors psicosocials en curs i persistents com, per exemple, els indicadors d'estatus socioeconòmic (Kennedy et al., 1990). Aquestes troballes són consistents amb la hipòtesi de supervivència: a mesura que les persones envelleixen i sobreviuen a l'exposició de factors de risc a llarg termini sense sucumbir a la depressió, disminueix la probabilitat d'una incidència associada a aquestes dificultats (Bruce, 2002).

La LLD també sembla distingir-se de la resta de casos de TDM per presentar una major presència de símptomes cognitius i somàtics. En comparació a la resta de casos de TDM, es dona una freqüència més elevada d'alteracions de la son, fatiga, alentiment cognitiu i psicomotor, anhedonia i desesperança i una habitual recurrència a queixes subjectives sobre la qualitat de la memòria i els problemes de concentració. Per altra banda, la LLD s'associa amb major freqüència a patologies orgàniques com trastorns demencials i patologia vascular, però amb menor freqüència a antecedents familiars. A més, entre els pacients de LLD es donen més casos de suïcidis consumats i la resposta a les teràpies és més lenta (Fiske et al., 2009).

És particularment robusta l'associació de la LLD amb el deteriorament cognitiu, malaltia cerebrovascular i declini cognitiu, incloent diferents tipus de demència degenerativa, com la malaltia d'Alzheimer (Butters et al., 2008). La naturalesa d'aquesta darrera associació no és clara i existeix un debat obert respecte si la LLD és un pròdrom -els símptomes inicials que precedeixen una malaltia-, una conseqüència o un factor de risc de demència. Els possibles mecanismes biològics que relacionen la depressió amb la demència inclouen la malaltia vascular, l'atròfia de l'hipocamp, canvis inflamatoris i dèficits en el sistema nerviós (Byers i Yaffe, 2011). Recents investigacions presenten resultats molt limitats sobre la LLD com a factor de risc modificable de demència i proposen les estratègies preventives com a eines més eficients (Almeida et al., 2017). Com en el cas de la salut mental general, cal incidir en els diferents factors de risc modificables durant les diferents etapes vitals per minimitzar l'adopció d'estils de vida poc saludables, la privació material, la desigualtat en l'accés al servei sanitari, l'exclusió social i l'aïllament i parar especial atenció als esdeveniments de transició. Finalment, és important destacar que les estratègies preventives ben dissenyades podrien presentar millors resultats a llarg termini que l'ús de medicaments antidepressius (Almeida, 2014).

1.5: Soledat

La definició de soledat més utilitzada data de 1981 i es refereix a "l'experiència desagradable que es produeix quan la xarxa de relacions socials d'una persona és percebuda com clarament deficient, ja sigui quantitativament o qualitativa" (Perlman i Peplau, 1981). Això inclou situacions en què el nombre de relacions, o en què aspectes qualitatius d'aquestes, no coincideixen amb les expectatives que la persona que pateix soledat s'ha creat. En aquest sentit, la solitud també ha estat definida com "aïllament social percebut" que es distingeix de l'aïllament social objectiu, referit a l'absència objectiva de vincles relacionals significatius, és a dir, vincles que proporcionen intimitat o sentiments de pertinença a un grup (Cacioppo, et al. 2009). Per tant, la solitud pot ser un dels possibles resultats de l'avaluació subjectiva de les relacions socials disponibles. Així, les persones socialment aïllades no senten necessàriament soledat, mentre que les persones que senten soledat no estan necessàriament aïllades en un sentit objectiu (Victor et al., 2000).

Diversos autors han focalitzat la seva recerca en relacionar la soledat amb diferents components de les xarxes socials. Alguns d'ells proposen que els quatre llaços més propers de la xarxa d'una persona proporcionen un elevat grau de protecció contra la soledat, mentre que els llaços restants proporcionen una protecció més limitada (Tilburg, 1990). Partint de l'anàlisi de grans xarxes socials, altres autors proposen que aquells individus que es posicionen en zones perifèriques tenen més probabilitat de patir soledat i que aquesta situació arriba a ser "pandèmica": els individus que senten soledat acostumen a relacionar-se amb un elevat percentatge d'individus que també la pateixen. (Cacioppo, et al., 2009). Varis investigadors han proposat que les persones amb xarxes composades principalment per vincles familiars són més vulnerables a la soledat que les persones amb xarxes més heterogènies (Dykstra, 1990; Silverstein i Chen, 1996). Tot i que és àmpliament reconegut que l'existència d'una parella sentimental és un factor protector contra la soledat, les relacions matrimonials afectades per conflictes i sense suport emocional estan relacionades amb nivells més alts de soledat (Dykstra i Fokkema, 2007). Finalment, situacions adverses en l'àmbit familiar durant la infantesa han estat relacionades amb nivells més elevats de soledat durant el curs de la vida, fins i tot en la vellesa (Nicolaisen i Thorsen, 2014).

L'afirmació àmpliament compartida segons la qual la soledat és una conseqüència de l'aïllament social (Dahlberg et al., 2018; Routasalo et al., 2006), és qüestionada per recents aportacions en el context de la *teoria evolutiva de la soledat*, que consideren que l'aïllament social percebut provoca "comportaments categoritzats en termes d'aptitud evolutiva com a egoistes" (Cacioppo et al., 2018). En altres paraules, l'individu atribuiria inconscientment el sentiment de soledat a aspectes negatius del seu context social que requeririen del comportament egoista com a mecanisme d'autoprotecció. En aquest sentit, factors inherentment relacionats amb l'envelliment com la pèrdua de familiars i amics o de capacitat funcional, podrien provocar un "replegament en si mateix" -en un intent d'aproximar-nos amb altres paraules als "comportaments categoritzats en termes d'aptitud evolutiva com a egoistes"-. Així, les funcions adaptatives de la soledat que, hipotèticament, van facilitar la supervivència en el Pleistocè, podrien tenir conseqüències perjudicials en la modernitat i comportar l'aïllament social objectiu. D'aquesta manera, les persones grans podrien sentir-se soles abans d'estar-ho objectivament, i no a la inversa. La teoria evolutiva de la soledat ha estat complementada per estudis que prenen en consideració una semblança entre el dolor físic i el dolor "social" a nivell neurològic, la qual cosa explicaria aquest efecte en el comportament. Tot i que des d'aquesta mateixa perspectiva s'ha justificat la soledat com a predictora de l'aïllament social i exactament el contrari, això és, que el dolor social és una resposta a la desconnexió social i que incentiva la recerca del restabliment de les connexions relacionals (Cacioppo et al., 2006a). A nivell genètic s'ha detectat que la majoria de les semblances en la soledat entre bessons són atribuïbles a gens compartits (Boomsma et al., 2005), tot i que aquest component hereditari sembla reduir-se amb el pas del temps: l'heretabilitat passaria del 58% a l'edat de 7 anys, al 26% a l'edat de 12 anys, la qual cosa suggereix que aquestes bases genètiques de la soledat podrien ser modelables per l'entorn físic i social (Bartels et al., 2008).

Tot i que el concepte de solitud més freqüent en investigacions és el concepte unidimensional proposat en aquesta tesi doctoral, es poden distingir diversos tipus -o dimensions- de solitud. Entre questes concepcions multidimensionals de la soledat, la proposada per Robert Weiss (1973) en la *teoria de les provisions socials*, és la que ha comptat amb més suport entre la comunitat científica. La teoria de les provisions socials es fonamenta en l'existència d'una sèrie de recursos als quals l'individu tan sols pot accedir a través de les seves relacions socials i que són necessaris per al seu benestar

psicosocial. Aquesta teoria distingeix entre la soledat emocional -derivada de l'absència d'una figura íntima o d'un vincle emocional proper- i la solitud social -derivada de l'absència d'un grup més ampli de contactes. Segons Weiss (1973), les experiències subjectives de la soledat social i de l'emocional són qualitativament diferents, ja que la soledat social provocaria sentiments d'avorriment i depressió, mentre que la soledat emocional estaria vinculada a l'ansietat i a la sensació d'aïllament. En les darreres dècades, investigadors principalment europeus han optat per recuperar la dimensionalització de Weiss (De Jong Gierveld i van Tilburg, 2006; Dykstra i De Jong Gierveld, 2004). La concepció que s'utilitza de soledat és essencial a l'hora d'escollir l'instrument de mesura.

Els dos instruments de mesura més utilitzats són l'escala de soledat de la Universitat de California-Los Angeles (UCLA) (Russell, et al., 1996), vinculada a la conceptualització unidimensional de la soledat, i l'escala de solitud De Jong Gierveld (De Jong Gierveld i Kamphuis, 1985), que distingeix entre les dimensions social i emocional. Ambdues escales tenen en comú que fan servir preguntes indirectes, on no utilitzen el terme "soledat", per tal de superar el biaix provocat per les dificultats que tenen els individus a admetre la soledat com a conseqüència de l'estigma que existeix sobre aquesta condició (Lau i Gruen, 1992). La primera versió de l'escala de soledat de la UCLA (Russell, et al., 1978), presentava tots els ítems redactats en sentit negatiu, fet que va provocar una revisió posterior que incloïa ítems en ambdós sentits (Russell et al., 1980). En una segona revisió, els ítems i els formats de resposta es van simplificar per facilitar l'administració de la mesura en poblacions de baix nivell educatiu (Russell, 1996). Finalment, el 2004 es va construir una versió més curta composada per tres ítems per tal de facilitar el seu ús en qüestionaris epidemiològics (Hughes et al., 2004). La versió original de 1985 de l'escala de solitud de De Jong Gierveld (De Jong Gierveld i Kamphuis, 1985) consta d'11 ítems. Cinc ítems són expressats de manera positiva i sis són expressats negativament. Tot i que l'escala té com a objectiu mesurar la gravetat de la soledat, els ítems van ser escollits prenent en consideració la distinció de Weiss (1973), de manera que els investigadors tenen l'opció d'utilitzar les subescales emocional i social separadament. Com en el cas de l'escala de la UCLA, existeix una versió més curta (De Jong Gierveld i Van Tilburg, 2006) composada per sis ítems: tres referits a la soledat emocional i tres referits a la soledat social.

Tot i que l'escala de la UCLA i les dues subescales que composen l'escala de De Jong Gierveld estan conformades per tres ítems, aquests són diferents entre si (veure Taula 5), fet que ha estat utilitzat com un argument per a defensar l'ús de mesures directes de la soledat amb la pretensió de conservar les concepcions que les persones afectades tenen sobre aquesta i evitar que els investigadors utilitzin les mesures per a justificar les seves pròpies concepcions (Jylhä i Saarenheimo, 2010). Malgrat aquestes observacions, tant les dues escales com les dues subescales han estat provades en diversos estudis, revelant una forta correlació amb preguntes directes, així com una fiabilitat i una validesa adequades (Victor et al., 2005, De Jong Gierveld i Van Tilburg, 2010; Penning et al., 2014).

Soledat unidimensional (Hughes et al., 2004)	Soledat bidimensional (Gierveld i Tilburg, 2006)	
	Soledat emocional	Soledat social
1.-Amb quina freqüència sents que no tens companyia? 2.-Amb quina freqüència et sents abandonat? 3.-Amb quina freqüència et sents aïllat dels altres?	1.-Tinc un sentit general de buidor. 2.-No tinc ganes de tenir gent al meu voltant. 3.-Sovint em sento rebutjat.	1.-Hi ha moltes persones amb les quals puc confiar quan tinc problemes. 2.-Conec moltes persones amb qui puc confiar completament. 3.-Hi ha prou gent amb la qual em sento proper.
Respostes: (1 = gairebé mai; 2 = alguna vegada; 3 = sovint).	**Respostes:** 0 = Completament en desacord, en desacord, o ni acord ni en desacord; 1 = Completament d'acord o d'acord (A la inversa en el cas de la soledat social).	

Taula 5. Versions curtes de les escales de soledat més utilitzades (les puntuacions s'obtenen de la suma dels números associats a cada resposta).

1.5.1.-Epidemiologia de la soledat

Utilitzant dades de l'Enquesta Social Europea (ESS), Yang i Victor (2011) van obtenir la prevalença de soledat en 25 països europeus. La soledat va ser mesurada per mitjà d'una pregunta directa: "Usant aquesta escala, digui'm quant de temps es va sentir sol la setmana passada", Les possibles respostes eren 1 = "Mai o gairebé mai", 2 = "Alguna vegada", 3 = "La major part del temps", 4 = "Tot o gairebé tot el temps'" i 8 = " No ho sé". En comprar els resultats, les diferències en percentatges de solitud freqüent (corresponent a les respostes 3 i 4) van resultar ser significatives tant entre països com entre franges d'edat.

Els autors van separar els països en tres grups en funció de la prevalença de soledat: el grup 1 va estar conformat principalment per països de l'est d'Europa, el grup 2 per països del sud d'Europa, i el grup 3 per països del nord i centre d'Europa. Aquests darrers van mostrar els percentatges més baixos de soledat, que oscil·laven entre l'1 i el 6% per als menors de 30 anys, entre el 2 i el 7% per a aquells individus entre els 30 i els 59 anys, i entre el 3 i el 9% per a aquells que tenien 60 o més anys. Els països del sud d'Europa van mostrar percentatges lleugerament superiors, que oscil·laven entre el 4 i el 10% per als menors de 30 anys, entre el 5 i el 9% per als d'entre 30 i 59 anys, i entre el 10 i el 15% per als de 60 o més anys. Finalment, els països de l'est d'Europa van mostrar els percentatges més alts, que oscil·laven entre el 6 i el 15% per als menors de 30 anys, entre el 8 i el 20% per als que tenien entre 30 i 59 anys, i entre el 19 i el 34% per als majors de 59 anys (veure Taula 6).

	% de soledat freqüent				% de soledat freqüent		
	<30	30-59	>60		<30	30-59	>60
Grup 1:				Portugal	6,5	9,0	14,9
Bulgària	5,6	8,1	18,9	Eslovènia	4,6	5,0	15,2
Hongria	9,6	13,3	21,1	Espanya	4,4	6,5	11,5
Letònia	7,8	10,9	18,8	**Grup 3:**			
Polònia	5,5	11,0	20,1	Bèlgica	6,2	6,5	8,7
Romania	7,8	10,9	18,8	Dinamarca	3,4	1,9	3,2
Rússia	11,3	15,4	24,4	Finlàndia	2,6	3,7	6,1
Eslovàquia	8,8	10,5	19,6	Alemanya	5,1	4,4	7,0
Ucraïna	15,3	19,8	34,0	Irlanda	4,1	5,0	5,4
				Països Baixos	3,4	3,3	6,0
Grup 2:				Noruega	2,2	2,6	5,0
Àustria	9,5	6,4	10,5	Suècia	6,0	3,7	7,4
Xipre	3,7	5,8	10,2	Suïssa	1,3	2,6	4,8
Estònia	6,1	5,6	14,0	Regne Unit	6,3	5,5	7,4
França	8,2	8,8	11,4				

Taula 6. Prevalença de solitud freqüent per grups d'edat (Yang i Victor, 2011).

En referència a les diferències entre gèneres, els resultats d'una metaanàlisi (Pinquart i Sörensen, 2001) amb 102 estudis va mostrar que les dones reporten nivells significativament més alts de soledat que els homes. Aquesta diferència entre gèneres es dona de manera més pronunciada en estudis en què la solitud és mesurada amb indicadors directes d'un sol element que no pas en estudis que utilitzen instruments de mesura indirectes. Per tant, la diferència entre gèneres podria estar relacionada amb una major reticència dels homes a reconèixer la soledat en referir-s'hi de forma directa. Per altra banda, l'existència de models de socialització específics per a cada gènere també podria

contribuir a explicar les diferents prevalences de soledat entre homes i dones. Així, els homes, socialitzats per ser emocionalment independents, prefereixen relacions poc exigents i tendeixen a dependre emocionalment de les seves dones, mentre que les dones es socialitzen per tenir necessitats afectives més complexes i les seves necessitats emocionals no són satisfetes a través d'una relació exclusiva amb un home (Chodorow, 1978). Això podria explicar diferències de gènere en la relació entre estat civil i soledat. Alguns investigadors han mostrat que la pèrdua de la parella sentimental és un factor predictor de la soledat per als homes, mentre que les dones tendeixen a superar-ho amb més facilitat, si més no en el que es refereix a la plenitud de la seva vida social (Rokach et al., 2007).

1.5.2.-Condicionants socials de la soledat

Malgrat presentar una elevada capacitat predictiva de malalties físiques i mentals, així com de mortalitat precoç per totes les causes (Courtin i Knapp, 2017; Luo et al., 2012), la soledat no és -i no ha der ser- considerada una patologia sinó que la soledat és, en gran part, una conseqüència de determinats entorns relacionals que es donen en diferents contexts econòmics, polítics, socials i culturals i, per això mateix, ha de poder ser afrontada a través d'intervencions que, per una banda, millorin les condicions contextuals per tal d'afavorir la creació d'entorns relacionals menys proclius a la soledat i, per l'altra, facilitin l'adaptació psicosocial de l'individu en el seu entorn. Ben al contrari de ser concebuda com una patologia, s'ha proposat entendre la solitud com un vincle de primer nivell entre els plans epidemiològic i biològic d'anàlisi, sent considerada com un factor que aguditza els mecanismes que vinculen condicions socials i salut, pel seu efecte negatiu sobre els hàbits saludables i la reactivitat a l'estrès (Hawkley i Cacioppo, 2003). Per tant, la soledat podria ser considerada com un mecanisme causal que relaciona estatus socioeconòmic i salut -com ens hi hem referit anteriorment- i, al mateix temps, com un moderador de la relació i, fins i tot, com una variable independent que afecta l'estat de salut independentment de l'entorn socioeconòmic.

D'entre les múltiples conseqüències de la soledat sobre la salut pública (Leigh-Hunt et al., 2017) destaca la seva relació particularment estreta amb la depressió (Cacioppo et al., 2006b; Dahlberg et al., 2014; Houtjes et al., 2014). Tanmateix, si la soledat causa depressió o si és la depressió qui desencadena els sentiments de soledat, o si la relació es dona de forma recíproca, no ha estat clarament establert (Cacioppo et al.,

2010; Dahlberg et al., 2014). També s'han obtingut conclusions discordants sobre la relació entre soledat, xarxes socials i depressió. La soledat ha estat presentada com un mediador significatiu en l'associació entre factors relacionats amb les xarxes socials i la depressió (Santini et al., 2016), mentre que altres investigadors han arribat a la conclusió que l'associació temporal entre la soledat i la depressió no és atribuïble a la mida o a la qualitat de les xarxes socials (Cacioppo et al., 2010), i que els efectes de les xarxes socials i de la soledat sobre la depressió són independents (Houtjes et al., 2014). Per altra banda, soledat i depressió semblen compartir la majoria de correlats en tots els dominis presos en consideració, la qual cosa augmenta els factors de confusió de la relació entre ambdues condicions i dificulta la seva comprensió.

En el domini demogràfic, la soledat ha estat relacionada amb factors com el gènere, l'edat o l'ètnia (Dahlberg i McKee, 2014) o amb la mancança d'una parella sentimental -ja sigui per divorci, separació o viudetat (Pinquart, 2003)-. A nivell microeconòmic, la solitud ha estat relacionada amb l'accessibilitat als recursos materials (Hansen i Slagsvold, 2015). Com en el cas de la depressió, a nivell macroeconòmic, la soledat ha estat associada a les polítiques redistributives (De Jong Gervield i Dikstra, 2012), mentre que, a nivell de barri, els sentiments de solitud han estat relativament poc estudiats en relació amb l'ambient construït. Un dels pocs estudis sobre aquesta associació va revelar que les persones que viuen en barris densament urbanitzats i amb una percepció negativa de les característiques qualitatives del barri, tenen una major prevalença de soledat (Scharf i De Jong Gierveld, 2008). Per altra banda, l'entorn residencial, incloent les característiques de l'habitatge i altres aspectes físics del barri, així com l'accessibilitat a serveis i la vida social del barri, podrien actuar com a protectors contra la soledat, especialment en zones socioeconòmicament desfavorides (Kearns et al., 2015). En el domini social i cultural, la relació entre un baix nivell educatiu i una elevada probabilitat de patir soledat compta amb un ampli consens entre la comunitat científica (Cacioppo et al., 2010; Cohen-Mansfield et al., 2016). En canvi, en matèria de capital social existeix una relativament baixa quantitat d'estudis sobre la seva relació amb la soledat. Si bé un estudi va trobar relacions significatives entre soledat i capital social estructural o cognitiu (Nyqvist et al., 2016), no existeixen investigacions sobre la interacció entre ambdós tipus de capital social, ben al contrari del que succeeix en l'estudi de les desigualtats en salut (Uphoff, et al., 2013). Finalment, en el que fa referència al domini ambiental, s'ha detectat un dràstic augment en la prevalença de soledat entre

supervivents de desastres naturals (Lee et al., 2019) o entre els refugiats en conflictes bèl·lics (Strong et al., 2015).

En general, la soledat no pot ser concebuda com un problema individual. Les característiques del context social poden ser factors que propicien una elevada prevalença de soledat. Per tant, cal abordar l'estudi de la soledat a partir de models teòrics que combinin factors individuals (qualitat de vida, habilitats cognitives, nivell educatiu, ocupació) i estructurals (polítiques de benestar disponibles, composició demogràfica, valors culturals) i tan sols des d'aquests models teòrics serà possible avaluar la problemàtica en totes les seves dimensions.

1.5.3.-La soledat en persones grans

Tot i que sovint es considera la soledat com un problema específic de les persones grans, la solitud es pot experimentar en tots els grups d'edat, incloent la infantesa i l'adolescència. Un estudi amb una àmplia mostra d'adolescents va detectar que el 36,1% dels participants va experimentar un augment en el sentiments de soledat en comparació amb la infantesa. Les seves experiències estaven estretament relacionades amb el desenvolupament d'expectatives sobre el seu entorn relacional (Schinka et al., 2013). Els adolescents que pateixen soledat crònica tenen més probabilitats de patir depressió, planificació o intents suïcides i dèficit d'habilitats socials (Schinka et al., 2012). Tanmateix, la soledat crònica és especialment freqüent entre les persones grans. L'exposició a factors de risc és més pronunciada a mesura que els individus envelleixen. La connexió o la desconnexió social es dona de forma progressiva durant el transcurs de les diferents etapes vitals i les seves conseqüències es fan més evidents en arribar a edats avançades. A més, existeixen una sèrie de transicions vitals pròpies de les persones grans que poden provocar alteracions significatives en la connexió social com ara la jubilació, la viduïtat o els problemes de salut relacionats amb l'envelliment. Malgrat aquesta major exposició a factors de risc que presenten les persones grans, cadascuna d'aquestes circumstàncies semblen disminuir els seus nivells de benestar d'una manera inferior que en altres franges d'edat, la qual cosa ha estat anomenada com "paradoxa de l'envelliment". La *teoria de la selectivitat socioemocional* de Carstensens (2006), explica aquesta paradoxa argumentant que les persones grans donen més valor a les relacions socials gratificants i no senten interès per ampliar el seu cercle de coneguts i que aquest

aprofundiment emocional en determinades relacions pot ser un amortidor de l'efecte de determinades condicions o circumstàncies socials sobre la depressió i la soledat.

Envelliment de la població, pobresa i soledat semblen ser variables relacionades. Existeixen dues hipòtesis al respecte: la primera es refereix a que la disponibilitat d'un sistema social per a proporcionar polítiques de benestar per a aquells que ho necessiten és una condició clau per a l'assoliment d'una certa qualitat de vida i per a l'alleujament de la soledat entre persones grans (De Jong Gervield i Dikstra, 2012). La segona hipòtesi suggereix que les xarxes socials es redueixen amb l'edat i que, per tant, la prevalença de soledat augmentarà necessàriament a mesura que la població envelleixi (Holt-Lunstad, 2017). Si combinem les dues hipòtesis podríem afirmar que, tot i que les polítiques socials tinguin la capacitat de reduir la prevalença de soledat, aquesta augmentarà necessàriament amb l'envelliment de la població. Per tal de comprovar aquesta proposta, vam prendre en consideració els percentatges de població de més de 60 anys, les prevalences de soledat (Yang i Victor, 2011) i els percentatges de població en risc de pobresa després de transferències socials (Eurostat, 2008) en diferents països europeus, tal i com mostrem a la Taula 7:

	Risc pobresa	Població >60	Soledat >60		Risc pobresa	Població >60	Soledat >60
Grup 1:				Eslovènia	12,3	27,4	15,2
Bulgària	21,4	29,4	18,9	Espanya	19,8	26,7	11,5
Hongria	12,4	29,6	21,1	**Grup 3:**			
Letònia	25,9	23,7	18,8	Bèlgica	14,7	25,5	8,7
Polònia	16,9	28,9	20,1	Dinamarca	11,8	32,1	3,2
Romania	23,6	22,8	18,8	Finlàndia	13,6	32,1	6,1
Eslovàquia	10,9	21,9	19,6	Alemanya	15,2	29,5	7,0
Grup 2:				Irlanda	15,5	25,1	5,4
Àustria	15,2	16,4	10,5	P. Baixos	10,5	25,4	6,0
Xipre	15,9	20,8	10,2	Noruega	11,4	23,8	5,0
Estònia	19,5	30,2	14,0	Suècia	13,5	27,9	7,4
França	12,5	22,8	11,4	Suïssa	15,7	27,5	4,8
Portugal	18,5	31,2	14,9	Regne Unit	18,7	28,6	7,4

Taula 7. Percentatges de risc de pobresa després de transferències socials (Eurostat, 2008), de persones de 60 anys o més i de solitud freqüent (Yang i Victor, 2011) a països de la UE

Seguidament, vam dur a terme dos models de regressió bivariades per provar si els percentatges de persones grans i els de persones en risc de pobresa estaven significativament associats a la prevalença de solitud. Vam obtenir resultats significatius

tan sols en el cas del percentatge de persones en risc de pobresa. Per avaluar si existia una col·linealitat entre ambdues variables, vam dur a terme un model de regressió multivariant amb les dues variables independents ajustades entre si (veure Taula 8).

	Percentatge de soledat B (IC 95%)	*p*-valor
Percentatge en risc de pobresa	0,60 (0,01-1,19)	<0,05
Percentatge de persones de 60 o més anys	-0,13 (-0,75-0,49)	0,674

Taula 8. Factors relacionats amb la prevalença de soledat entre persones de 60 o més anys als països de la UE (B=coeficient Beta; IC=Interval de Confiança)

Al contrari que la relació entre percentatge de persones grans i prevalença soledat, la relació entre percentatge en risc de pobresa i prevalença de soledat va resultar ser significativa, inclús després d'ajustar el model. Per tal d'aproximar-nos a la magnitud de la relació, hem projectat la recta de la regressió (veure Figura 5), segons la qual en passar d'un risc de pobresa del 10 al 25%, la proporció de persones amb soledat freqüent passa del 8 al 18%. Per tant, sembla raonable afirmar que les diferències en termes de solitud observades entre països s'expliquin per escenaris econòmics diferents, més que pel percentatge de persones grans.
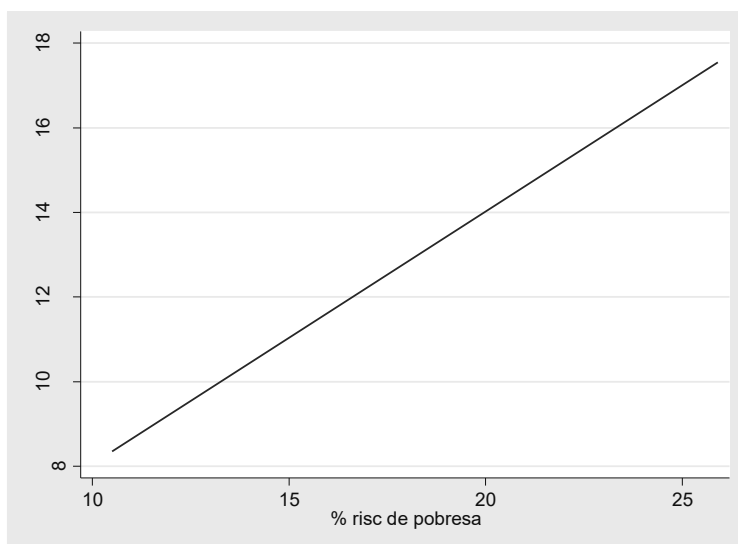
Figura 5. Associació entre el percentatge de persones en risc de pobresa i el percentatge de persones de 60 o més anys amb soledat freqüent en països de la UE

Malgrat les clares limitacions d'aquest breu estudi -com la falta de variables de control o un limitat numero de casos-, els resultats de l'anàlisi suggereixen que una

població envellida no té perquè ser una societat composada per persones que se senten soles. La soledat depèn, en gran mesura, de factors estructurals que poden ser modificables. Entre ells, a banda dels que ja hem comentat en aquesta introducció, s'hi troba l'edatisme, això és, la discriminació contra la gent gran, que té uns profunds orígens psicològics i sociològics, els quals configuren la forma en què la gent creix en una societat que sublima la condició de ser jove i que és refractària a acceptar la realitat de fer-se gran. Això contribueix a facilitar l'exclusió social i la soledat de les persones grans (Shiovitz-Ezra et al., 2018). La solució a aquest problema passa necessàriament per comprendre quins són els condicionats socials del benestar en la tercera edat -d'acord amb l'objectiu del present treball d'investigació-, atendre adequadament les necessitats socials de les persones grans i socialitzar una visió més realista del cicle de la vida a través dels sistemes educatius i legals, per tal d'aconseguir que la tercera edat torni a esdevenir un moment del curs de la vida profundament significatiu tant a nivell individual com col·lectiu.

Capítol 2

OBJECTIUS I HIPÒTESIS

2.1: Objectius

La perspectiva de la nostra recerca és la de la gerontologia crítica, aplicada a través de la metodologia pròpia dels models d'envelliment reeixit, els quals estan estretament vinculats a l'epidemiologia social. Es tracta, per tant, d'una metodologia estrictament quantitativa que té en compte diferents nivells d'anàlisi. La major part de la revisió bibliogràfica que hem presentat en la introducció és coherent amb aquesta perspectiva teòrica i amb el marc conceptual que hem presentat. El nostre primer objectiu -previ a la selecció dels objectius de la recerca- ha estat el de detectar potencials aportacions en base a les preguntes que queden obertes en la revisió presentada.

Segons la literatura revisada, les diferents teories que proposen una explicació causal -en forma de mediació- sobre l'efecte de les condicions socials en la probabilitat de patir depressió major, són les teories que hem anomenat -o que han estat anomenades- materialista, biomèdica, psicosocial, del comportament, de l'aptitud cognitiva i de la comparació social. En aquest cas, la soledat seria un factor mediador propi de la teoria psicosocial. Tanmateix, la soledat també ha estat definida com una variable que afecta l'estat de salut independentment de l'entorn socioeconòmic, malgrat poder agregar l'efecte dels condicionants socials sobre la salut. En base a aquestes consideracions, hem plantejat el *primer objectiu* per tal de posar a prova diferents teories (psicosocial, material, del comportament, biomèdica i de la comparació social) i determinar el rol de la soledat:

1. Avaluar les variables mediadores en la relació entre estatus socioeconòmic i la probabilitat de patir episodis de depressió major entre persones de mitjana (50-65 anys) i avançada edat (més de 65 anys).

Una altra pregunta que queda oberta és la que es refereix al sentit de les relacions entre soledat i depressió, per una banda, i aïllament social i soledat, per l'altra. Malgrat que l'estreta relació entre soledat i depressió és àmpliament reconeguda, al llarg de la literatura revisada, no s'estableix clarament si és la depressió la que causa la soledat, si és a la inversa, o si la relació es dona en ambdós sentits. En la mateixa línia, tot i que una majoria d'investigadors considera que l'aïllament social és un predictor de la soledat, segons recents propostes de partidaris de la teoria evolutiva de la soledat, la soledat provoca l'aïllament social com a conseqüència de "comportaments categoritzats en termes d'aptitud evolutiva com a egoistes". Per tant, el *segon objectiu* és:

2. Analitzar les associacions longitudinals existents entre sentiments de solitud, aïllament social objectiu i depressió.

Tot i que el concepte de soledat més freqüent en les investigacions en epidemiologia social és el concepte unidimensional proposat en aquesta tesi doctoral, existeixen concepcions multidimensionals de la soledat. Entre aquestes, la que compta amb més acceptació és la que proposa una distinció entre la soledat social -vinculada a la integració en un grup o col·lectiu-, i l'emocional -vinculada a una relació sentimental-. Segons Weiss (1973), les experiències subjectives de la soledat social i emocional són qualitativament diferents, ja que la social provocaria sentiments d'avorriment i depressió, mentre que l'emocional estaria vinculada a l'ansietat i la sensació d'aïllament. En base a aquestes aportacions ens plantegem si la concepció unidimensional de la soledat és incompatible amb la distinció que fa Weiss. Per tal de respondre'ns aquesta pregunta provarem diferents components de les xarxes socials com a moderadors en la relació entre soledat (utilitzant la mesura unidimensional) i depressió major. El *tercer objectiu* és:

3. Estudiar el paper dels diferents components de les xarxes socials (quantitat i qualitat de les interaccions, presència o absència de parella sentimental,...) en la relació entre soledat i depressió.

Existeixen dos parells de factors que podrien interactuar per tenir un efecte en la probabilitat de patir soledat. Per una banda, en referir-nos al domini social i cultural, hem destacat que si bé un estudi va trobar relacions significatives entre soledat i capital social estructural i cognitiu, no existeixen investigacions sobre la interacció entre ambdós tipus de capital social com si que succeeix en el cas de l'estudi de les desigualtats en salut. Per altra banda, segons la hipòtesi de supervivència a la qual ens hem referit, les persones grans tendeixen a veure's menys afectades pels factors psicosocials amb una elevada estabilitat durant el curs de la vida com ara els indicadors d'estatus socioeconòmic. En base a aquestes dues observacions, el *quart objectiu* és:

4. Investigar l'impacte de la interacció entre estatus socioeconòmic i edat, així com entre capital social individual i capital social col·lectiu, en la probabilitat de sentir solitud.

2.2: Hipòtesis

A partir de cadascun dels objectius hem plantejat diferents hipòtesis en base a les explicacions que ens han semblat més plausibles. Aquestes sis hipòtesis presentades en ordre alfabètic són les que posarem a prova en el següent capítol.

1. Avaluar les variables mediadores en la relació entre estatus socioeconòmic i la probabilitat de patir episodis de depressió major.

   a. Cada indicador d'estatus socioeconòmic es relaciona amb la depressió a través de diferents mediadors: factors materials per als ingressos a la llar, factors de comportament per a l'educació i factors psicosocials per a l'ocupació.

   b. La soledat és el factor mediador més fortament associat a la depressió de forma independent, encara que amb una capacitat de mediació limitada.

2. Analitzar les associacions longitudinals existents entre sentiments de solitud, aïllament social objectiu i depressió.

   c. l'aïllament social provoca la solitud i la solitud provoca la depressió.

3. Estudiar el paper dels diferents components de les xarxes socials en la relació entre soledat i depressió.

   d. La soledat mesurada com a constructe unidimensional esta més fortament associada a la depressió quan es vincula a una reduïda xarxa social i no a la mancança d'una parella sentimental.

4. Investigar l'impacte de la interacció entre estatus socioeconòmic i edat, així com entre capital social individual i capital social col·lectiu en la probabilitat de sentir solitud.

   e. L'associació entre estatus socioeconòmic i soledat és més robusta en les persones grans més joves (de 50 a 60 anys).

   f. L'associació entre capital social cognitiu i soledat és més robusta en persones que viuen en àrees amb elevat capital social estructural.

Capítol 3

MÈTODES I RESULTATS

3.1.- The association between socioeconomic status and depression among older adults in Finland, Poland and Spain: A comparative cross-sectional study of distinct measures and pathways.

Paper 1

The association between socioeconomic status and depression among older adults in Finland, Poland and Spain: A comparative cross-sectional study of distinct measures and pathways.

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Research paper

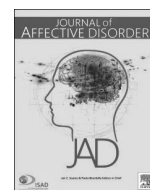# The association between socioeconomic status and depression among older adults in Finland, Poland and Spain: A comparative cross-sectional study of distinct measures and pathways

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ARTICLE INFO

ABSTRACT

Background: Socioeconomic status, as measured by education, occupation or income, is associated with depression. However, data are lacking on the psychosocial, material and behavioral mediators of these associations. We have examined the association of education, occupation and income with depression and the potential mediations using community-based data.
Methods: A total of 7,966 older adults were interviewed in Finland, Poland and Spain. The differential associations between depression and SES, mediator variables, country of residence and cofounder variables, such as chronic physical conditions, were assessed through logistic regression models. Meditation analyses were carried out using *khb* method for Stata 13.1.
Results: Education, followed by household income, were the SES indicators most frequently significantly associated with depression. These SES markers, but not occupation, showed an independent effect in this association. Psychosocial factors and loneliness in particular showed the strongest associations with depression among mediator variables. However, material factors and, especially, financial strain had a higher mediating function in the association between SES and depression. Overall, SES markers, chronic conditions and mediation factors were more positive in Finland than in Poland and Spain.
Conclusion: Improving psychosocial and material dimensions as well as access to the educational system for older adults might result in a reduction in the prevalence of depression in the general population and particularly among individuals with low SES.

1. Introduction

Depression is one of the most prevalent mental disorder among older adults and it is associated with low quality of life (Blazer, 2003), high likelihood of suicide (Ferrari et al., 2013) and poor physical health (Prince et al., 2007). A systematic review showed the prevalence of major depression ranges from 1% to 16% among the elderly, and clinically significant depressive symptoms in similar settings vary between 7.2% and 49%. The main factors associated with depressive disorders in the elderly are female gender, somatic illness, cognitive impairment, functional disability, lack or loss of close social contacts and clinical history of depression (Djernes, 2006).

In 2003, a meta-analysis showed that socioeconomic status (SES) was significantly associated with depression, indicating that low SES

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slightly increased the risk of episodes and moderately increased the risk of persistence of depression (Lorant et al., 2003). This meta-analysis noted that education was used as a proxy for SES in most studies selected. Although this practice is common in social epidemiology (Dalstra et al., 2005; von dem Knesebeck et al., 2006; Pruchno et al., 2016), other researchers have showed that, in analyses using the three traditional SES indicators, namely educational level, occupation and household income (Krieger et al., 1997), mutually adjusted, each indicator shows independent effects in different chronic conditions (Geyer et al., 2006). We hypothesize that these differences may be due to each SES indicator being associated with different mediating factors.

At an individual level, SES influences multiple determinants of health: behavioral scientists highlight an increased risk of unhealthy life styles such as a sedentary way of life or tobacco consumption in low SES individuals (Brunello et al., 2015); materialist theories cite unequal access to health care and differing exposure to material deprivation (Helfin and Iceland, 2009; Zimmerman and Katon, 2005); and psychosocial theories relate low SES to a smaller social network and greater likelihood of feeling lonely (Domènech-Abella et al., 2017a, 2017b).

A recent systematic review on the role of biomedical, psychosocial and behavioral factors in the association between SES and self-rated health revealed that material factors contributed most to differences in self-rated health, independently of age, gender and SES indicator (Moor et al., 2016). However, psychosocial factors were identified as the strongest mediator in the association between educational level and depression (Koster et al., 2006). In this last study, physical health status was added as a new pathway between SES and depression. In our view, although low SES is a risk factor for many chronic physical conditions associated with increased depressive symptoms (Bisschop et al., 2004; Koster et al., 2006), the association between SES and physical health status is explained through similar mediators (Stolz et al., 2018), as in the case of the association between SES and depression and it could, therefore, be a confounder in that association rather than a mediator.

A recent systematic review and meta-analysis (Patel et al., 2018) showed that income inequality is associated with the prevalence of depression in the population. The Gini coefficient is the most commonly used measure of income inequality and previous studies suggest 0.3 as a potential threshold above which the impact of income inequality on health may become significantly higher (Kondo et al., 2012). According to Organization for Economic Co-operation and Development data (2018), the countries analyzed by the present study (Finland, Poland and Spain), have Gini coefficients of 0.26, 0.29 and 0.34, respectively.

The aim of the present study is to compare the effect of the main socioeconomic status (SES) indicators (education, household income and occupation) and pathways (material, behavioral and psychosocial factors) on depression in a representative sample of older adults from three European countries (Finland, Poland and Spain) with distinct socio-economic characteristics. The goals are: (1) to investigate whether each SES indicator may have an independent effect on depression, (2) to ascertain whether each SES indicator can be associated with specific pathways and (3) to assess the role of income inequality at the country-level in the association between SES and depression.

2. Methods

2.1 Study design

This study was part of COURAGE in Europe (Leonardi et al., 2014), an observational, cross-sectional, EU-funded, three-year survey of the general noninstitutionalized adult population (18 years or older) performed through household interviews in three European countries

(Finland, Poland, and Spain) which were selected to ensure broad representation across different European regions; the north, the east and the south of Europe, taking into consideration various demographic, cultural, socio-economic and health characteristics.

A stratified, multistage cluster sample design was used to obtain nationally representative samples. A probability proportional to size design was used to select clusters. Within each cluster, an enumeration of existing households was done to obtain an accurate measurement of size. Interviews were conducted face-to-face through Computer-Assisted Personal Interviewing (CAPI) at respondents' homes. All the interviewers participated in a training course on administration of the survey. Quality control procedures were implemented during fieldwork (Üstun et al., 2005). When individuals had severe cognitive impairment, judged at the interviewer's discretion, a shorter version of the questionnaire was administered to a proxy. The instruments were translated from English into Finnish, Polish and Spanish following translation guidelines for assessment instruments issued by the World Health Organization (2013), which included a forward translation, a targeted back-translation, review by a bilingual expert group, and a detailed translation report. The surveys were conducted between 2011 and 2012. The sample was composed of 10,800 individuals: 1,976 from Finland, 4,071 from Poland, and 4,753 from Spain. The individual response rate was 69.9% in Spain, 66.5% in Poland, and 53.4% in Finland. Only those individuals aged 50 years old and over who did not need a proxy respondent were included in this study ($n = 7,987$). Participants not responding to questions on health issues ($n = 21$) were also excluded. Therefore, the final sample was 7966: 1433 from Finland, 2910 from Poland, and 3623 from Spain.

2.2 Ethics statement

Ethical approval from the relevant ethics committees (Parc Sanitari Sant Joan de Déu, Barcelona, Spain; Hospital la Princesa, Madrid, Spain; National Institute for Health and Welfare, Helsinki, Finland, and Jagiellonian University Medical College, Krakow, Poland) was obtained and each participant provided written informed consent.

2.3 Measures

Participants were asked to provide socio-demographic and socio-economic information (age, gender, educational level, occupation, household income). Categories for highest level of education completed were low (primary school or less), medium (secondary or high school) and high (university degree). Participants were asked about the highest professional position attained during his/her life. Occupation was defined using ISCO 08 categories (European Union, 2009) which were categorized into three levels according to their skill requirements: "high" corresponds to managers, senior officials and legislators, professionals, technicians and associate professionals; "medium" corresponds to clerks, service and sales workers, skilled agricultural and fishery workers, craft and related trades workers, plant and machine operators, and assemblers; and "low" corresponds to elementary occupations such as office cleaners, freight handlers, garden laborers and kitchen assistants. Respondents were asked about household income through written statements and marking their best estimates of total household income on scales provided, including income from wages or stipends from a job as well as income from unemployment benefit, pensions, investments, and aid to families or other government or non-government benefits during the previous 12 months. The amount obtained was divided by household size, determined after applying the following weights: 1.0 to the first adult, 0.5 to each other household member aged 14 or over and 0.3 to each household member aged under 14 years old (Eurostat, 2016). Finally, since the association between

household income and depression may not be strictly linear (Domènech-Abella et al., 2017a), the variable was divided into quartiles according to the household income of the sample by country.

2.4 Pathways

In accordance with previous studies, we selected different pathways through behavioral, material and psychosocial factors (Koster et al., 2006; Moor et al., 2016; Stolz et al., 2018).

Material factors included labor situation (working, retired, unemployed or home-maker), having private insurance and financial strain. To assess financial strain, participants were also asked "Does your household have any problem paying bills (electricity, water, gas, telephone, etc.)?".

Psychosocial factors included social isolation, loneliness and marital status (married, single or previously married). Loneliness was assessed by means of the three-item UCLA Loneliness Scale which has a satisfactory degree of reliability and has both concurrent and discriminant validity (Hughes et al., 2004) and consists of the following items: "How often do you feel that you lack companionship?"; "How often do you feel left out?"; and "How often do you feel isolated from others?". Each item was answered on a three-point scale (1 = hardly ever; 2 = some of the time; 3 = often). The scores for each item were added to produce a loneliness scale from 3 to 9, with higher scores indicating a greater degree of loneliness. In line with a previous study (Domènech-Abella et al., 2017b), a cut-off of ≥ 6 for feeling loneliness was established. A social isolation index was also created based on the Berkam-Syme Social Network Index (SNI), which is a validated self-report questionnaire (Berkman and Syme, 1979). Respondents were given a point if they had less than monthly contact with children, other immediate family and friends (each scored as 1) and if they did not participate in any organizations, religious groups or committees more than twice per year (scored as 1). Being unmarried was not considered, as this was directly related to one of the covariates (marital status). The social isolation index was categorized as: Low (2–4), Medium (1) or High (0).

Behavioral factors included Body Mass Index (BMI), tobacco consumption and sedentary lifestyle. BMI was calculated as weight in kilograms divided by height in meters squared and obesity was defined as $BMI \geq 30 \ kg/m^2$. Tobacco consumption was assessed by asking whether participants were daily smokers, nondaily smokers, former smokers, or had never smoked. Sedentary lifestyle was measured using the Global Physical Activity Questionnaire (Armstrong and Bull, 2006), which collects information on physical activity in three settings as well as sedentary behavior, consisting of 16 questions about activity at work, travel to and from places and recreational activities.

2.5 Chronic medical conditions

Chronic medical conditions were based on self-report diagnoses of chronic obstructive lung disease, asthma, hypertension, arthritis, stroke, angina pectoris and diabetes in the previous 12 months. Additionally, symptom algorithms were used to detect undiagnosed cases of arthritis, stroke, angina, chronic lung disease, and asthma (Garin et al., 2016). The presence of hypertension was based on self-report diagnosis or presence of systolic blood pressure $\geq 140 \ mmHg$ or diastolic blood pressure $\geq 90 \ mmHg$ measured at the time of the interview (Basu and Millett, 2013; Mancia et al., 2013). Participants were considered to have a chronic medical condition if there was presence of either a diagnosed or undiagnosed condition. An adapted version of the Composite International Diagnostic Interview (CIDI 3.0) was used to assess the presence of depression in the previous 12 months (Haro et al., 2006) along with an algorithm based on the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 1994).

2.6 Statistical analysis

All data were weighted to account for the sampling design in each country and to generalize the study sample to the reference population. Post-stratification corrections were made to the weights to adjust for the population distribution obtained from the national census from each country, and for non-response so that results were representative of the Finnish, Polish and Spanish populations (Moussavi et al., 2007).

Twenty-six percent of individuals had at least one missing socioeconomic variable. We cannot be certain about the reasons for the missing data, but no major discrepancy was found between imputed data and complete-case analysis so we are leaning towards imputed data as missing at random. Missing values were imputed using multiple imputation by chained equations using the predictive mean matching method. The imputation model included important sociodemographic and health-related variables associated with drop-outs. Thirty imputed databases were created (Rubin, 2004).

Descriptive analyses were conducted to characterize the study sample in the three countries. These analyses included weighted proportions and unweighted frequencies. Chi-square tests were used to assess differences across countries in socio-demographic characteristics, SES markers, depression, physical chronic conditions and behavioral, material and psychosocial factors.

Logistic regression models were fitted to test the relationship between SES markers, living in Finland, Poland or Spain, chronic conditions and behavioral, material and psychosocial factors and depression after distinct adjustments. Odds ratio (95% confidence interval) and significance when $p < 0.05$ were reported in each model. To test whether the association between socioeconomic markers has a significantly different intensity depending on country, interactions between occupation, education and household income and country of residence were tested, obtaining no significant results (data not shown).

To assess the role of the distinct mediator-factor groups (see Fig. 1) in the association between household income, educational level, and occupation skill and depression, mediational analysis were performed using the khb command (Breen et al., 2013; Karlson et al., 2012; Karlson and Holm, 2011) through Stata version 13.1 (StataCorp, 2013). It decomposes the total effect of a variable into direct and indirect (i.e., mediational) effects. For categorical variables, the effects for each category compared with the category of reference are reported. Differences between the highest level (as category of reference) and the lowest level of each SES marker are reported in the present study. This method also allows for the calculation of the mediated percentage, which is interpreted as the percentage of the main association that can be explained by the mediator. The mediated percentage was only considered significant when the total and indirect effects were significant (Santini et al., 2016). The mediational analyses were also controlled for age, sex, country of residence and chronic physical conditions. Results were expressed as coefficients with 95% confidence interval. A *p*-value less than 0.05 was considered to be statistically significant.

3. Results

Study sample characteristics are presented in Table 1. Statistically significant differences by country were detected. Spain had older individuals than Finland and Poland, with a lower level of education and occupation and a higher proportion of unemployed individuals. There were also more people suffering from depression, diabetes and chronic lung disease and also from loneliness. However, Spain had a lower proportion of participants with a high level of social isolation. Poland had a higher number of married or cohabiting people, and a higher proportion suffering from angina and hypertension. Finland had a lower proportion of participants with financial strain, obesity and sedentary lifestyles; and a higher proportion with private insurance, and asthma. Finland also had more participants smoking in the past, but with fewer individuals currently smoking.

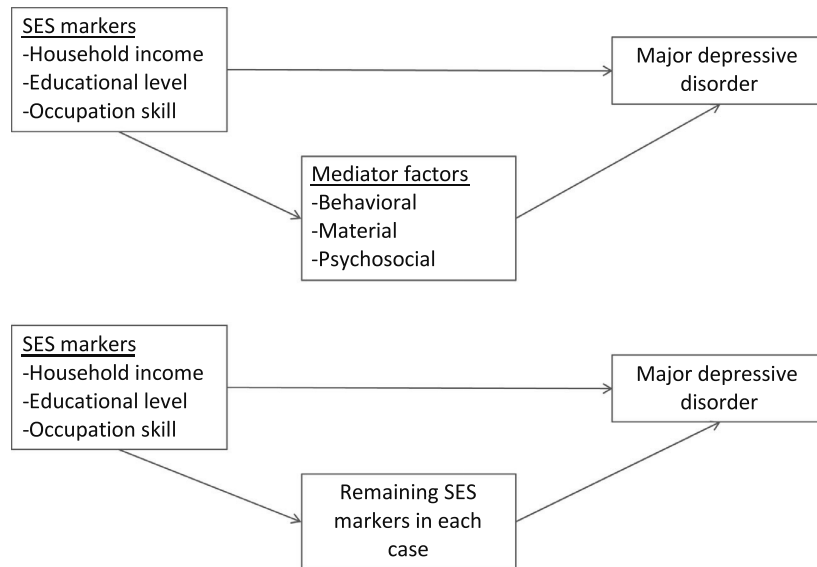The multivariable analysis (Table 2) reported factors related to

Fig. 1. Hypothesized mediation models predicting major depressive disorder.

depression after distinct adjustments. In Model 1 each variable was adjusted for age and sex. Having a lower level of education, occupation skill and household income; smoking currently, having obesity and a sedentary life, with financial strains and without private insurance, not working, with loneliness and social isolation, being separated, divorced or widowed or never married, with chronic physical conditions and living in Spain, were associated with a higher probability of depression. All these associations remained significantly associated with depression in Model 2 (variables adjusted for age, sex, and remaining covariates) having no formal education, smoking, with obesity and a sedentary lifestyle, being retired or disabled, with financial strain, loneliness and social isolation, being previously married, living in Spain and suffering from chronic conditions (except diabetes and stroke) remained significantly associated with depression.

The results from the mediation analyses on depression are shown in Table 3. All mediated percentages were considered significant apart from behavioral and psychosocial factors for household income; psychosocial factors for educational level; and behavioral factors for occupation skill. The percentages for behavioral, material and psychosocial factors and remaining SES markers as mediators in the association between the lowest household income level (compared with the highest level) and depression were 6.8%, 40.7%, 13.1% and 29.8%, respectively. In the case of educational level the percentages were 8.1%, 15.7%, 10.4%, and 20.0%) and for occupation skill, 9.6%, 24.0%, 27.1%, 52.0% 70.0%. Moreover, the mediated percentage of behavioral, material and psychosocial factors together was 46.6% for household income, 28.6% for education level, and 52% for occupation skill. In this last case, no significant direct effects were found when analyzing the mediation of all factors together and the mediation of remaining SES markers.

4. Discussion

The present study analyzed the association between traditional SES markers and major depressive disorder with material, psychosocial and behavioral factors as mediators in three samples of older adults from Finland, Spain and Poland. Education was the SES indicator most frequently significantly associated with depression, whereas psychosocial factors and loneliness in particular showed the strongest associations with depression. However, material factors and, especially, financial strain showed a significantly higher mediating function in the association between SES and depression.

Whereas the association between household income and depression was significantly mediated by material factors, the association with educational level was also found to be significantly mediated by behavioral factors, and the association with occupation skill was mediated by psychosocial factors to an even greater extent than material factors. However, the association between occupation skill and depression is mainly mediated by remaining SES markers and no significant direct effects were found.

Although at a chronological level the logical order would be that a poor education leads to a low-skilled occupation and, consequently, to a low income that could help to explain a poorer health status (Lahelma et al., 2004), the present mediation analysis shows that household income and educational level in particular but not occupation skill have a direct effect on depression, which suggested the need to take into account other potential mediators for each SES marker. Although several studies used education as a proxy for SES (Dalstra et al., 2005; Lorant et al., 2003; Pruchno et al., 2016) arguing that education is a fundamental determinant of household income (Ross and Wu, 1995) as well as of material and non-material resources and likelihood of unemployment (von dem Knesebeck et al., 2006), according to our results the relationship between each SES marker and depression was explained through different mediators and in different percentages. Therefore, each SES marker should have an independent effect.

Material factors were the main mediators between household income and depression and, with a lower effect, between educational level and depression. Among material factors, financial strain was the factor most strongly associated with depression. It could also have a direct impact on depression as financial strain is conceptually distinct from household income, because it also depends on the individual's ability to live within his/her means (Aneshensel, 2009). In this regard, a cross-sectional study with a representative sample of US older adults emphasized that controlling personal finances could be a protective factor against depression after adjusting for household income (Zurlo et al., 2014). In contrast, depression inequalities between the employed and unemployed (Catalano et al., 2011) as well as between those with and without private insurance (Burstin et al., 1992) have not been found to be significantly associated with depression after adjusting the association for SES and their impact on depression could be strictly as mediators.

The association between educational level and depression has also been found by several researchers to be significantly mediated for behavioral factors, arguing that limited education may mean less exposure

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Table 1
Characteristics of the study sample.

Characteristic	Overall n = 7966	Finland 1433 (21.7)	Poland 2910 (37.8)	Spain 3623 (40.5)	p-value
Age groups					
50–64	4095 (53.2)	738 (55.0)	1597 (58.9)	1760 (47.0)	0.000
65–79	2806 (36.5)	480 (34.0)	841 (32.3)	1485 (41.8)	
80+	1065 (10.3)	215 (11.0)	472 (8.8)	378 (11.2)	
Female*	4565 (54.8)	64.9 (28.5)	64.2 (23.7)	66.4 (24.1)	0.438
Household income					
Quartile 4	1721 (26.6)	335 (27.9)	726 (27.1)	660 (25.0)	Not applicable
Quartile 3	1706 (26.1)	271 (22.5)	734 (27.7)	701 (26.2)	
Quartile 2	1665 (24.1)	302 (25.1)	766 (24.4)	597 (23.1)	
Quartile 1	1620 (23.3)	299 (24.5)	675 (20.8)	646 (25.7)	
Educational level					
Tertiary	1218 (15.9)	405 (26.1)	420 (15.7)	393 (10.7)	0.000
Secondary	3306 (45.1)	778 (56.9)	1579 (59.3)	949 (25.5)	
Primary	2097 (24.6)	330 (15.7)	792 (22.6)	1075 (31.3)	
No formal education	1345 (14.4)	20 (1.3)	119 (2.4)	1206 (32.6)	
Occupation 1.					
Skill 3	1994 (28.6)	578 (39.0)	738 (31.6)	678 (19.8)	0.000
Skill 2	3561 (50.4)	678 (49.5)	1324 (52.9)	1559 (48.8)	
Skill 1	1016 (13.4)	145 (10.4)	330 (11.7)	541 (16.7)	
Never worked	642 (7.6)	18 (1.1)	127 (3.7)	497 (14.7)	
BEHAVIORAL FACTORS					
Daily smoker					
Never	3877 (46.2)	533 (35.4)	1407 (44.6)	1937 (53.5)	0.000
In the past	2568 (35.0)	711 (50.0)	843 (33.1)	1014 (28.6)	
Currently	1521 (18.8)	189 (14.6)	660 (22.3)	672 (17.8)	
Obesity*	2878 (35.8)	453 (31.7)	1084 (38.0)	1341 (35.9)	0.008
Sedentary*	2550 (30.5)	373 (26.0)	1019 (31.7)	1158 (31.8)	0.018
MATERIAL FACTORS					
Financial strains*	802 (9.3)	71 (5.3)	294 (9.5)	437 (11.3)	0.000
Private Insurance*	1704 (22.6)	515 (36.6)	581 (21.6)	608 (16.0)	0.000
Labor situation					
Working	2229 (31.3)	518 (38.8)	855 (35.0)	856 (23.7)	0.000
Retired	4102 (52.8)	828 (57.4)	1663 (56.5)	1611 (46.9)	
Unemployed	1021 (11.3)	16 (1.0)	202 (5.8)	803 (22.1)	
Homemaker	374 (4.6)	37 (2.8)	77 (2.7)	260 (7.3)	
PSYCHOSOCIAL FACTORS					
Loneliness*	1053 (11.5)	84 (5.9)	497 (13.3)	472 (12.8)	0.000
Social isolation					
Low	5103 (63.4)	895 (61.2)	2036 (68.7)	2172 (59.7)	0.000
Medium	2475 (31.5)	444 (32.0)	723 (25.8)	1308 (36.4)	
High	388 (5.1)	94 (6.8)	151 (5.5)	143 (3.9)	
Marital status					
Single	693 (8.2)	117 (8.5)	266 (7.9)	310 (8.5)	0.006
Married	4819 (65.0)	912 (64.9)	1650 (68.1)	2257 (62.1)	
Separated / divorced	2454 (26.8)	404 (26.6)	994 (24.0)	1056 (29.4)	
CHRONIC CONDITIONS*					
Major depression	663 (7.7)	55 (3.9)	174 (5.2)	434 (12.1)	0.000
Arthritis	2133 (26.5)	393 (26.9)	759 (25.8)	981 (26.8)	0.757
Angina	946 (11.6)	157 (10.5)	554 (17.6)	235 (6.6)	0.000
Asthma	548 (6.6)	123 (8.6)	195 (5.8)	230 (6.3)	0.013
Diabetes	1056 (12.5)	163 (11.3)	380 (11.5)	514 (14.0)	0.042
Hypertension	3563 (45.1)	589 (40.7)	1518 (52.4)	1456 (40.7)	0.000
Chronic lung disease	427 (5.3)	36 (2.9)	159 (5.1)	232 (6.7)	0.000
Stroke	330 (4.4)	57 (4.0)	141 (4.3)	132 (4.6)	0.738

Unweighted frequencies (*n*) and weighted proportions are displayed. The difference in proportions among countries was tested by Chi-squared tests and *p*-values are displayed. *Categories of reference: male, body mass index below 30, moderate or high physical activity, without financial strains, without private insurance, below 6 on the 3-item UCLA loneliness scale, and without chronic condition.

to information about risk (Adler and Newman, 2002; van Lenthe et al., 2004). In line with the results of the present study, smoking (An and Xiang, 2015), physical activity (Strawbridge et al., 2002) and Body Mass Index (Oh et al., 2017) have been associated with depression. However, the factors taken into account as mediators by the present study explained 28.6% of the association between educational level and depression, contrasting with 46.6% for the association between depression and household income. This suggests that other pathways exist, particularly in the association between educational level and depression. In fact, other researchers found developing cognitive abilities to be an important pathway in the association between educational level and depression or quality of life (Lara et al., 2017; Lee, 2011). Thus, future studies comparing distinct pathways between SES and

depression should take into account cognitive ability as a potential mediator.

Although psychosocial factors and particularly loneliness were strongly associated with depression, confirming the findings of several studies (Cacioppo et al., 2006; Domènech-Abella et al., 2017a), the association between socio-economic status and loneliness is still unclear and a mixed results have been obtained (Hansen and Slagsvold, 2015; Zebhauser et al., 2015). According to the present study, psychosocial factors did not significantly mediate the association between SES and depression. This, in addition to the independence of marital status, social isolation and loneliness in their associations with depression found in the present study, is consistent with a 5-year longitudinal study on the prospective associations between loneliness and depressive

Table 2

Factors related to depression.

	Model 1	Model 2
Household income		
Quartile 4	Ref.	Ref.
Quartile 3	1.23 (0.93, 1.61)	1.01 (0.75, 1.36)
Quartile 2	**1.39 (1.07, 1.80)**	0.97 (0.73, 1.30)
Quartile 1	**2.04 (1.58, 2.63)**	1.18 (0.87, 1.59)
Educational level		
Tertiary	Ref.	Ref.
Secondary	**1.56 (1.13, 2.15)**	1.21 (0.84, 1.75)
Primary	**2.42 (1.74, 3.37)**	1.24 (0.83, 1.85)
No formal education	**6.10 (4.39, 8.49)**	**2.13 (1.39, 3.27)**
Occupation 1.		
Skill 3	Ref.	Ref.
Skill 2	**1.56 (1.24, 1.96)**	1.00 (0.76, 1.31)
Skill 1	**2.38 (1.82, 3.12)**	1.00 (0.71, 1.39)
Never worked	**2.88 (2.15, 3.87)**	1.42 (0.90, 1.22)
BEHAVIORAL FACTORS		
Daily smoker		
Never	Ref.	Ref.
In the past	**0.80 (0.65, 0.98)**	1.00 (0.79, 1.27)
Currently	**1.29 (1.04, 1.61)**	**1.31 (1.01, 1.69)**
Obesity*	**1.66 (1.41, 1.95)**	**1.26 (1.05, 1.52)**
Sedentary*	**1.62 (1.37, 1.91)**	1.12 (0.93, 1.36)
MATERIAL FACTORS		
Financial strains*	**3.49 (2.87, 4.25)**	**2.01 (1.60, 2.53)**
Private Insurance*	**1.50 (1.20, 1.86)**	1.02 (0.80, 1.30)
Labor situation		
Working	Ref.	Ref.
Retired	**1.97 (1.54, 2.53)**	**1.44 (1.10, 1.90)**
Unemployed	**2.70 (2.03, 3.59)**	1.11 (0.74, 1.66)
Homemaker	**2.79 (1.94, 4.00)**	1.32 (0.88, 1.98)
PSYCHOSOCIAL FACTORS		
Loneliness*	**5.34 (4.48, 6.36)**	**4.45 (3.66, 5.42)**
Social isolation		
Low	Ref.	Ref.
Medium	**1.57 (1.32, 1.86)**	1.12 (0.93, 1.36)
High	**2.45 (1.80, 3.32)**	**1.92 (1.36, 2.72)**
Marital status		
Single	Ref.	Ref.
Married	**1.39 (1.03, 1.86)**	1.19 (0.86, 1.64)
Separated / divorced	**1.98 (1.65, 2.37)**	**1.32 (1.08, 1.62)**
CHRONIC CONDITIONS*		
Arthritis	**2.25 (1.90, 2.65)**	**1.67 (1.38, 2.01)**
Angina	**2.30 (1.87, 2.83)**	**1.89 (1.47, 2.42)**
Asthma	**2.55 (2.01, 3.23)**	**1.49 (1.11, 2.01)**
Diabetes	**1.67 (1.35, 2.06)**	1.14 (0.90, 1.45)
Hypertension	**1.45 (1.24, 1.73)**	**1.22 (1.01, 1.47)**
Chronic lung disease	**3.78 (2.94, 4.85)**	**1.76 (1.28, 2.42)**
Stroke	**1.75 (1.25, 2.46)**	1.23 (0.84, 1.80)
Country		
Finland	Ref.	Ref.
Poland	**1.56 (1.14, 2.13)**	0.92 (0.66, 1.29)
Spain	**3.51 (2.63, 4.68)**	**2.26 (1.61, 3.17)**

Note: Logistic regression models adjusted for age and sex. Model 2 is also adjusted for all variables showed by the col. Odds Ratio (95% confidence interval) are displayed. *Categories of reference (ref.): male, body mass index below 30, moderate or high physical activity, without financial strains, with private insurance, below 6 on the 3-item UCLA loneliness scale, and without chronic condition. In bold, significant associations ($p < 0.05$).

symptoms, according to which this temporal association was not attributable to demographic variables or objective social isolation (Cacioppo et al., 2010).

Overall, the prevalence of depression was significantly lower in Finland than in Spain, with Poland at an intermediate point. Significant interactions between country of residence and SES markers with depression as outcome were not found and the association between higher likelihood of depression and living in Spain remains significant after adjusting the association for SES markers and mediator factors. Therefore, a higher percentage of depression in Spain could be due to external factors such as income inequality at the country-level.

The results of the present study are consistent with research which

compared countries according to their Gini coefficient and suggesting 0.3 as a potential threshold over which the impact of income inequality on health may become significantly higher (Kondo et al., 2012). This could explain why the association between living in Spain and depression remains statistically significant after adjusting the association for SES markers and mediator factors.

In contrast, our results were not consistent with a recent study comparing 23 European countries, according to which the general health status of the population must be poorer in Poland than in Spain (Muntaner et al., 2017). However, this study was not focused on depression and used data from 2003 to 2010 and perhaps the effect of the financial crisis not was as evident as it is nowadays. In fact, previous studies showed a stronger impact of the financial crisis on Spain compared with other European countries as a consequence of austerity policies (Karanikolos et al., 2013) which have been found to have an impact on depression prevalence (Reibling et al., 2017).

4.1 Strengths and limitations of the study

The strengths of our study include the use of community-representative data, a sample of older adults from a variety of socioeconomic backgrounds and the ability to control for confounding factors. However, several limitations should be kept in mind. First, the cross-sectional design limited the possibility of examining causal relationships. However, two of the main independent variables were time invariant factors such as educational level and highest occupation skill among older adults. Second, there are more behavioral, material and psychosocial factors than are taken into account in the present study. Although we selected the most important mediator factors according to the literature reviewed, some factors such as financial strain was assessed in a crude way and it is possible that another study with a more extensive factor selection could obtain more comprehensive results. Thirst, some of the variables were collected retrospectively through self-report, which may result in recall or reporting bias. However, recall biases are usually relatively minor in epidemiological studies regarding the presence of specific chronic diseases and the influence of patient characteristics, including socioeconomic factors and depressive symptomatology (Kriegsman et al., 1996). Finally, the response rate in the COURAGE project ranged from 53 to 70%, and therefore there was a possibility of sample selection bias; however, even though there are no strict standards, these response rates can be considered adequate (Draugalis et al., 2008) and similar to the ones found in other European general population studies such as SHARE (Börsch-Supan, et al., 2005).

5. Conclusions

Our findings are of interest in disentangling various components of the complex associations between socioeconomic circumstances and depression in older adults. Education was the SES indicator most frequently significantly associated with depression, whereas psychosocial factors and loneliness showed the strongest associations with depression, although material factors and financial strain especially seemed to have a higher mediating function in the association between SES and depression. Therefore, improving psychosocial and material dimensions as well as access to the educational system for older adults might result in a reduction in the prevalence of depression in the general population of older adults and particularly among individuals with low SES. Future studies with longitudinal data are needed to reinforce these findings.

Contributors

The study design was planned by JD-A, ML, SC, BT-A, SK, JLA-M, and JMH. JD-A conducted the data analyses. JD-A and JM drafted the article. JMH supervised the data analyses and development of the paper. The paper was edited and reviewed by all the authors.

Table 3

Logistic regression analyses of the association between SES markers and depression (outcome) with distinct groups of variables as mediators (khb method).

Mediator	IV: Household Income Coefficient (95% CI)	% Mediated	IV: Educational Level Coefficient (95% CI)	% Mediated	IV: Occupation Skill Coefficient (95% CI)	% Mediated
Behavioral factors						
Total	**0.59 (0.33, 0.85)**		**1.11 (0.75, 1.47)**		**0.52 (0.24, 0.81)**	
Direct	**0.55 (0.29, 0.81)**		**1.02 (0.66, 1.38)**		**0.48 (0.19, 0.76)**	
Indirect	0.04 (−0.02, 0.09)	6.8%	**0.09 (0.02, 0.16)**	8.1%	0.05 (−0.01, 0.11)	9.6%
Material factors						
Total	**0.54 (0.28, 0.80)**		**1.08 (0.72, 1.44)**		**0.50 (0.21, 0.78)**	
Direct	**0.32 (0.05, 0.59)**		**0.91 (0.55, 1.28)**		**0.38 (0.09, 0.67)**	
Indirect	**0.22 (0.13, 0.31)**	40.7%	**0.17 (0.07, 0.26)**	15.7%	**0.12 (0.04, 0.20)**	24%
Psychosocial factors						
Total	**0.61 (0.34, 0.88)**		**1.15 (0.78, 1.51)**		**0.48 (0.19, 0.78)**	
Direct	**0.53 (0.27, 0.80)**		**1.03 (0.66, 1.40)**		**0.35 (0.06, 0.64)**	
Indirect	0.08 (−0.05, 0.20)	13.1%	0.12 (−0.02, 0.25)	10.4%	**0.13 (0.00, 0.26)**	27.1%
All mediators						
Total	**0.58 (0.30, 0.85)**		**1.12 (0.76, 1.49)**		**0.50 (0.20, 0.79)**	
Direct	**0.30 (0.02, 0.59)**		**0.81 (0.43, 1.19)**		0.24 (−0.06, 0.54)	
Indirect	**0.27 (0.12, 0.43)**	46.6%	**0.32 (0.15, 0.49)**	28.6%	**0.26 (0.10, 0.41)**	52.0%
Remaining SES markers						
Total	**0.57 (0.31, 0.83)**		**1.10 (0.74, 1.45)**		**0.50 (0.21, 0.79)**	
Direct	**0.40 (0.13, 0.67)**		**0.88 (0.47, 1.29)**		0.15 (−0.17, 0.48)	
Indirect	**0.17 (0.07, 0.27)**	29.8%	**0.22 (0.00, 0.44)**	20.0%	**0.35 (0.17, 0.53)**	70.0%

Note: All models are adjusted for age, sex, chronic physical conditions and country of residence. Among SES markers, differences between the highest level (as category of reference) and lowest level are analyzed (quartile 4 vs. quartile1, tertiary studies vs. no formal education, and skill 3 vs. skill 1). IV = independent variable; CI = confidence interval. In bold, significant associations ($p < 0.05$).

Conflict of interest

The authors declare that they have no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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3.2.-Anxiety, depression, loneliness and social network in the elderly: Longitudinal associations from The Irish Longitudinal Study on Ageing (TILDA)

Paper 2

Anxiety, depression, loneliness and social network in the elderly: Longitudinal associations from The Irish Longitudinal Study on Ageing (TILDA)

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Research paper

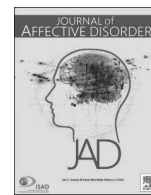# Anxiety, depression, loneliness and social network in the elderly: Longitudinal associations from The Irish Longitudinal Study on Ageing (TILDA)

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ABSTRACT

Background: Social network, loneliness, generalized anxiety disorder (GAD) and major depression disorder (MDD) are interrelated. However, as the directions of these associations are still unclear, we examined them prospectively using community-based data.
Methods: Data on 5066 adults aged ≥50 years from The Irish Longitudinal Study on Ageing (TILDA) were analyzed. Loneliness was assessed through the UCLA loneliness scale. Social integration was measured using the Berkman–Syme Social Network Index. MDD and GAD were assessed with the Composite International Diagnostic Interview (CIDI). Logistic regression models were conducted.
Results: The longitudinal association between experiencing loneliness and higher likelihood of suffering from MDD or GAD two years later is bidirectional but stronger with loneliness as origin, whereas the association between social isolation and higher likelihood of subsequent MDD or GAD as well as those between loneliness and subsequent deterioration of social integration are unidirectional.
Conclusion: Objective and perceived social isolation independently affect the probability of suffering from MDD or GAD whereas loneliness is a risk factor for the deterioration of social life, which highlights the need to address the subjective factors (such as loneliness) and objective factors (such as social network size) of social isolation in a complementary way in order to improve the mental health of the older adult population.

1. Introduction

Major depressive disorder (MDD) and generalized anxiety disorder (GAD) are among the most prevalent mental disorders among middle-aged and older people (hereinafter referred to as "older adults") (Beekman et al., 1998; Byers et al., 2010). In Ireland, the 12-month prevalence of MDD and GAD in adults aged 45–64 has been reported to be 7% and 4%, respectively, while among those aged 65 years and over, it is 3% and 1%, respectively (Barry et al., 2009). MDD has a significant impact on older populations and is linked to higher risk of suicide, all-cause mortality and increasing health service use (Blazer, 2003). Similarly, GAD is associated with chronic medical conditions, a higher burden on the health care system and lower health-related quality of life (Porensky et al., 2009).

According to a systematic review, the main predictors of depressive disorders and symptoms in the elderly are female gender, somatic illness, cognitive impairment, functional disability, lack or loss of close social contacts and clinical history of depression (Djernes, 2006). Another comprehensive review that also assessed risk factors for anxiety revealed that few studies have explored this issue. The findings of these studies showed that risk factors for anxiety are similar to those for depression although biological factors seemed more important in predicting depression than anxiety. The study also showed that social factors affected depression and anxiety differently: low contact frequency and being childless were associated with anxiety, whereas smaller network size and being unmarried were associated with

depression (Vink et al., 2008).

Poor mental health has clearly been linked to objective social isolation (Levula et al., 2016; Thoits, 2011), as well as to subjective measures such as perceived social support or loneliness, which have been of increasing interest to researchers over the last few decades (Wang et al., 2018). Social isolation is defined as a measurable lack of social relationships, while loneliness is synonymous with perceived social isolation, not with objective social isolation (Hawkley et al., 2010). Approximately 10% of older adults suffer from "chronic loneliness" in Ireland and about 7% reported being socially isolated in the baseline of The Irish Longitudinal Study on Ageing, of which 60% said they do not feel lonely (Harvey and Walsh, 2016).

In older adults, social isolation and loneliness have been shown to negatively affect a range of health outcomes, including all-cause mortality (Pantell et al., 2013; Rico-Uribe et al., 2016; Steptoe et al., 2013). Being female, previously married, unemployed, with a low educational level, low household income, and living in a rural area are sociodemographic factors associated with a higher likelihood of social isolation and loneliness among older adults (Cohen-Mansfield et al., 2016).

Although the association between social isolation and loneliness has been found to be only weak-to-moderate among older adults (Cornwell and Waite, 2009), most researchers presuppose that loneliness is caused by social isolation (Dahlberg et al., 2018; Routasalo et al., 2006). However, according to the Evolutionary Theory of Loneliness (ETL), the perception of being socially isolated (i.e., lonely) causes "behaviors categorized in terms of evolutionary fitness as selfish" (Cacioppo and Cacioppo, 2018). In other words, the individual unconsciously attributes the feeling of loneliness to a negative perception of their social context that fosters selfish behavior. Therefore, the adaptive functions of loneliness that foster short-term survival, in the modern world can have long-term deleterious consequences and loneliness could cause an increase in social isolation.

Although the association between social network and depression is widely recognized (Santini et al., 2015), whether loneliness causes depression or depression increases the feelings of loneliness, or both, has not been fully established and contrasting results have been reported (Cacioppo et al., 2010; Dahlberg et al., 2014; Domènech-Abella et al., 2017a). The relationship between anxiety and factors related to social network has been studied less than the relationship with depression but researchers have taken into account both directions of these associations: anxiety disorders influence social support, contact with family of origin and neighborhood quality (Cramer et al., 2005), while social disability in patients with depression or anxiety predicts a diagnosis of depression or anxiety two years later (Saris et al., 2017).

The Irish Longitudinal Study on Ageing (TILDA) showed that loneliness was a significant mediator in the association between social network components and symptoms of depression but not anxiety symptoms (Santini et al., 2016). In contrast, in a longitudinal study conducted in Chicago, researchers reported that the temporal association between loneliness and depression was not attributable to the size or quality of social networks (Cacioppo et al., 2010) and, in the context of the Longitudinal Aging Study Amsterdam, loneliness and social network were found to have an independent effect on the course of depression (Houtjes et al., 2014).

Although most studies report anxiety as predictor of depression, a recent meta-analysis proposed that anxiety and depression symptoms are bi-directionally and prospectively associated with one another strongly over shorter time periods and weakly over longer time periods (Jacobson and Newman, 2017). Relational factors such as mechanisms of these associations have been found taking GAD or anxiety symptoms as predictive of depression. For example, low perceived emotional social support have been found to be mediator in the association between depressive and anxiety symptoms 48 months later for bereaved individuals (Jacobson et al., 2017b), interpersonal oversensitivity and social chronic stress have been found as mediating the relationship

between GAD before age 15 and later depression (Starr et al., 2014), and perceptions of not being accepted or loved were found to significantly mediate the relationship between adolescent anxiety and clinical depression in adulthood (Jacobson and Newman, 2016). However, no prior research has examined the mechanism of this relationship in an older adult population.

Our aim was to test longitudinal associations, taken from the contrasting approaches in the literature reviewed, in which MDD, GAD, social networks and loneliness were involved: (a) the association between MDD and GAD and changes in loneliness and vice versa, (b) the association between affective disorders and changes in social network and vice versa, (c) the association between social networks and changes in loneliness and vice versa. Following the literature reviewed on the causal mechanisms between GAD and MDD, we hypothesized that GAD would precede social isolation and feelings of loneliness and that these would lead to MDD, whereas the longitudinal association between GAD and MDD would be bidirectional. However, we were not able to provide a clear hypothesis regarding the relationship between social isolation and loneliness due to the contradictory approaches.

2. Methods

2.1. Study design

The Irish Longitudinal Study on Ageing (TILDA) is a large prospective study of the social, economic and health circumstances of community-dwelling adults aged 50 years and older in Ireland. Details of sampling and study design have been described previously (Whelan and Savva, 2013). The first wave was collected between October 2009 and July 2011 with 8175 eligible participants aged 50 and over and 329 younger partners. Participants completed a computer-assisted personal interview (CAPI) and were asked to fill in a self-completion questionnaire (SCQ) and return it by post. The overall household response rate to the CAPI at Wave 1 was 62% participants of which 85% returned the SCQ. The second wave was collected between April 2012 and January 2013. An overall response rate of 86% was achieved and 84% of Wave 2 respondents returned the SCQ. The third wave was collected between March 2014 and October 2015. The overall response rate was 85% participants of which 85% returned the SCQ.

As baseline measurements of MDD and GAD were not taken, the present analysis is based on data obtained in wave 2 and wave 3 ($n = 6189$). Among them, those younger than 50 years old ($n = 275$), with missing values on SNI components ($n = 163$) and those who did not complete the SCQ (including those with several cognitive impairment; $n = 685$) were excluded. The last inclusion criterion is justified since SCQ included the UCLA loneliness scale (Russell, 1996). The sample size after restriction of these individuals was 5066 (see Fig. 1).

2.2. Ethics statement

Ethics approval was obtained from the Faculty of Health Sciences Research Ethics Committee at Trinity College, Dublin and participants provided written informed consent.

2.3. Measures

The Composite International Diagnostic Interview–Short Form (CIDI-SF) was used by lay interviewers for the assessment of MDD in the past 12 months and GAD lasting six months or longer. More information on the CIDI is available elsewhere (Kessler et al., 1998).

There is no consensus on how to measure social isolation / integration. However, we have used the Berkman–Syme Social Network Index (SNI) (Berkman and Syme, 1979), which has been used by several researchers (Santini et al., 2016; Cacippo et al., 2010). Four dichotomous variables were summed to generate a total SNI: being married or living with a partner, having close friends or relatives, belonging to a
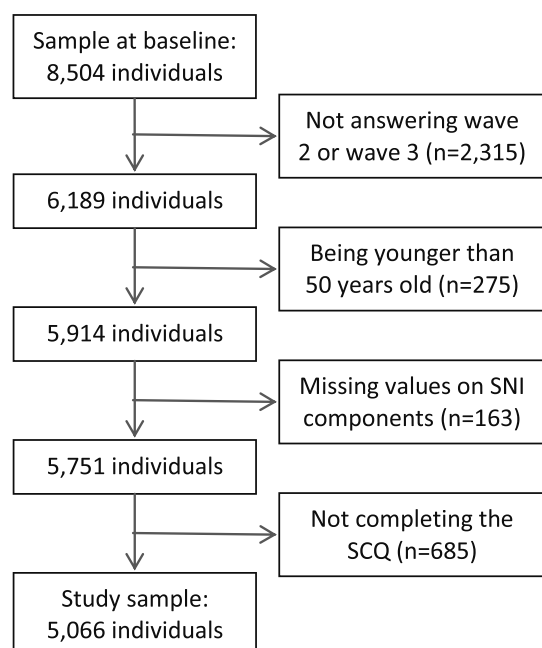
Fig. 1. Flowchart of the study sample.

voluntary group or club, attending church services at least twice a month. The composite score ranged from 0 to 4 and was classified according to the standard categorization: 0–1 as most isolated, 2 as moderately isolated, 3 as moderately integrated, and 4 as most integrated.

There is no consensus on the dimensional nature of loneliness. For the present study, it is considered as a one-dimensional construct, as the researchers at the University of California-Los Angeles (UCLA) proposed (Russell, 1996). The UCLA loneliness scale is a 5-item scale including "How often do you feel isolated?" and "How often do you feel lonely?". Response categories ranged from 0 (hardly ever or never) to 2 (often). The scores were summed to create a scale ranging from 0 to 10, with higher scores indicating greater levels of loneliness.

The internal validity of the loneliness scale was assessed using Cronbach's alpha. Correlation between loneliness scale and SNI was also evaluated. The scale showed good internal consistency ($\alpha = 0.79$) while the correlation was low ($r = 0.20$) indicating adequate discriminant validity between loneliness scale and SNI.

Sociodemographic characteristics included age, sex, education, financial circumstances, widowhood, employment status and place of residence. Age was categorized as 50–59, 60–69, 70–79, and ≥80 years old. Education was classified as follows: primary (some primary/not complete; primary or equivalent); secondary (intermediate/junior/group certificate or equivalent; leaving certificate or equivalent); and tertiary (diploma/certificate; primary degree; postgraduate/higher degree). Financial strain was assessed by responding to the statement "shortage of money stops me from doing the things I want to do" and answers were coded as follows: 1 (never); 2 (rarely); 3 (sometimes); and 4 (often). Employment status was categorized as employed, retired/disabled, unemployed, homemaker and other. Place of residence was dichotomized into urban (Dublin city or county/another town or city) and rural.

According to the CAPI questionnaire, we distinguished heart diseases and remaining chronic, somatic conditions and two indicators were created: heart diseases and other diseases. In both cases, the number of chronic conditions was assessed through the question: "has a doctor ever told you that you have any of the conditions on this card?". In the case of heart diseases, responses included 11 conditions as follows: high blood pressure or hypertension, angina, heart attack

(including myocardial infarction or coronary thrombosis), congestive heart failure, diabetes or high blood sugar, stroke (cerebral vascular disease), ministroke or transient ischemic attack, high cholesterol, heart murmur, abnormal heart rhythm, and any other heart trouble. In the case of remaining somatic diseases, responses includes 9 conditions as follows: chronic lung disease such as chronic bronchitis or emphysema, asthma, arthritis (including osteoarthritis, or rheumatism), osteoporosis, sometimes called thin or brittle bones, cancer or a malignant tumor (including leukemia or lymphoma but excluding minor skin cancers), serious memory impairment, stomach ulcers, varicose ulcers (an ulcer due to varicose veins), and cirrhosis, or serious liver damage. In both cases, the total number of chronic medical conditions was calculated and categorized as 0 (none), 1–2 and ≥3.

2.4. Statistical analysis

The statistical analyses took into account the stratified study design. Sampling weights were generated, adjusting for the population distribution obtained from the national census and for non-response in order to obtain nationally representative estimates (Moussavi et al., 2007).

More than 12% of individuals did not complete the UCLA loneliness Scale. We cannot be certain about the reasons for the missing data, but no major discrepancy was found between imputed data and complete-case analysis so we are leaning towards imputed data as missing at random. Missing values were imputed using multiple imputation by chained equations through the predictive mean matching method. The imputation model included important sociodemographic and health-related variables associated with drop-outs. Thirty imputed databases were created. The number of imputations was calculated using a rule of thumb with respect to the fraction of missing information ($M > 100 \times FMI$) (Rubin, 2004).

Descriptive analyses were conducted to characterize the study sample These analyses included weighted proportions and unweighted frequencies. The stability of outcome variables was analyzed by calculating the kappa coefficient between wave 2 and wave 3 and suggesting the following interpretations (Landis and Koch, 1977): 0.00–0.20 Slight; 0.21–0.40 Fair; 0.41–0.60 Moderate; 0.61–0.80 Substantial; and 0.81–1.00 Almost perfect. In addition, the proportion of individuals that improved, got worse, or remained stable were plotted for each outcome variable.

Logistic regression models were fitted to test the relationship between SNI, loneliness, MDD and GAD with the likelihood of suffering from each affective disorder, whereas ordered logistic regression models were used to evaluate these variables as predictors of changes in SNI or loneliness. In all cases, outcome variables were fitted at wave 3 and adjusted for the same variable at wave 2. Later, the models were also adjusted for all covariates (age cohorts, place of residence, employment status, financial strain, education, heart diseases, somatic diseases, affective disorders, loneliness, widowhood and SNI). Odds ratio (95% confidence interval) and significance when $p < 0.05$ were reported in each model.

3. Results

The mean (SE) age at baseline was 63.3 (0.16) years and 51.8% of the sample were women. Study sample characteristics are presented in Table 1. Table 2 shows outcome variable score stability between Wave 2 and Wave 3. SNI showed a lower percentage of participants improving from wave 2 to wave 3 (9.7% among the isolated and 5.8% among the integrated) whereas loneliness showed a higher percentage (23.7% among those with or without some loneliness and 64.4% among those with higher levels of loneliness). Among participants who suffered from MDD or GAD at wave 2, 22.8% and a 25.1%, respectively, presented no active episode at wave 3. SNI showed substantial agreement between two waves (kappa > 0.61), whereas for remaining

Table 1
Characteristics of the study sample.

	n (%)
Overall	5066 (100)
Sex	
Female	2775 (51.8)
Age cohorts	
50–59	2133 (43.2)
60–69	1744 (33.1)
70–79	961 (18.4)
80 +	228 (5.3)
Place of residence	
Rural	2775 (49.7)
Employment	
Employed	1989 (39.0)
Retired / disabled	2021 (38.1)
Unemployed	234 (5.5)
Homemaker	731 815.7)
Other	91 (1.7)
Financial strain	
Often	830 (19.0)
Sometimes	1818 (37.1)
Rarely	1195 (22.3)
Never	1134 (22.7)
Education	
Primary	1233 (33.2)
Secondary	2120 (45.9)
Tertiary	1713 (20.9)
Heart diseases	
0	1848 (36.2)
1–2	2675 (52.9)
3–7	543 (10.9)
Other diseases	
0	2628 (52.2)
1–2	2266 (44.2)
3–7	172 (3.6)
Affective disorders	
Depression	289 (5.9)
Anxiety	142 (2.8)
Loneliness (0–10)	
Mean (CI)	1.92 (1.86, 1.97)
Social Network Index	
Most isolated	356 (7.1)
Moderately isolated	1327 (26.2)
Moderately integrated	2079 (41.0)
Most integrated	1304 (25.7)
Widow(er)	600 (11.9)

n = unweighted frequency; % = weighted proportion; DV = dependent variable; CI = confidence interval.

outcome variables the agreement was fair (kappa between 0.21 and 0.40).

Logistic regression models (Tables 3 and 4) reported factors at wave 2 (as covariates) related to depression, anxiety, loneliness and SNI at wave 3 (as outcomes). In Table 3, each variable was adjusted for the outcome of each model at wave 2. A lower level of loneliness at wave 2 was associated with a higher probability of having depression, anxiety and a lower level of social isolation at wave 3. Suffering from affective disorders at wave 2 was associated with suffering from them at wave 3 and with worsening levels of loneliness and social integration. Finally, a higher level of social integration at wave 2 was related to a lower probability of suffering from depression or anxiety at wave 3 and, to a lesser extent, with worse levels of loneliness.

In Table 4, factors were also adjusted between one another and for the remaining covariates shown in Table 1. All the factors tested in Table 3 remained significantly associated with the outcomes, apart from SNI and depression in Model 3 (with loneliness as outcome) and both affective disorders in Model 4 (with SNI as outcome).

4. Discussion

The present study analyzed hypothetical bidirectional longitudinal associations involving affective disorders, social network index (SNI) or feeling of loneliness. The aim was to clarify the contrasting results found in the literature reviewed. Partially supporting our hypothesis, the longitudinal association between MDD and GAD was found to be bidirectional whereas GAD but not MDD predicted loneliness. However, neither GAD nor MDD predicted objective social isolation whereas loneliness and objective social isolation predicted MDD and GAD.

The results showing loneliness as a predictor of changes in social isolation but not vice versa is in contrast with several studies. Although social network-related factors have normally been considered as predictors of loneliness (Dahlberg et al., 2018; Routasalo et al., 2006), some researchers report that loneliness and social isolation have only a weak-to-moderate positive correlation (Cornwell and Waite, 2009) among the oldest adults and suggest that it is due to a preparation of the individual for diminished social networks when these oldest adults begin experience impairment in the physical and mental capacities needed for social engagement (Achenbaum and Bengtson, 1994; Cornwell and Waite, 2009). Some researchers also observe that the prevalence of solitary living increases with age whereas feelings of loneliness decrease (Stepler, 2016). The absence of evidence indicating increasing loneliness and decreasing psychosocial well-being in the aging process are associated with the idea that older people can do as well or sometimes even better than young people with regard to happiness or self-acceptance (Domènech-Abella et al., 2017b,c). In addition, according our results, the hypothetic decoupling between loneliness and social networks in the old age could be also due to an unidirectional association of high levels of loneliness with subsequent worsening social network characteristics, which could be explained using the Evolutionary Theory of Loneliness, according to which people tend to maintain selfish behavior when they feel loneliness, which harms their long-term social environment (Cacioppo and Cacioppo, 2018): therefore, among the oldest adults, there could be

Table 2
Percentages of worsening, unchanged, and improving from wave 2 to wave 3.

Status in Wave 2			Change in Wave 3			Kappa w2–w3
Variable	Categories	*n* (%)	Worsening	No change	Improving	
Loneliness	0–4	3979 (86.4)	22.6%	53.70%	23.70%	0.25
	5–10	592 (13.6)	9.10%	26.50%	64.40%	
SNI	Isolated	1683 (33.3)	14.10%	76.20%	9.70%	0.61
	Integrated	3383 (66.7)	23.60%	70.60%	5.80%	
MDD	Presence	289 (5.9)	–	77.20%	22.80%	0.21
	Absence	4777 (94.1)	3.90%	96.10%	–	
GAD	Presence	142 (2.8)	–	74.90%	25.10%	0.25
	Absence	4924 (97.2)	2.10%	97.90%	–	

Categories referred to as isolated include most and moderately isolated whereas those referred to as integrated include most and moderately integrated. Improvements in loneliness and SNI mean, respectively, getting close to 0 or the "most integrated" category according to the categories in Table 1. In the case of MDD and GAD, improving means progressing from suffering to not suffering. In all cases, worsening means the opposite. Kappa agreement coefficient was also calculated. SNI = social network index. MDD = major depressive disorder in the past 12 months. GAD = generalized anxiety disorder in the past12 months.

Table 3

Bivariate logistic regression models of the factors related to changes in depression, anxiety, loneliness and social network index (SNI).*.

	Model 1 Depression at wave 3 (DV)	Model 2 Anxiety at wave 3 (DV)	Model 3 Loneliness at wave 3 (DV)	Model 4 SNI at wave 3 (DV)
Affective disorders				
Depression at wave 2 (Ref. = no)	–	**3.92 (2.54, 6.04)**	**1.38 (1.08, 1.76)**	**0.73 (0.57, 0.95)**
Anxiety at wave 2 (Ref. = no)	**3.03 (1.88, 4.89)**	–	**1.76 (1.24, 2.50)**	0.75 (0.52, 1.08)
Loneliness at wave 2 (Scale from 0 to 10)	**1.27 (1.21, 1.35)**	**1.32 (1.24, 1.41)**	–	**0.92 (0.89, 0.95)**
SNI at wave 2				
Most isolated	Ref.	Ref.	Ref.	–
Moderately isolated	**0.45 (0.29, 0.69)**	**0.51 (0.30, 0.87)**	1.00 (0.78, 1.26)	–
Moderately integrated	**0.34 (0.22, 0.51)**	**0.49 (0.30, 0.81)**	0.91 (0.72, 1.15)	–
Most integrated	**0.31 (0.19, 0.50)**	**0.24 (0.13, 0.44)**	**0.77 (0.60, 0.98)**	–

Model 1 and Model 2 are logistic regression models whereas Model 3 and Model 4 are ordered logistic regression models. Odds ratio with 95% confidence interval are displayed. SNI = social network index, Ref. = category of reference, DV = dependent variable, IV = independent variable. In bold, significant associations ($p < 0.05$).

  * Models were only adjusted for the value of the dependent variable at wave 2 (depression in Model 1, anxiety in Model 2, Loneliness in Model 3 and SNI in Model 4.

increasing social isolation but not loneliness.

Apart from individual factors such as feelings of loneliness, social isolation is also induced by contextual factors such as limited opportunities to participate in social activities (Toepoel, 2013) and structural factors such as economic and social policies that produce and maintain socioeconomic inequalities (Nicholson, 2012). This could explain the high perpetuity of social isolation revealed by the results of the present study. In the field of interventions to reduce or prevent social isolation in later life, a recent review pointed out that social isolation reduction strategies such as one-to-one or group interventions seem to be less efficient in reducing social isolation than preventive strategies such as neighborhood or structural interventions (Cotterell et al., 2018).

The finding that low levels of SNI, and a higher level of loneliness in particular, are associated with a greater likelihood of subsequent generalized anxiety or major depression disorder is consistent with a recent case-control study on indicators of social functioning, using data from the Netherlands Study of Depression and Anxiety (NESDA). In this study, behavioral (such as components of SNI) and, with major intensity, affective indicators (such as loneliness) were found to be predictive of clinical anxiety or depression 2 years later, and especially in patients with comorbid disorders (Saris et al., 2017). In line with these results, in a systematic review Santini et al. (2015) highlighted the significant protective effects against depression of perceived support, and to a lesser degree, received support.

Anxiety and depression disorders are comorbid in a high proportion, which has been quantified as between 60% and 70% among depression or anxiety patients (Lamers et al., 2011). This high comorbidity can cause confusion about the effects on loneliness of each disorder. According to the present study, MDD is not significantly related to changes in loneliness after adjusting the association for GAD in the logistic

regression model, whereas neither disorder was found to be significantly associated with changes in SNI.

According to the present study, and in line with researchers who suggested an independent effect of loneliness and social isolation on mental health (Cacioppo et al., 2010; Houtjes et al., 2014), objective and perceived social isolation independently affect the probability of suffering anxiety or depression whereas loneliness is a risk factor for the deterioration of social life, which highlights the need to address the subjective factors and objective factors of social isolation in a complementary way with the aim of improving the mental health of the older adult population.

4.1. Limitation and strengths

The strengths of this study include the use of a large nationally representative sample of older adults with a heterogeneous socioeconomic background, the inclusion of covariates, and the longitudinal design that enables us to examine time relationships. However, we need to consider several limitations. First, comparability across studies is difficult given the measurement inconsistencies among them. Second, information on components of SNI was missing in about 7% of participants who were excluded. The results may have been different if these people had been included in the analysis although we did not find significant sociodemographic differences between those included or excluded. Third, since the data were based on self-report, reporting bias may exist. Fourth, as most participants were under 70 years old, there may have been too few subjects with psychiatric disorders typical of older individuals for us to study them adequately. However, our study is focused on older and middle-aged people since several European studies on aging used representative samples of individuals aged 50 and

Table 4

Adjusted logistic regression models of the factors related to changes in depression, anxiety, loneliness and social network index (SNI).*

	Model 1 Depression at wave 3 (DV)	Model 2 Anxiety at wave 3 (DV)	Model 3 Loneliness at wave 3 (DV)	Model 4 SNI at wave 3 (DV)
Affective disorders				
Depression at wave 2 (Ref. = no)	–	**2.32 (1.48, 3.65)**	1.18 (0.91, 1.52)	0.85 (0.65, 1.12)
Anxiety at wave 2 (Ref. = no)	**2.03 (1.24, 3.33)**	–	**1.60 (1.10, 2.34)**	0.93 (0.63, 1.37)
Loneliness at wave 2 (Scale from 0 to 10)	**1.22 (1.15, 1.30)**	**1.24 (1.16, 1.33)**	–	**0.93 (0.90, 0.96)**
SNI at wave 2				
Most isolated	Ref.	Ref.	Ref.	–
Moderately isolated	**0.58 (0.37, 0.92)**	0.69 (0.40, 1.20)	1.06 (0.83, 1.35)	–
Moderately integrated	**0.51 (0.33, 0.81)**	0.82 (0.48, 1.40)	0.99 (0.78, 1.25)	–
Most integrated	**0.57 (0.34, 0.96)**	**0.48 (0.25, 0.95)**	0.85 (0.66, 1.10)	–

Model 1 and Model 2 are logistic regression models whereas Model 3 and Model 4 are ordered logistic regression models. Odds ratio with 95% confidence interval are displayed. Ref. = category of reference, DV = dependent variable. In bold, significant associations ($p < 0.05$).

  * Models are adjusted for all covariates shown in Table 1.

older (Börsch-Supan et al., 2005; Steptoe et al., 2012; Whelan and Savva, 2013). Fifth, measures from The Composite International Diagnostic Interview (CIDI) were found to have a high false-positive rate in validation studies using clinical samples (Kurdyak and Gnam, 2005). However, other researchers suggested that the CIDI was designed for community-based samples and concluded that it is potentially useful for monitoring general mental health although it is not a substitute for specific mental health measures (Mawani and Gilmour, 2010). Finally, the follow-up period was short and results could vary with a longer follow-up. Future studies in different settings and countries are needed to replicate our findings on the longitudinal associations in affective disorders, loneliness and social networks.

5. Conclusions

The results of this study have highlighted the difficulties of socially isolated older adults in reconstructing or improving the characteristics of their social networks. Only 9.7% of moderately or most isolated older people managed to improve their relational situation two years later and, among the most isolated, none improved to better than moderately isolated; a situation that may be progressively aggravated by feelings of loneliness. Both objective social isolation and loneliness factors have been found to be robust risk factors for depression and anxiety independently, which acts as a warning not to underestimate the subjective aspects of social isolation. However, it seems that reducing the prevalence of social isolation, which affects more than 30% of older adults in Ireland, is a challenge at least as important as alleviating loneliness, due to the difficulty of improvement without social interventions and their effect on mental health of older adults.

Contributors

The study design was planned by JD-A, MR-V, JM, and JMH. JD-A conducted the data analyses. JD-A and JM drafted the article. MR-V supervised the data analyses and development of the paper. The paper was edited and reviewed by all the authors.

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Conflict of interest

The authors declare that they have no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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3.3.-Loneliness and depression in the elderly: the role of social network

Paper 3

Loneliness and depression in the elderly: the role of social network

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ORIGINAL PAPER

Loneliness and depression in the elderly: the role of social network

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Abstract

Purpose Loneliness and depression are associated, in particular in older adults. Less is known about the role of social networks in this relationship. The present study analyzes the influence of social networks in the relationship between loneliness and depression in the older adult population in Spain.

Methods A population-representative sample of 3535 adults aged 50 years and over from Spain was analyzed. Loneliness was assessed by means of the three-item UCLA Loneliness Scale. Social network characteristics were measured using the Berkman–Syme Social Network Index.

Major depression in the previous 12 months was assessed with the Composite International Diagnostic Interview (CIDI). Logistic regression models were used to analyze the survey data.

Results Feelings of loneliness were more prevalent in women, those who were younger (50–65), single, separated, divorced or widowed, living in a rural setting, with a lower frequency of social interactions and smaller social network, and with major depression. Among people feeling lonely, those with depression were more frequently married and had a small social network. Among those not feeling lonely, depression was associated with being previously married. In depressed people, feelings of loneliness were associated with having a small social network; while among those without depression, feelings of loneliness were associated with being married.

Conclusion The type and size of social networks have a role in the relationship between loneliness and depression. Increasing social interaction may be more beneficial than strategies based on improving maladaptive social cognition in loneliness to reduce the prevalence of depression among Spanish older adults.

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Introduction

Loneliness has been defined as a discrepancy between desired and real social relations [1] and is associated with decreases in health status and quality of life [2]. The prevalence of chronic or frequent loneliness in Spain has been estimated at 4.4% for individuals aged <30 years, 6.5% for individuals between 30 and 59 years, and 11.5% for those aged ≥60 years [3]. Gender, age, marital status, employment status, education level, household income and

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urbanicity are sociodemographic factors associated with loneliness [4].

The association between loneliness and depression is well documented. Cacioppo et al. evidenced a strong association between loneliness and depression among older adults. They also observed that loneliness and depressive symptomatology can act in a synergistic way to diminish well-being in middle-aged and older adults [5]. Depression, as well as loneliness, has also been associated with the components of social networks (i.e., frequency of interactions and quality and size of social network). In a systematic review of the association between social relationships and depression, Santini et al. highlighted the protective effects of perceived emotional support, perceived instrumental support, and large, diverse social networks [6] whereas in another review, Cohen-Mansfield et al. identified quantitative and qualitative social network factors as also being related to loneliness [4].

However, whether loneliness causes depression or depression increases the feelings of loneliness, or both, has not been fully established. Strong evidence was provided by a 5-year longitudinal study on older adults conducted in Chicago which showed that loneliness predicted subsequent increases in depressive symptomatology, but not vice versa [7]. Conversely, a national longitudinal study among older adults in Sweden showed that increases in depressive symptomatology predicted loneliness [8].

Discordant findings have been reported in the relationship between loneliness, social networks and depression. In a study using data from The Irish Longitudinal Study on Ageing (TILDA), loneliness was found to be a significant mediator in the association between social network-related factors and depression [9]. On the other hand, in a longitudinal study conducted in Chicago, the researchers reported that the temporal association between loneliness and depression was not attributable to the size or quality of social networks [7]. In the context of the Longitudinal Aging Study Amsterdam, Houtjes et al. found that both loneliness and social network had an independent effect on the course of depression: the size of social network and degree of loneliness were both important predictors of the remission of depression among older adults [10].

These contradictory results could be a consequence of the different conceptualizations of loneliness used in the previous studies. The UCLA loneliness scale, the most frequently employed method to assess loneliness, was conceived as measuring a unidimensional construct [11]. However, several factor analyses are consistent with conceptualizations of loneliness as a multidimensional construct [12]. Weiss [13] proposed two types of loneliness: emotional loneliness, which results from the perception of lacking of an intimate attachment to another person;

social loneliness, which results from the perception of lacking of a network of social relationships in which the person is part of a group. Marital status and social network components have been found to be strong predictors of emotional and social loneliness, respectively [14]. According to Weiss, social loneliness is the type of loneliness which predicts depression.

The aim of the present study is to better understand the relationship between loneliness, social networks and depression and, specifically, whether Weiss's conceptualization of two types of loneliness may explain the role of loneliness and social networks in depression and the role of depression and social networks in loneliness. The tested hypotheses were: (1) the role of the different social network components in loneliness differs in individuals with or without depression; (2) the role of the different social network components in depression differs in individuals with or without loneliness.

Methods

Study design

This study was part of the Collaborative Research on Ageing in Europe (COURAGE in Europe) project [15], a European funded, cross-sectional survey of a non-institutionalized adult population (aged ≥18 years) conducted between April 2011 and May 2012. A total of 4753 participants were interviewed in Spain: 962 (18–49 years), 3312 (50–79 years) and 479 (80+ years). To achieve appropriate representation of the Spanish population, a stratified multistage clustered area probability method was used. Subgroups 50+ and 80+ years were oversampled, given that these individuals were the main target of the study. The survey response rate was 69.9%.

Face-to-face structured interviews were carried out at respondents' homes using Computer-Assisted Personal Interviewing (CAPI). The survey questionnaire was initially developed in English and then translated into Spanish following World Health Organization translation guidelines for assessment instruments [16]. Quality assurance procedures were implemented during fieldwork. When individuals had severe cognitive impairment, judged at the interviewer's discretion, a shorter version of the questionnaire was administered to a proxy.

For the current analyses, we excluded proxy respondents ($n = 170$) and 86 individuals with missing information on loneliness or social networks. Individuals aged <50 years ($n = 962$) were also excluded. Thus, the final analytical sample comprised 3535 participants.

Ethics statement

Ethical approval for the COURAGE study Spain was provided by Parc Sanitari Sant Joan de Déu, Barcelona, Spain, and Hospital la Princesa, Madrid, Spain. Written informed consent was obtained from the participants.

Measurements

Loneliness

Loneliness was assessed by means of the three-item UCLA Loneliness Scale [17], which consists of the following items: "How often do you feel that you lack companionship?"; "How often do you feel left out?"; "How often do you feel isolated from others?". Each item was answered on a 3-point scale (1 = hardly ever; 2 = some of the time; 3 = often). The UCLA Loneliness Scale has shown satisfactory reliability and both concurrent and discriminant validity [17]. In the present study, the 3-item UCLA Loneliness Scale showed acceptable internal reliability (Cronbach's alpha = 0.89; average inter-item correlation = 0.72). The scores for each item were added up to produce a loneliness scale from 3 to 9, with higher scores indicating a greater degree of loneliness. The cutoff point for loneliness was ≥ 6, in line with previous studies [18].

Social network components

A detailed description of the individual's social network was obtained which included the following components: (1) size of the network; (2) frequency of contact with members of the network; (3) quality of the network. These social network components are based on the structural dimension of the Berkman–Syme Social Network Index [19], which measures the size of the social network, closeness with members of the network, and frequency of contact. Size of the network was assessed by asking about the number of people in the network [i.e., "Please state the number of people (in total) who are so close to you at the present time that you: can talk to them about personal affairs, can get help from them in everyday matters, and/or enjoy spending your leisure time with them (please consider family members, friends, colleagues, etc.)"]. Frequency of contact with members of the network (also known as intensity of the network) and quality of the network were assessed with an index ranging from 0 to 8 by asking whether the participant had contact with the members of the network at least once per month in the previous 12 months and whether they had a close relationship with the participant. One point was assigned for each of the eight types of relationship: spouse or partner, parents, children, grandchildren, other relatives, co-workers, friends, and neighbors. This scoring method

is based on the Social Network Index proposed by Cohen [20], which assesses several types of relationships and has recently been validated for different European countries [21]. Total scores were dichotomized using the median value of frequency of contact and quality and size of the social network.

Depression

An adapted version of the Composite International Diagnostic Interview (CIDI 3.0) was used to assess the presence of depression in the previous 12 months [22]. An algorithm based on the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders was used [23].

Sociodemographic variables

Participants were also asked to provide socio-demographic information: age (in years), gender, level of education (less than primary, primary, secondary and tertiary), marital status (single, currently married or cohabiting, separated or divorced, and widowed), residential setting (rural, urban) and household income. Respondents were asked about household income through written statements and marking their best estimates of total household income on scales provided, including income from wages or stipends from a job as well as income from unemployment benefit, pensions, investments, aid to families or other government or non-government benefits during the previous 12 months. This variable was divided into three levels; the first was formed from the values of the first quartile, the second from the values of the second and third quartiles and the third from the values of the fourth quartile, according to the household income of the sample.

Statistical analysis

The statistical analyses took into account the stratified study design. Post-stratification corrections were made to the weights to adjust for the population distribution obtained from the national census and for non-response [24].

Descriptive analyses were conducted to characterize the study sample. These analyses included unweighted frequencies, weighted proportions, and weighted mean age and standard deviation. The factors associated with loneliness and depression separately were analyzed through bivariable logistic regression models. Odds ratio (95% CI) and p values were reported.

Several logistic regression models were fitted to test the relationship of each social network component and marital status with depression and loneliness (data not shown but available upon request). Those variables that predicted the outcome ($p < 0.20$) [25], as well as all significant

interactions with depression or loneliness ($p < 0.05$), were introduced into multivariable logistic regression models. Odds ratio (95% CI) and p values were reported in each model. Probabilities (95% CI) for loneliness and depression adjusted for remaining significant covariates were also calculated, stratifying by marital status, size of the social network and the presence of depression or loneliness, according to significant interactions in each model. Stata version SE 12 was used to analyze the survey data.

Results

The socio-demographic characteristics of the study sample are illustrated in Table 1. A total of 3535 participants aged ≥50 years was included in the analysis. Mean age was 66.5 years (SD = 10.6) and 54.1% of the sample was female. Thirteen percent of the participants reported feelings of loneliness and the prevalence of depression was 12.1% in the overall sample.

Several factors associated with higher odds for loneliness were identified in the bivariable logistic regression analyses. Being female, older, previously or never married, with a lower level of education, having medium family income, no working and being depressed were associated with a higher probability of presenting feelings of loneliness. Moreover, scores below the median in the three social network components (i.e., size, frequency and quality of the network) were related to lower odds for loneliness. All these factors were also associated with higher odds for depression apart from age and size of social network.

The multivariable analysis (Table 2) reported factors related to loneliness and depression separately. Being unmarried (never married, separated, divorced or widowed), depressed and scores above the median in size of social network were associated with lower odds for loneliness, as in the bivariable analysis. Furthermore, we also found a significant association between living in rural setting and higher odds for loneliness. Conversely, frequency of contact, quality of the network, educational level, employment status and household income were no longer associated with loneliness. The interactions between marital status and depression, and between size of social network and depression were statistically significant.

All bivariable associations remained significantly associated with depression in the multivariable analysis apart from frequency of contact and quality of network. Age was also associated with depression, with the youngest cohort having higher odds for depression. Size of social network and loneliness, and marital status and loneliness were significant interactions in this model.

Figure 1 shows estimated probabilities of loneliness in depressed vs. non-depressed people according to size of

social network for distinct marital status categories. Loneliness was related to the size of social network and marital status. However, the relationship varied with depression status: among people without depression, being married was the most relevant factor in feeling lonely; while among people with depression the most powerful correlate was having a small social network. Figure 2 shows probabilities for depression in lonely vs. non-lonely people stratified by the same factors. Among people without loneliness, higher probabilities of depression were related to having previously been married but not having a small social network, whereas being married and having a small social network was associated with the highest probability of suffering from depression among people with loneliness.

Discussion

To the best of our knowledge, this is the first study to examine, in a representative sample of the Spanish older adult population, the role of the social network and depression in the experience of loneliness; as well as the role of the social network and loneliness in the experience of depression. Significant differences in the relevance of the size of social network and marital status were found when comparing participants with and without depression, or with and without loneliness. Having a small social network impacted depression only in those people who were lonely. Further, having a small social network was associated with loneliness in particular in those who are depressed. In contrast, in non-depressed people, loneliness was more related to marital status than size of social networks. These results are generally consistent with previous studies that support an interaction between social networks, loneliness and depression. For example, social isolation [26] or depression [27] only predicted mortality in individuals who feel lonely. In summary, these results confirm our initial hypothesis that emotional and social loneliness have a distinct impact on depression.

Surprisingly, in those who do not feel lonely, a large social network was associated with a higher frequency of depression. Additionally, married individuals who feel lonely have a higher than 55% estimated probability of being depressed. Negative interactions, which have not generally been taken into account when studying social networks and mental health, may help explain these relationships [6]. In general, the findings of the present study are also consistent with the model suggested by Cacioppo et al. According to these authors, loneliness occurs in clusters, extends up to three degrees of separation in the social network, is disproportionately represented at the periphery of social networks, and spreads through a contagious process [28]. Rosenquist et al. also suggested

Table 1 Characteristics of the study sample and related factors to loneliness and depression

Characteristics	Overall ($n = 3535$) (n, %)	Loneliness		Depression	
		Odds ratio (95% CI)	p value	Odds ratio (95% CI)	p value
Gender					
Male	1595 (45.9%)	Ref		Ref	
Female	1940 (54.1%)	2.03 (1.57, 2.64)	<0.001	2.80 (2.04, 3.84)	<0.001
Age groups (mean = 66.5, SD = 10.6)					
50–65 years	1817 (49.8%)	Ref		Ref	
66–80 years	1362 (39.8%)	1.33 (1.00, 1.77)	0.049	0.94 (0.67, 1.31)	0.701
80+ years	342 (10.4%)	1.60 (1.00, 2.589)	0.052	1.02 (0.66, 1.57)	0.925
Marital status					
Married or cohabiting	2191 (61.8%)	Ref		Ref	
Never married	307 (8.6%)	4.03 (2.46, 6.61)	<0.001	1.05 (0.68, 1.63)	0.810
Previously married	1037 (29.6%)	6.07 (4.45, 8.29)	<0.001	2.32 (1.74, 3.10)	<0.001
Residential setting					
Urban	3049 (83.4%)	Ref		Ref	
Rural	486 (16.6%)	1.40 (0.96, 2.05)	0.082	1.04 (0.73, 1.49)	0.817
Level of education					
No education[a]	1145 (31.6%)	Ref		Ref	
Primary education	1067 (31.9%)	0.77 (0.55, 1.08)	0.125	0.49 (0.37, 0.66)	<0.001
Secondary education	934 (25.7%)	0.58 (0.42, 0.819)	0.001	0.49 (0.34, 0.71)	<0.001
College/University	388 (10.9%)	0.41 (0.26, 0.639)	<0.001	0.31 (0.10, 1.00)	0.050
Employment status					
Working	834 (23.8%)	Ref		Ref	
Retired/disabled	1568 (46.7%)	1.95 (1.30, 2.93)	0.001	2.69 (1.60, 4.53)	<0.001
Homemaker/unpaid work	790 (22.2%)	2.45 (1.67, 3.58)	<0.001	4.19 (2.50, 7.03)	<0.001
Unemployed	251 (7.3%)	1.71 (0.97, 3.03)	0.063	4.81 (3.01, 7.69)	<0.001
Household income					
High	769 (23.3%)	Ref		Ref	
Medium	1583 (49.1%)	2.11 (1.60, 2.77)	<0.001	2.62 (1.92, 3.57)	<0.001
Low	828 (27.6%)	1.40 (0.99, 1.989)	0.060	1.85 (1.11, 3.06)	0.018
Size of the network					
Below the median	1729 (49.6%)	Ref		Ref	
Above the median	1723 (50.4%)	0.42 (0.31, 0.56)	<0.001	0.80 (0.56, 1.13)	0.199
Frequency of contact					
Below the median	2029 (57.3%)	Ref		Ref	
Above the median	1506 (42.7%)	0.22 (0.17, 0.30)	<0.001	0.51 (0.40, 0.65)	<0.001
Quality of the network					
Below the median	1792 (50.6%)	Ref		Ref	
Above the median	1743 (49.4%)	0.21 (0.16, 0.27)	<0.001	0.46 (0.35, 0.61)	<0.001
Loneliness					
No	3062 (86.9%)	–		Ref	
Yes	473 (13.1%)	–	–	6.66 (5.00, 8.89)	<0.001
Depression					
No	3062 (87.9%)	Ref		–	–
Yes	434 (12.1%)	6.66 (4.99, 8.89)	<0.001	–	–

Unweighted frequencies (n), and weighted proportions are displayed for overall whereas odds ratio (95% CI) and p value are displayed for factors related to depression and loneliness

SD standard deviation, *CI* confidence interval, *Ref* category of reference

[a]No education includes those people who had never been to school or did not finish primary school

Table 2 Multivariable logistic regression models of the factors associated with loneliness and depression

Characteristics	Loneliness[a] OR (95% CI)	Depression[a] OR (95% CI)
Intercept	0.59 (0.03, 0.12)***	0.03 (0.01. 0.08)***
Gender		
Male	Ref	Ref
Female	0.95 (0.64, 1.40)	1.84 (1.26, 2.68)***
Age groups		
50–65 years	Ref	Ref
66–80 years	0.80 (0.55, 1.15)	0.44 (0.31, 0.64)***
80+ years	0.64 (0.36, 1.14)	0.38 (0.22, 0.66)**
Marital status		
Married or cohabiting	Ref	Ref
Never married	3.81 (1.93, 7.50)***	0.64 (0.31, 1.31)
Previously married	6.10 (3.55, 10.48)***	1.41 (0.91, 2.19)
Residential setting		
Urban	Ref	–
Rural	1.58 (1.01, 2.48)*	–
Level of education		
No education[a]	Ref	Ref
Primary education	1.01 (0.64, 1.60)	0.44 (0.31, 0.61)***
Secondary education	0.92 (0.59, 1.42)	0.56 (0.35, 0.91)*
College/University	0.80 (0.42, 1.51)	0.56 (0.19, 1.60)
Employment status		
Working	Ref	Ref
Retired/disabled	1.29 (0.80, 2.09)	3.08 (1.72, 5.49)***
Unpaid work	1.23 (0.75, 2.04)	3.28 (1.82, 5.91)***
Unemployed	1.18 (0.58, 2.40)	3.95 (2.08, 7.52)***
Household income		
High	Ref	Ref
Medium	1.22 (0.82, 1.82)	1.70 (1.08, 2.68)*
Low	0.89 (0.57, 1.39)	1.42 (0.78, 2.58)
Size of network		
Below the median	Ref	Ref
Above the median	0.59 (0.40, 0.87)**	1.57 (1.02, 2.41)*
Frequency of contact		
Below the median	Ref	Ref
Above the median	0.78 (0.45, 1.36)	0.77 (0.47, 1.24)
Quality of network		
Below the median	Ref	Ref
Above the median	0.73 (0.44, 1.22)	0.81 (0.48, 1.37)
Depression		
No	Ref	–
Yes	16.47 (9.92, 27.37)***	–
Loneliness		
No	–	Ref
Yes	–	15.96 (9.16, 27.79)***
Interactions[b]		
Marital status	(×depression)	(×loneliness)
Married or cohabiting	Ref	Ref
Never married	0.59 (0.18, 1.99)	0.58 (0.19, 1.72)
Previously married	0.29 (0.16, 0.52)***	0.32 (0.18, 0.57)***
Size of the network	(×depression)	(×loneliness)
Below the median	Ref	Ref

Table 2 (continued)

| Characteristics	Loneliness[a] OR (95% CI)	Depression[a] OR (95% CI)
Above the median	0.33 (0.16, 0.68)**	0.31 (0.15, 0.62)**

CI confidence interval, *Ref* reference category, *OR* odds ratio

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

[a]Only those covariates which were significant in the bivariable model ($p < 0.20$) were included in the multivariable model apart from age groups and gender

[b]Only the interactions which were significant in the bivariable model ($p < 0.05$) were included in the multivariable model. These interactions were marital status and size of social network with depression for loneliness as the outcome and with loneliness for depression as the outcome

Fig. 1 Estimated probability (95% CI) of loneliness by depression status, size of social network and marital status adjusted for remaining covariates
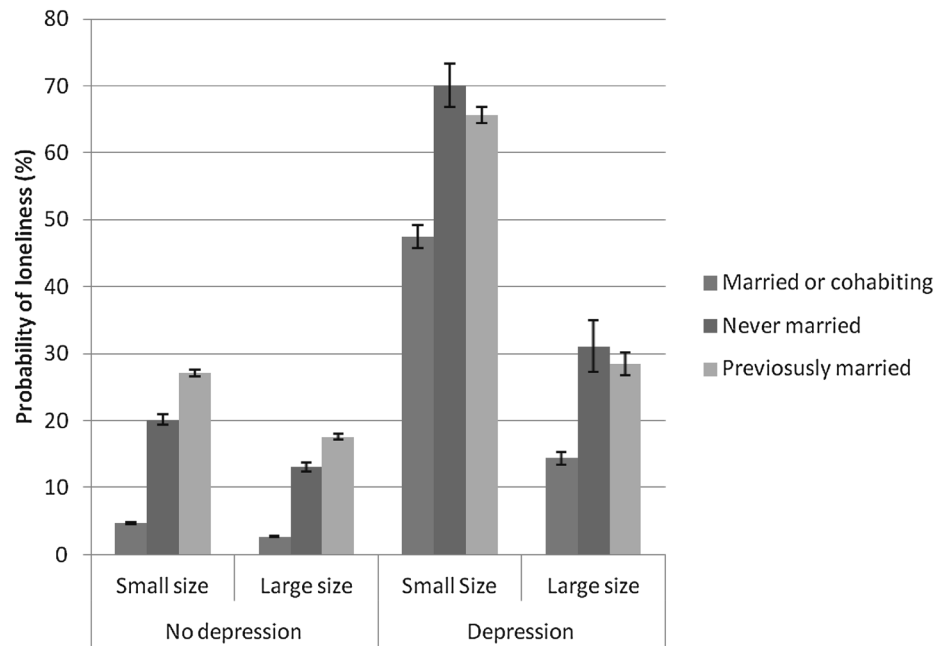
Note= Large size is above the median and small size below or equal to the median.

Fig. 2 Estimated probability (95% CI) of depression by loneliness status, size of social network and marital status adjusted for remaining covariates
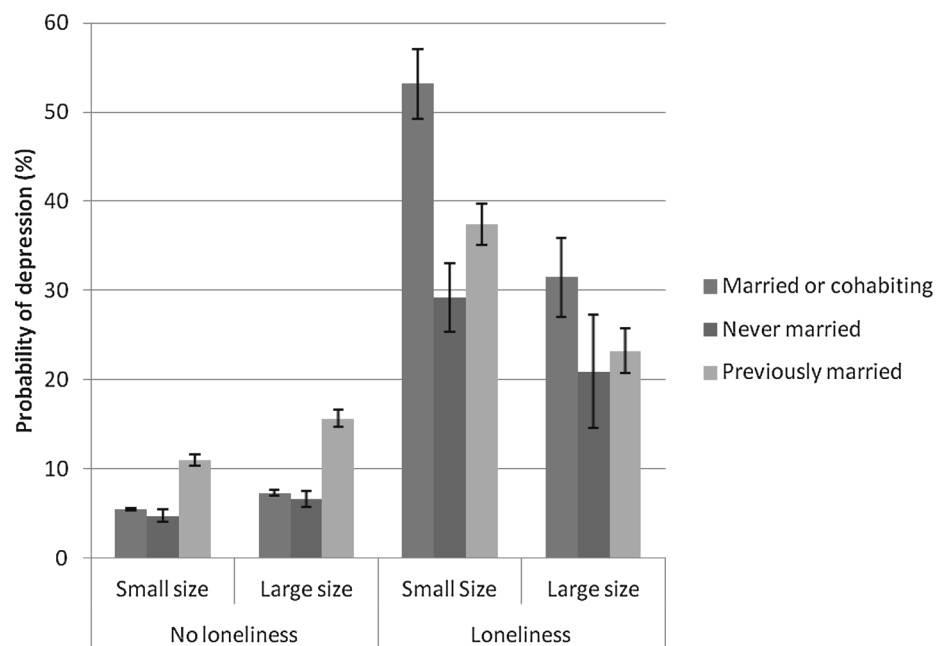
Note= Large size is above the median and small size below or equal to the median.

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that depression followed a similar process of spreading through the social network, with higher levels of depression in individuals with a smaller number of contacts [29].

In line with these models, we suggest that two types of loneliness exist depending on the position held by the individual in the social network. The first type, which would be experienced by individuals on the periphery of the social network (i.e., individuals with fewer contacts), would be more closely related to depression, which in turn has been associated with lack of social support. In individuals with central positions in the social network, i.e., those with a higher number of links, loneliness is not explained by the social network or associated with depression. In these individuals, marital status has greater influence on loneliness. The possible existence of loneliness subtypes is consistent with the need to distinguish between emotional and social loneliness to improve the effectiveness of interventions to reduce loneliness, as suggested by other researchers [30].

Qualitative studies explaining the perception of loneliness in individuals with and without depression support our hypothesis about distinct loneliness subtypes. Cohen-Mansfield et al. recommended addressing the understanding of loneliness from specific contexts [4], Van Beljouw et al. stressed the need to pay attention to feelings of loneliness in elderly people with depressive symptoms due to its high prevalence and consequences for mental health [31], Lindgren et al. detected high levels of stigma among people suffering from mental disorders and loneliness [32] while Taube et al. defined the experience of loneliness among frail, elderly people as a struggle to overcome physical limitations and psychological and social barriers [33].

The prevalence of high odds for loneliness (≥ 6 UCLA total score) was 12.1%, which is similar to that reported in a previous study [3]. However, different measurement methods complicate comparisons between studies, a fact evidenced in a study of 3008 American participants aged 50 years or more, where loneliness was measured in two ways: by a cut point of ≥ 6 in the three-item UCLA loneliness scale, and by asking whether individuals had feelings of loneliness much of the time over the previous week, a similar question to that used by Yang and Victor in their study [3]. Shiovitz-Ezra and Ayalon reported that only 45% of people who were classified as lonely by the direct question were classified in the same way by the UCLA loneliness scale, demonstrating that distinct measures of loneliness capture different characteristics of people who suffer from it [34].

The prevalence of depression in our study was 12.1%, which is much higher than the prevalence shown by a previous study on a representative sample of the population in Spain (4.0%) [35]. However, the prevalence reported in the present study is similar to that shown by some studies

with representative samples from other countries, such as a prevalence of 10.3% in the United States [36].

Apart from the social network components and loneliness or depression status, being female, 50–65 years old, previously married (separated or divorced), not working, with a lower level of education and a medium household income were associated with higher odds for depression in the overall sample, which is quite consistent with previous research [35], whereas living in a rural area and being unmarried were associated with higher odds for loneliness. Therefore, most socio-demographic factors associated with loneliness and depression in the bivariable model do not remain as significant correlates of loneliness after the association is adjusted for depression. These results highlight the need to take into account the role of depression and social networks in studies on the correlates of loneliness or protective measures against it.

Strengths and limitations of the study

The strengths of our study include the use of a large amount of community-representative data, with a sample of older adults from a variety of socio-economic backgrounds, and the ability to control for confounding factors. However, we need to consider several limitations associated with our findings. First, the cross-sectional design limited the possibility of examining causal relationships. Second, inconsistencies between the distinct techniques for measuring loneliness impede comparability between studies. Finally, it is possible that some of the findings are influenced by the cognitive distortions individuals with experience of depression [37] or other factors. For instance, some of the variables were collected retrospectively through self-report, which may result in recall or reporting bias. Nevertheless, it should be mentioned that most epidemiological studies have used self-reported data, and recall biases are usually relatively minor [38].

Conclusions

Although many studies based on addressing maladaptive social cognition showed greater effectiveness in reducing loneliness than others based on increasing social interactions and communication skills [39], the results of this study show the need to examine the role of the social network in the feelings of loneliness among older adults with depression, taking into account their social and demographic characteristics and health status. In future research in this field, in addition to the role of the social network, the quality of various kinds of social interaction needs to be taken into account. In the case of older Spanish adults with depression, the reconstruction of degraded social networks

over time seems essential and, therefore, interventions based on this could be more beneficial than others based on cognitive behavioral therapy in reducing loneliness and depression.

This study contributes to raising awareness of the need for longitudinal studies that allow the consideration of temporary associations and causality, along with qualitative studies which explore whether discourse about loneliness changes according to the health and social conditions. Despite valuable initiatives [40], we are far from implementing social policies to reduce the risk of loneliness in older adults and have an impact on the prevalence of depression, which is currently the most widespread mental disorder and one which represents a huge challenge for the international community.

Compliance with ethical standards

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3.4.-The role of socio-economic status and neighborhood social capital on loneliness among older adults: evidence from the Sant Boi Aging Study

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ORIGINAL PAPER

The role of socio-economic status and neighborhood social capital on loneliness among older adults: evidence from the Sant Boi Aging Study

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Abstract

Purpose The aim of the present study is to analyze the role of age in the association between socio-economic status (SES) and loneliness as well as the role of neighborhood social capital (NSC) in the association between individual social capital and loneliness.

Methods Data include a representative population-based sample from Sant Boi de Llobregat (a suburb of Barcelona) of 1124 adults aged 50 and over. Logistic regression models were used to analyze the survey data. Interactions between SES and age, and NSC and individual social capital were explored.

Results Among the poorest older adults, older individuals showed a lower likelihood of loneliness (OR 0.09, 95% CI 0.02, 0.30, $p < 0.05$) compared with the youngest cohort after adjusting for covariates, while among the richest individuals there were no significant differences among age cohorts. Individuals living in an area with high NSC and high individual social capital showed a lower likelihood of loneliness (OR 0.36, 95% CI 0.17, 0.73, $p < 0.05$) compared with those with low individual social capital after adjusting for covariates. The effect of individual social capital was not significant among individuals living in an area with low NSC.

Conclusion Interventions focusing on low SES middle-aged (50–59 years old) individuals and those aiming to increase NSC could be effective strategies to reduce the prevalence of loneliness in older people.

Keywords Loneliness · Neighborhood social capital · Socio-economic status

Introduction

Loneliness has been defined as a discrepancy between the actual and desired characteristics of an individual social network which causes an unpleasant feeling [1]. In a study in 25 European countries [2], the prevalence of loneliness was estimated to range from 3.2% in Denmark to 34% in Ukraine. Loneliness is thought to increase with age. Some relationships are lost as people get older (e.g., retirement, partner's death) [3–5]. In a cross-national European study, it was found that 7.4% of people aged 60 years or older in the UK, 11.4% in France and 11.5% in Spain reported feeling lonely in the previous week [2].

Perceived social isolation has traditionally been used as a proxy for loneliness [6]. However, the loneliness construct includes other factors, such as lack of a partner or affiliative environments [7]. Loneliness has also been considered as a consequence of a maladaptive social cognition. A meta-analysis of interventions to reduce loneliness [8] found that cognitive therapy aimed at redirecting distorted perceptions of social life was effective in

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alleviating loneliness, compared with interventions to increase social support and opportunities for social interaction. Conversely, the Framingham Heart Study showed that loneliness is spread through social networks, with the strongest effect seen at the periphery, highlighting the relevance of the real social network and showing that individuals with fewer social ties are at special risk of loneliness [9].

Being divorced or widowed [10], having a small social network or poor social relationships [11], a greater number of chronic medical conditions and lower quality of life [12] have been associated with loneliness. Cacioppo et al. also showed that loneliness and depressive symptomatology act in a synergistic way to diminish well-being in middle and older-aged adults [13].

The association between socio-economic status (SES) and loneliness is still unclear and a mixture of results have been obtained [14, 15]. However, the hypothesis that loneliness spreads through social networks [9] suggests that loneliness has a close relationship with social exclusion and, therefore, the most vulnerable people in society, such as the poorest and oldest individuals, could be those most affected by loneliness [16]. According to this hypothesis, the oldest adults would be at higher risk of loneliness. This is in line with previous studies [17], although this association could be modified by SES.

Furthermore, neighborhood social capital (NSC) could have an impact on loneliness. According to Coleman, social capital is a public good, benefiting all those who are part of a structure and is a potential asset for the under-privileged [18]. As reported by Nyqvist et al., there is an association between living in an area with high levels of NSC and lower levels of loneliness [19]. Previous studies distinguished between contextual social capital defined as part of a structure (i.e., NSC) and individual social capital defined as an individual characteristic measured through social capital indicators (i.e., reciprocity and trust in neighbors and civic participation). Lower levels of individual social capital have been associated with further deterioration in health, especially in areas with high levels of NSC [20] and it is not clear whether NSC, combined with high ISC, has the same effect on loneliness as it has on health.

The aim of the present study is to analyze the role of socio-economic status (SES) in the association between age and loneliness as well as the role of NSC in the association between individual social capital and loneliness in a community-based sample of people aged 50 and over from Sant Boi de Llobregat, a suburban municipality of Barcelona with about eighty thousand inhabitants.

Methods

Study design

The Sant Boi Aging Study is a cross-sectional household survey conducted in a representative sample of the non-institutionalized population aged 50 years and over in Sant Boi de Llobregat, a suburban population of Barcelona with 83,107 inhabitants. Simple random sampling was carried out in the population 50+ years from municipality census data, with an oversampling of those ≥80 years, which was 10% in the real population and 20% in the sample. The final sample included 1124 individuals. The main reasons for survey non-response were decline to participate (57%) and inability to locate the household or individual respondent (26%). Overall response rate was 52.8%.

Interviewer-administered questionnaires were conducted through Computer-Assisted Personal Interviewing (CAPI) at respondents' homes between October, 2014 and October, 2015 using COURAGE-derived methodology [21]. The survey protocol was translated from English into Spanish according to WHO translation guidelines for assessment instruments [22]. Lay interviewers were trained on the survey before administration. Quality assurance strategies were implemented during fieldwork [23].

At the beginning of the interview, the Mini Mental State Examination (MMSE) questionnaire [24] was used to assess the global cognitive functioning of the selected individual. This test is primarily used to detect and assess the progression of cognitive impairment associated with neurodegenerative diseases such as Alzheimer's disease. CAPI included a computerized algorithm based on a cut-off point (≥15 on a scale from 0 to 30) which was automatically calculated during the interview. This allowed the interviewer to determine whether the selected participant had cognitive problems which could compromise the validity of interview responses. To increase the sensitivity of the study, we chose an intermediate cut-off point within the range previously recommended by other researchers [25] to detect possible mild or moderate cases of dementia. In the event that the cut-off point was reached, a proxy interview was conducted with the participant's relative. Proxy interviews were much shorter and included questions on socio-demographics and the general state of health of the selected individual but did not include self-reported information on issues such as loneliness or social networks. Therefore, these interviews (n = 49) were excluded from the present analysis. Data obtained from those who did not answer the questions about SES (n = 104) were also not included in the analyses. Thus, the final analytical sample consisted of 971 participants. Differences between included and excluded participants (i.e., proxy interviews or

with missing values in the outcomes) were tested by Chi-squared tests. We found that respondents who underwent a proxy interview were more likely to be female and older than non-proxy respondents. Comparison between participants included in the analysis and those excluded due to missing values showed that there were no significant differences in terms of age, gender, educational level, chronic medical conditions, depression and loneliness status.

Ethics statement

Ethical approval was provided by Parc Sanitari Sant Joan de Déu, Barcelona, Spain. Written informed consent was obtained from the participants.

Measurements

Socio-demographic variables

Participants were asked for socio-demographic information: age (in years) which was categorized into three age groups (50–59 years, 60–69 years and more than 70 years), gender and marital status (married or cohabiting, never married and previously married, with the final category including separated or divorced and widowed).

Biomedical variables

Chronic medical conditions were based on self-report diagnoses of chronic obstructive lung disease, asthma, cancer, hypertension, arthritis, stroke, angina pectoris and diabetes in the previous 12 months. Additionally, symptom algorithms were used to detect non-diagnosed cases of arthritis, stroke, angina, chronic lung disease, and asthma [26]. The presence of hypertension was based on self-report diagnosis or presence of systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 0 mmHg measured at the time of the interview [27, 28]. Participants were considered to have a chronic medical condition if there was presence of either a diagnosed or non-diagnosed condition. Chronic medical conditions were categorized according to number of chronic conditions: none, one, two, or more than two.

An adapted version of the Composite International Diagnostic Interview (CIDI 3.0) was used to assess the presence of depression in the previous 12 months [29]. An algorithm based on the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders was used [30].

Loneliness

Loneliness was assessed by means of the three-item UCLA Loneliness Scale [31], which consists of the following items: "How often do you feel that you lack

companionship?"; "How often do you feel left out?"; and "How often do you feel isolated from others?". Each item was answered on a three-point scale (1 = hardly ever; 2 = some of the time; 3 = often). The scores for each item were added up to produce a loneliness scale from 3 to 9, with higher scores indicating a higher degree of loneliness. Previous research indicates that this scale has a satisfactory degree of reliability and has both concurrent and discriminant validity [31]. A cutoff of ≥ 6 was established in accordance with other studies [32].

Social isolation

Following a previous study [32], a social isolation index was created, ranging from 0 to 4. Respondents were given a point if they had less than monthly contact with children, other immediate family and friends (each scored as 1) and if they did not participate in any organizations, religious groups, or committees more than twice per year (scored as 1). Being unmarried was not considered, as this was directly related to one of the covariates (marital status). The social isolation index was categorized as: Low (0), Medium (1) or high (2–4).

Socio-economic variables

SES was computed using the total number of years of education (0–22) and the quintiles of household income level (1–5) [33]. The inclusion of education and income simultaneously in the same model may lead to collinearity. Therefore, a composite score was generated. The two variables were multiplied to create scores from 0 to 55 and summed to obtain combined scores ranging from 0 to 110, which were categorized as low, medium and high SES using tertiles as cut-off points. Occupation-based measures were not used to calculate SES levels because they might not be applicable to people who are currently unemployed and may have different meanings for different birth cohorts [34].

We assessed individual social capital through three indicators: residents' perceptions of reciprocity, trust and civic participation [35]. Perceptions of reciprocity were defined as finding "easy/very easy" to "get practical help from neighbors". People were asked whether "people in this neighborhood can be trusted?". Those responding "to a very great extent"/"to a great extent" to this question were considered to have a positive perception of trust. Civic participation was defined as participating in meetings with community leaders or in activities to improve the neighborhood more than twice per year.

For the present analyses, Sant Boi de Llobregat was divided into two areas with high and low NSC. The area with low NSC, which included the historical center and the area around the center, was built before 1965. In contrast,

Table 1 Characteristics of the overall study sample and of individuals presenting loneliness

Characteristics	Overall $n = 971$	Loneliness $n = 100$ (10.3)	p value[a]
Sex			
Male, n (%)	457 (46.3)	33 (7.2)	0.003
Female, n (%)	514 (53.7)	67 (12.8)	
Age, mean (SD) = 66.1 (9.9)			
50–59 years, n (%)	279 (30.8)	32 (12.0)	0.460
60–69 years, n (%)	325 (35.8)	28 (8.4)	
70+ years, n (%)	367 (33.4)	40 (10.4)	
Marital status			
Married or cohabiting, n (%)	680 (71.0)	43 (6.5)	<0.001
Never married, n (%)	61 (6.4)	5 (8.1)	
Previously married, n (%)	230 (22.6)	52 (22.4)	
Chronic conditions			
None, n (%)	134 (14.1)	8 (5.7)	<0.001
One, n (%)	292 (30.9)	23 (7.6)	
Two, n (%)	267 (27.8)	22 (7.4)	
More than two, n (%)	275 (27.2)	46 (18.0)	
Social isolation			
Low, n (%)	445 (45.5)	31 (7.0)	0.003
Medium, n (%)	436 (45.1)	54 (11.7)	
High, n (%)	90 (9.4)	15 (18.3)	
Depression			
No, n (%)	934 (96.1)	89 (9.4)	<0.001
Yes, n (%)	37 (3.9)	11 (30.1)	
Socioeconomic status			
Low, n (%)	298 (30.0)	44 (15.0)	0.003
Medium, n (%)	352 (35.8)	35 (9.6)	
High, n (%)	321 (34.2)	21 (6.6)	
Neighborhood social capital[b]			
High, n (%)	554 (61.1)	55 (9.8)	0.661
Low, n (%)	417 (38.9)	45 (10.7)	
Social capital indicators[b]			
Reciprocity			
No, n (%)	288 (29.0)	43 (15.6)	0.002
Yes, n (%)	683 (71.0)	57 (8.0)	
Trust			
No, n (%)	895 (92.3)	94 (10.4)	0.473
Yes $(n$ (%)	76 (7.7)	6 (8.0)	
Civic participation			
No, n (%)	917 (93.8)	98 (10.6)	0.101
Yes, n (%)	54 (6.2)	2 (3.5)	

Unweighted frequencies (n), and weighted proportions or weighted means and SD are displayed

n frequency, SD standard deviation

[a] The difference in proportions among categories was tested by Chi-squared tests

[b] Neighborhood social capital refers to living in an area with low or high social capital, whereas social capital indicators refer to individual characteristics

the area with high NSC was built after 1965, when mass migration from rural regions of Spain to the industrial zones of Barcelona made it necessary to increase the housing supply in the metropolitan area [36]. This area has more active neighborhood associations and part of the social life is also managed by recreational organizations and cultural associations set up by internal migrants [37]. We verified that the high social capital area showed

Table 2 Logistic regression analysis of factors associated with loneliness

Characteristics	Unadjusted	Adjusted
Sex		
Male	Ref.	Ref.
Female	0.64 (1.18, 1.09)**	0.30 (−0.25, 0.84)
Age		
50–59 years	Ref.	Ref.
60–69 years	−0.40 (−0.95, 0.14)	−1.66 (−2.94, −0.39)*
70+ years	−0.17 (−0.68, 0.35)	−2.20 (−3.41, −0.99)***
Marital status		
Married or cohabiting	Ref.	Ref.
Never married	0.23 (−0.74, 1.21)	0.10 (−1.09, 1.29)
Previously married	1.43 (0.97, 1.88)***	1.52 (0.96, 2.08)***
Chronic conditions		
None	Ref.	Ref.
One	0.31 (−0.54, 1.15)	0.25 (−0.68, 1.19)
Two	0.28 (−0.58, 1.14)	0.13 (−0.82, 1.07)
More than two	1.29 (0.49, 2.09)**	1.09 (0.17, 2.01)*
Social isolation		
High	Ref.	Ref.
Medium	0.57 (0.10, 1.05)*	0.40 (−0.12, 0.92)
Low	1.10 (0.41, 1.78)**	0.80 (0.03, 1.58)*
Depression		
No	Ref.	Ref.
Yes	1.43 (0.66, 2.20)***	0.96 (0.01, 1.91)*
Socioeconomic status (SES)		
Low	Ref.	Ref.
Medium	−0.51 (−1.01, −0.01)*	−1.19 (−2.47, 0.09)
High	−0.91 (−1.48, −0.35)**	−2.47 (3.76, −1.19)***
Neighborhood social capital (NSC)[a]		
High	Ref.	Ref.
Low	0.10 (−0.33, 0.53)	−0.42 (−1.23, 0.40)
Social capital indicators[a]		
Civic participation		
No	Ref.	–
Yes	−0.20 (−1.17, 0.77)	–
Trust		
No	Ref.	–
Yes	0.32 (−0.43, 1.06)	–
Reciprocity		
No	Ref.	Ref.
Yes	−0.76 (−1.20, −0.32)**	−0.97 (−1.63, −0.30)**
Interaction: age group × SES		
50–59 years × low SES	–	Ref.
60–69 years × medium SES	–	0.09 (−1.57, 1.75)
60–69 years × high SES	–	2.04 (0.34, 3.73)*
70+ years × medium SES	–	1.17 (−0.36, 2.70)
70+ years × high SES	–	1.95 (−0.08, 3.97)

Table 2 continued

Characteristics	Unadjusted	Adjusted
Interaction: reciprocity × NSC		
No × high NSC	–	Ref.
Yes × low NSC	–	1.06 (0.04, 2.07)*

Beta coefficient and 95% confidence interval are displayed

Ref category of reference

* *p* < 0.05, ** *p* < 0.01, *** *p* < 0.001

[a] Neighborhood social capital refers to living in an area with low or high social capital, whereas social capital indicators refer to individual characteristics

significantly higher percentages of the population fulfilling all social capital indicators (data not shown but available upon request).

Statistical analysis

Data were weighted taking into account post-stratification corrections to adjust for the population distribution obtained from the 2014 Sant Boi de Llobregat census to compensate for survey non-response and ensure the representativeness of the sample. Descriptive analyses included weighted proportions and unweighted frequencies. The proportion of loneliness was compared in several socio-demographic variables using the Rao-Scott Chi-squared tests.

Univariate logistic regression models were fitted to evaluate the socio-economic and socio-demographic factors related to loneliness (dependent variable). Those factors which were significantly associated with loneliness in the unadjusted models were added to the adjusted model. To verify whether SES had an impact on the relationship between age and loneliness, and whether NSC had an impact on the association between individual social capital and loneliness, the following interactions were tested in separate models: SES × age, NSC × reciprocity, NSC × trust and NSC × participation. Only SES × age ($p = 0.023$), and NSC × reciprocity were significant ($p = 0.041$), and thus were included in the final adjusted model. Results from regression models were presented as Beta coefficient and 95% confidence intervals (95% CI).

To clarify the interaction effect, estimated probabilities of loneliness were calculated based on the adjusted regression model. To estimate these probabilities, adjusted variables were centered, taking the real proportion in the sample into account. The probabilities of loneliness associated with NSC × reciprocity and those associated with SES × age are shown in Figs. 1, 2, respectively. Adjusted logistic regression models were also run stratified by SES and by NSC, obtaining odds ratios for loneliness with 95% CI which are shown as footnotes to Figs. 1, 2, respectively.

All reported *p* values were based on two-sided test, where the level of statistical significance was set at $p < 0.05$. Stata (version SE 12) was used to analyze the survey data.

Results

The socio-demographic characteristics of the study sample are presented in Table 1. Mean age was 66.1 years (SD 9.9) and 53.7% of the sample was female. About one in ten participants reported feelings of loneliness. Statistically significant differences in loneliness according to individuals' characteristics were detected. Lonely individuals were more frequently women, previously married, did not fulfil the reciprocity with neighbors indicator, had higher levels of social isolation, suffered from two or more chronic conditions and had a episode of major depression in the previous 12 months.

Table 2 shows the unadjusted models and the final adjusted model including the two significant interactions (SES × age and NCS × reciprocity). In the univariate regression models, being female, previously married, having more than two chronic conditions, depression, and presenting social isolation were significantly related to loneliness, whereas medium and high, compared with low SES, and presenting reciprocity were associated with low loneliness.

The estimated probabilities of loneliness by age cohort (i.e., 50–59 years, 60–69 years, and more than 69 years) stratified by low, medium and high SES are shown in Fig. 1. The graph shows that the youngest cohort (i.e., 50–59 years old) differed markedly from the other two; people with low SES have the highest probability of reporting loneliness (0.37) compared with people with medium (0.15) and high SES (0.5). These differences seem to disappear as people get older. These results are also supported by the ORs. According to our results and in contrast to our expectations, getting older buffers the negative effect of SES on loneliness. Having low SES is significantly associated with a higher risk of loneliness, although only among the youngest cohort (i.e., 50–59).
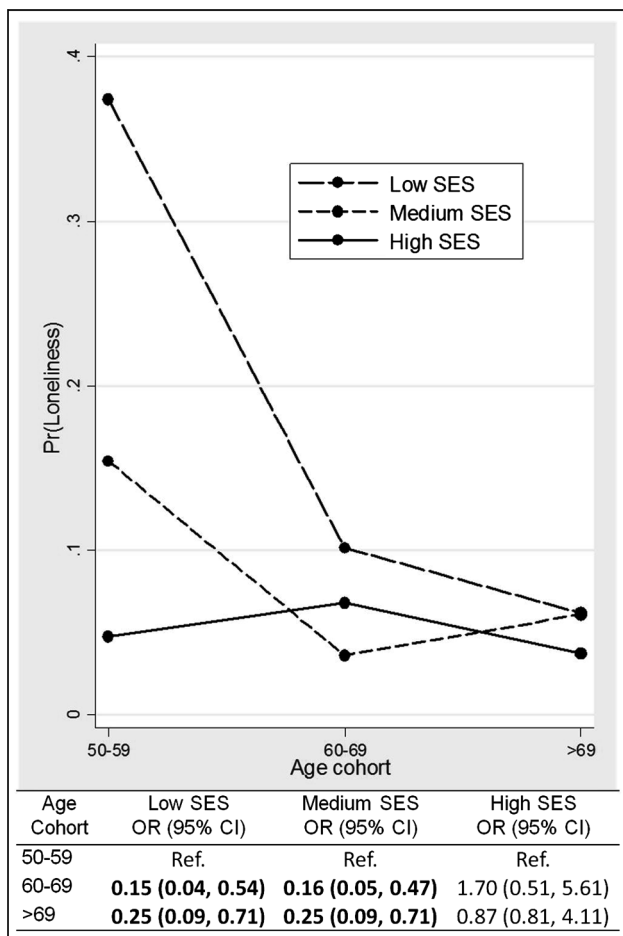
Fig. 1 Estimated probability of loneliness by SES status and age cohorts. *Note* estimated probabilities were calculated adjusted for covariates and interactions at mean from Table 2 model. Adjusted logistic regression models were also carried out by SES obtaining odds ratios (OR) for loneliness with 95% Confidence Interval (95% CI). In *bold*, significant odds ratio. *SES* socioeconomic status, *Ref* category of reference
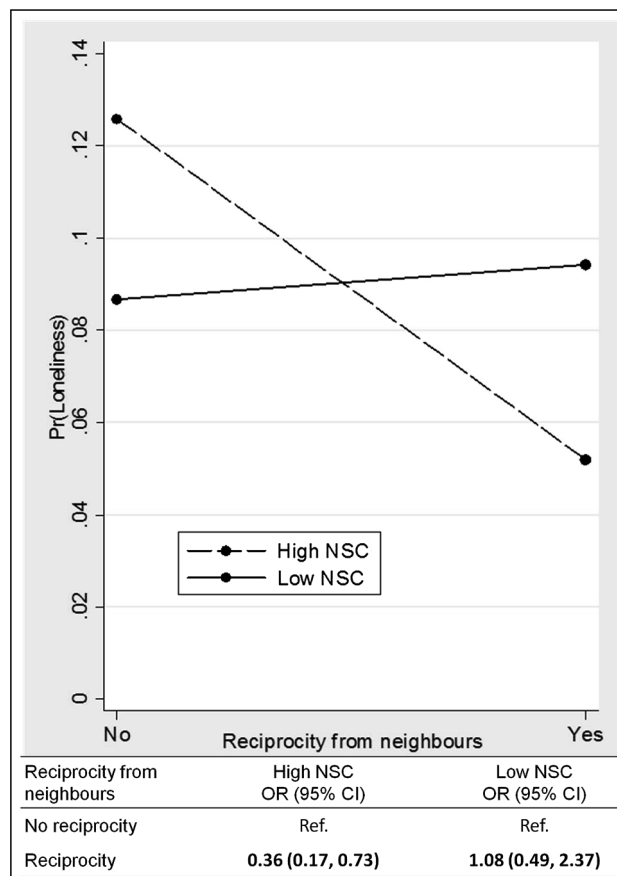

Fig. 2 Estimated probability of loneliness according to neighborhood social capital and reciprocity from neighbors. *Note* estimated probabilities were calculated adjusted for covariates and interactions at mean from Table 2 model. Adjusted logistic regression models were also run for NSC, obtaining odds ratios (OR) for loneliness with 95% Confidence Interval (95% CI). In *bold*, significant odds ratio. *NSC* neighborhood social capital, *Ref* category of reference

Figure 2 shows the estimated probabilities of loneliness, according to whether the reciprocity with neighbors indicator was met or not, stratified by high and low NSC. The effect of low NSC on the probability of loneliness does not seem to be affected by the level of reciprocity from neighbors. However, participants living in a high NSC neighborhood are significantly less likely to report loneliness if they also report reciprocity from neighbors (OR 0.36, 95% CI 0.17, 0.73, $p < 0.05$).

Discussion

To the best of our knowledge, this is the first study to analyze the relationship between age and loneliness taking the role of SES into account as well as the relationship

between individual social capital and loneliness when NSC is considered. We found that there is a detrimental effect of low SES on loneliness which is only relevant among those individuals aged from 50 to 59 years. Furthermore, individual social capital in terms of reciprocity from neighbors only had a significant buffering effect on loneliness in the area with high NSC.

The prevalence of loneliness among older adults of Sant Boi de Llobregat was 10.2%, which is relatively consistent with another study of the Spanish population aged 50 and over that showed a prevalence of 13.1% [38]. These figures represent an intermediate level of loneliness compared with other European countries [2]. Those European regions with a higher percentage of people at risk of poverty after social transfer [39] seem to have the highest levels of loneliness [2]. To test this hypothesis, we conducted a bivariate regression model with the percentage of older adults with frequent loneliness and the percentage of people at risk of poverty after social transfer [39] in 23

European Union countries [2], obtaining $\beta = 0.59$ (CI 95% 0.02, 1.15, $p < 0.05$) (data not shown). Therefore, it seems plausible that the differences observed between countries in terms of loneliness are explained by distinct economic scenarios, among other factors. This hypothesis should be tested in future research.

Following consideration of several studies, we hypothesized that loneliness would be higher among the oldest adults [17]. In the univariate logistic regression models, we found that age was not significantly related to loneliness, contrary to what other cross-sectional studies suggested [40]. It has been speculated that being older is associated with some of the leading risk factors for loneliness, for instance being widowed, and with risk factors for low life satisfaction, such as poor physical condition. However, aging is also related to other factors associated with well-being such as a greater degree of self-acceptance [41], which might explain why the oldest people do not report high levels of loneliness, compared with middle-age people. Most importantly, in the multivariate logistic regression model for loneliness, the interaction between age and SES was significant. This would indicate that the relationship between aging and loneliness depends on SES. Low SES levels were significantly associated with loneliness only among middle-aged adults (50–59 years old), whereas being older (60–69 and 70+) was protective against the deleterious effect of low SES on loneliness. These age cohort differences for the effect of SES on loneliness could also be explained by survival bias. Those with low SES and high loneliness might be more likely to die [42] or present severe health problems such as dementia [43] and, therefore, not be included in the oldest cohorts.

According to our results, the common origin of most inhabitants in the areas with high NSC, established in 1965 and occupied by migrants from rural areas of Spain employed mainly as industrial workers, could have facilitated social organization and identification within the neighborhoods. Having neighbors with similar SES and common origin, social engagement and sense of community are factors related to higher NSC [44]. Furthermore, when networks of social capital have been built, newcomers have a need to become part of them, which could explain the permanence of social capital over years [45]. However, it is possible that social cohesion within neighborhoods weakens among younger participants. This might explain the differences found between the youngest and the oldest cohorts in the effect of SES on loneliness. The mass migration from Spanish rural areas to industrialized regions such as Sant Boi de Llobregat mainly occurred during the 60's and 70's. Thus, individuals aged 60 and older are the majority in that collective, whereas people in the youngest cohort (i.e., 50–59) could have different origins. Therefore, the reason why getting older seems to buffer the negative

effect of SES on loneliness is unclear, although it could be related to higher levels of self-acceptance among older people, as indicated by previous literature [41]. Cohort or survival bias could also explain these results although longitudinal studies would be needed to test these hypotheses and future research should analyse whether differences in loneliness according to SES are maintained over time in the youngest cohort.

Our findings on the effects on loneliness of living in an area with higher or lower NSC are consistent with the view of social capital as an attribute of groups and communities according to which "features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit" [46] since only those living in the high NSC area benefit from their predisposition to establish networks of reciprocity with their neighbors. According to the results of the present study, in areas with high NSC, individuals outside the reciprocity network have far greater difficulty building alternative relationships and, therefore, show a greater probability of loneliness, which is relatively consistent with the results of other studies on social capital and health [20]. On the other hand, in areas with low NSC, there may no significant difference between being in or out of these networks, as social life may not depend on relationships with neighbors. These results may help to explain how the beneficial effects of individual social capital on health are stronger in vulnerable neighborhoods [47], the inhabitants of which would be more likely to establish reciprocity networks with neighbors due to the absence of other resources.

Although interventions for promoting social capital to reduce loneliness had previously been tested in Spain with significant results [48], there are doubts among the architects of the social capital concept regarding the possibility of building social capital in places where it is lacking. According to Putnam, "where institution building (and not mere constitution writing) is concerned, time is measured in decades" [49]. Therefore, a feasible measure could be to preserve social capital by respecting the autonomy of the community and facilitating its development.

Strengths and limitations of the study

The strengths of our study include the use of community-representative data, with a sample of older adults from a variety of socio-economic backgrounds, and the ability to control for confounding factors. However, several limitations should be kept in mind. First, the cross-sectional design limited the possibility of examining causal relationships. Second, as previously mentioned, possible cohort or survival biases could explain the significantly higher prevalence of loneliness among younger and poorer individuals. Future longitudinal studies should further

clarify these findings. Third, SES information was missing in about one tenth of participants. Results may have been different if these people had been included in the analysis. However, we did not find significant differences between those included or excluded, as has been previously noted. Fourth, Sant Boi de Llobregat is a large town and reducing it to two large areas can lead to bias due to the socio-demographic and socio-economic differences that exist within each of the areas. Nevertheless, the division used has been justified and the attributes associated with each area have been contrasted with data. Finally, some of the variables were collected retrospectively through self-report, which may result in recall or reporting bias. However, recall biases are usually relatively minor in epidemiological studies [50].

Conclusions

The results of this study suggest that the level of loneliness among older adults depends on age and socio-economic status, with the middle-aged and economically disadvantaged the most vulnerable. However, these differences could be due to cohort differences in social cohesion. Our findings also show that individuals living in a neighborhood with high social capital who are outside this social capital are at higher risk of suffering from loneliness. Global interventions which are focused on improving the social conditions of the poorest middle-aged individuals as well as facilitating the increase of both NSC and individual social capital could be an effective strategy to reduce the prevalence of loneliness, while helping to promote healthy aging. There is a need for policies designed to create or preserve NSC, especially in low socio-economic areas.

Compliance with ethical standards

Conflict of interest The authors declare that they have no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Capítol 4

DISCUSSIÓ

4.1.-Estatus socioeconòmic i depressió.

Els factors psicosocials, i la solitud en particular (OR=4,45 IC 95%=3,66-5,42), van ser les variables que van mostrar una relació directa més robusta amb la possibilitat de patir depressió major en el darrer any (TDM). Tanmateix, els factors materials i, particularment, les dificultats financeres són aquells sobre els que recau un percentatge més elevat de les relacions entre els indicadors d'estatus socioeconòmic i TDM (el percentatge mediat pels factors materials va ser d'un 46.6% per a ingressos, 28.6% per a educació i 52.0% per a ocupació). Altres factors que van intervenir significativament en la relació van ser els factors conductuals (8,1%), en el cas de l'educació, i els factors psicosocials (27.1%), en el cas de l'ocupació.

Segons els resultats del nostre estudi, els factors materials com ara les tensions financeres, l'accés a l'assistència mèdica privada i la situació laboral són el conjunt de factors en els que, en actuar com a mediadors, recau una major part de la relació entre estatus socioeconòmic i depressió en comparació amb la proporció en què intervenen factors psicosocials o conductuals. L'efecte particularment robust dels problemes financers, que persisteix com a significativament relacionat amb la depressió després d'ajustar la relació pels indicadors sociodemogràfics i d'estatus socioeconòmic, podria ser una conseqüència de la seva independència conceptual respecte la quantitat d'ingressos, ja que l'existència de problemes financers també depèn de la capacitat de viure d'acord amb les possibilitats que ofereixen els recursos disponibles (Aneshensel, 2009). En aquesta línia, un estudi transversal amb una mostra representativa d'adults nord-americans va mostrar que, independentment del nivell d'ingressos, el proveïment adequat de serveis destinats a ajudar a administrar l'economia d'aquelles persones que ho necessiten podria reduir la prevalença de trastorns mentals (Zurlo et al., 2014).

En referència a la situació laboral, l'estar retirat també és manté com a significativament relacionat amb la incidència de depressió en el model ajustat. Per tant, l'efecte del retir sobre la salut mental de les persones grans no s'explica exclusivament pel seu efecte sobre els recursos materials disponibles, sinó que el retir pot ser, a més, un esdeveniment de transició amb un clar efecte sobre les relacions

socials dels individus. En aquest sentit, estudis previs van demostrar que la salut mental de les persones grans depèn més d'esdeveniments de transició que no pas d'altres factors amb més estabilitat durant gran part del curs de la vida, com són els indicadors d'estatus socioeconòmic (Kennedy et al., 1990). Els partidaris de la hipòtesi de la supervivència justifiquen aquests resultats proposant que quan les persones envelleixen i sobreviuen a l'exposició de factors de risc a llarg termini sense sucumbir a la depressió, disminueix la probabilitat d'una incidència associada a aquestes dificultats (Bruce, 2002).

A diferència del retir, l'atur no es manté com a significativament associat a la probabilitat de patir depressió en el model ajustat, la qual cosa suggereix que el seu efecte sobre la depressió es dona, principalment, com una conseqüència de l'estatus socioeconòmic. En aquest sentit, la relació que es proposa és que les persones de baix estatuts socioeconòmic tenen més possibilitats d'estar a l'atur, una situació que provoca emocions negatives com ara el descens de l'autoestima, que afavoreix la incidència de depressió (Álvaro et al., 2019). Tanmateix, també hi ha investigadors que proposen aquest procés de forma inversa, en considerar que l'atur té un efecte sobre els recursos materials disponibles (Bijlsma et al., 2017). Per altra banda, també existeixen diferències sobre si els efectes de l'atur sobre la depressió afecta a ambdós sexes (Zuelke et al., 2018) o tan sols als homes (Bijlsma et al., 2017), suggerint la importància del rols de gènere en la relació entre atur i depressió. Altres autors han destacat que característiques com la durada o el nivell socioeconòmic de la persona aturada són factors rellevants que condicionen la fortalesa de la relació entre atur i depressió (Latsou i Geitona, 2018). Malgrat els diferents matisos, aquesta relació compta amb una àmplia evidència i ha estat acuradament quantificada en diferents països occidentals: la pèrdua d'ocupació entre els habitants de 50 a 64 anys s'ha associat a un augment del 28% dels símptomes depressius als Estats Units i del 8% a Europa (Riumallo-Herl et al., 2014).

De la mateixa manera que ocorre amb l'atur, els efectes de l'accés a la sanitat privada com a factor protector de la depressió no persisteixen després d'ajustar la relació per l'estatus socioeconòmic. Per tant, l'efecte protector de l'assegurança privada sobre la depressió contribueix a augmentar les desigualtats socioeconòmiques en depressió i no existeix cap altre efecte a tenir en compte. Aquesta desigualtat

podria veure's agreujada per la limitació de la cobertura sanitària pública com a conseqüència de les polítiques d'austeritat. En aquest sentit, existeixen clares evidències respecte al sentit regressiu de l'austeritat i la seva particular incidència en els grups més vulnerables i en les regions més desfavorides (Stuckler et al., 2017).

Més enllà dels factors materials, conductes de risc com ara el tabaquisme, el sedentarisme o l'obesitat, i factors psicosocials com és el cas de la soledat, l'aïllament social objectiu o l'estat civil, també han estat identificats com a factors mediadors de l'associació entre estatus socioeconòmic i depressió. Aquesta mediació depèn de l'indicador socioeconòmic pres en consideració: si bé els factors materials són els únics mediadors en l'associació entre ingressos de la llar i depressió, en el cas de l'educació la relació és també atribuïble a factors conductuals i, en el cas de l'ocupació, a factors psicosocials.

En línia amb els resultats del present estudi, diversos investigadors han identificat efectes mediadors de diferents factors conductuals en la relació entre estatus socioeconòmic i depressió. Aquests investigadors han argumentant que un baix nivell educatiu pot comportar una menor informació sobre comportaments de risc com ara el tabaquisme, el sedentarisme i l'obesitat (Adler i Newman, 2002; van Lenthe et al., 2004). La relació entre tabaquisme i depressió ha estat identificada com a robustament significativa en ambdós sentits i, a més, fortament relacionada amb l'alcoholisme (An i Xiang, 2015). En referència al sedentarisme, els efectes protectors de l'activitat física sobre la incidència de depressió en persones grans són àmpliament reconeguts. Existeixen recomanacions específiques sobre la quantitat òptima d'exercici: les persones majors de 65 anys haurien de fer almenys 150 minuts d'activitat física aeròbica d'intensitat moderada -o 75 minuts d'intensa- cada setmana. L'activitat aeròbica s'ha de realitzar en episodis de durada mínima de 10 minuts i existeix una gradació depenent del nivell de mobilitat de les persones grans (McDowell et al., 2018; World Health Organization, 2010). Finalment, la relació entre obesitat i depressió ha estat detectada en ambdues direccions i explicada a través de mecanismes biomèdics com ara els factors hereditaris (Milaneschi et al., 2019) i mecanismes psicosocials com ara l'estigma que pateixen les persones grasses en les societats occidentals amb un clar efecte negatiu sobre el seu benestar emocional (Hunger i Major, 2015). A més, l'obesitat sembla tenir una particular relació amb altres factors de risc com ara viure en un entorn urbà, la vellesa, el sexe femení, una

mala nutrició, el sedentarisme o un elevat consum d'alcohol; a més, les persones grasses amb aquests factors de risc addicionals presenten un 32% més de probabilitats de patir depressió que les persones no grasses (Pereira-Miranda et al., 2017). Per altra banda, alguns autors han proposat que un context socioeconòmic positiu actuaria de moderador de la relació entre obesitat i salut mental en països europeus (Alvarez-Galvez i Gomez-Baya, 2017).

És possible que l'efecte de l'ocupació sobre la depressió a través de factors psicosocials no s'expliqui exclusivament pel nivell d'ocupació. Determinades característiques específiques de cada lloc de treball, com ara unes baixes possibilitats de promoció, l'obligació de dissimular les emocions, una forta demanda amb baixa recompensa, l'alienació, la inseguretat, la discriminació o la intimidació per part dels superiors i, especialment, uns dèbils sentiments de comunitat entre els treballadors, estan relacionades de forma consistent amb el benestar, independentment del tipus de treball (Schütte et al., 2014). Val a dir que algunes ocupacions específiques, com ara la conducció de camions o els servei de neteja o de seguretat, acostumen a presentar amb més freqüència gran part d'aquestes característiques i, per tant, han estat significativament associades a la depressió (Fan et al., 2012). Compartint aquesta línia argumental, una revisió sistemàtica ha mostrat una quantitat significativa d'investigacions assenyalant que l'ocupació precària i el treball informal tenen unes conseqüències conductuals i psicosocials que comporten problemes de salut física i mental (Muntaner et al., 2010). Per tant, si bé la relació entre nivell d'ocupació i depressió és principalment atribuïble a la desigualtat d'ingressos o al nivell educatiu (segon les nostres dades en un 70%), les condicions laborals a través de les quals es desenvolupa cada ocupació a nivell específic podrien estar relacionades amb la probabilitat de patir depressió de forma independent a la resta d'indicadors socioeconòmics.

Els factors psicosocials i, particularment, la soledat estaven fortament associats a la depressió, però el seu rol com a mediadors ha estat mínim. Estat civil, soledat i depressió s'han mantingut com a significativament relacionats amb la depressió en el model ajustat, i els coeficients de les associacions han mostrat una robustesa que tan sols ha estat lleugerament inferior. Aquests resultats són coherents amb les aportacions d'altres investigadors que es van referir a l'associació temporal

entre soledat i depressió com a no atribuïble a factors socioeconòmics o sociodemogràfics. Segons aquests investigadors, aspectes que descriuen la situació relacional objectiva dels individus, com ara l'estat civil o el nombre d'interaccions socials, factors de tipus subjectiu com ara el suport social percebut o la soledat, i factors socioeconòmics, mantenen un efecte independent en la probabilitat de patir depressió entre les persones grans (Cacioppo et al., 2010); la qual cosa dona una idea de la complexitat dels condicionaments socials de la salut mental i de la necessitat d'allunyar-se de plantejaments reduccionistes, sovint de caràcter materialista (Kawachi et al., 2002).

Freqüentment, s'ha considerat que un baix nivell educatiu, assolit durant les primeres etapes vitals, condueix a una ocupació poc qualificada que comporta una modesta situació financera (Lahelma et al., 2004). Aquest fet ha provocat que diverses investigacions en epidemiologia social utilitzin el nivell educatiu com a representatiu dels altres indicadors, argumentant que l'educació és un determinant fonamental de la situació financera de les famílies (Ross and Wu, 1995), dels recursos disponibles tant a nivell material com psicosocial i de la probabilitat d'atur o d'ocupació precària (von dem Knesebeck et al., 2006). Això no obstant, aquestes consideracions es contraposen amb els resultats del present estudi: a l'ocupació i als ingressos tan sols se'ls pot atribuir, conjuntament, un 20% de la relació entre nivell educatiu i depressió. A més, les relacions d'ocupació, ingressos i educació amb la depressió presenten diferents variables mediadores que comporten diferents explicacions causals. En el cas de l'educació, factors materials, psicosocials i conductuals tan sols s'atribueixen, conjuntament, un 28% de la relació, fet que suggereix l'existència d'explicacions alternatives. En aquest sentit, a més de les explicacions habituals fonamentades en l'educació com a determinant d'ingressos, ocupació, comportaments relacionats amb la salut i accés a xarxes socials (Lee, 2011), al llarg de la literatura revisada hem detectat dues explicacions fonamentades, respectivament, en l'autocontrol i la reserva cognitiva. Així, l'educació, com a font de capital humà, pot permetre un major autocontrol i més capacitat d'influir en el curs dels esdeveniment vitals, afavorint el benestar emocional (Mirowsky i Ross, 1998). Per altra banda, el nivell educatiu tindria un efecte positiu sobre la reserva cognitiva, concepte que es refereix a la tolerància cognitiva o psíquica davant els canvis cerebrals fisiològics relacionats amb l'edat, que no presenta simptomatologia clínica (Meng i D'Arcy, 2012) i que ha estat

identificat com a factor protector contra la depressió i associat a una major qualitat de vida en persones grans (Lara et al., 2017).

La prevalença de la depressió va ser significativament menor a Finlàndia que a Espanya, mentre que a Polònia va romandre en un punt intermedi. Els resultats del present estudi són coherents amb una investigació prèvia que va comparar diferents països segons el seu coeficient de Gini i va proposar el valor de 0,3 com a llindar potencial a partir del qual l'impacte de la desigualtat en la salut pot arribar a ser significativament superior (Kondo et al., 2012). Això podria explicar per què l'associació entre residir a Espanya -l' únic dels tres països que supera el llindar- i la depressió va romandre estadísticament significativa en els models ajustats.

En canvi, els nostres resultats no són coherents amb un estudi recent que va comparar 23 països europeus i que va detectar un estat de salut general més pobre a Polònia que a Espanya (Muntaner et al., 2017). Això no obstant, aquest estudi no es va centrar en la depressió i va utilitzar dades recol·lectades entre el 2003 i el 2010, un període en el que potser l'efecte de la crisi financera no era tan evident com ho ha estat en els darrers anys. En aquest sentit, diversos autors han mostrat la realitat d'un impacte més fort de la crisi financera a Espanya en comparació amb altres països europeus (Karanikolos et al., 2013), i que aquest impacte sembla haver tingut una clara repercussió en la prevalença de depressió (Reibling et al., 2017).

En resum, l'estudi confirma les hipòtesis plantejades: cada indicador d'estatus socioeconòmic es relaciona amb la depressió a través de diferents mediadors, i la soledat és el factor més fortament associat a la depressió de forma independent, encara que amb una capacitat de mediació limitada. Aquests resultats suggereixen la necessitat metodològica d'avaluar els diferents indicadors d'estatus socioeconòmic de forma complementària i d'evitar plantejaments absolutament materialistes a l'hora d'aproximar-nos als condicionaments socials de les desigualtats en salut. A més dels factors mediadors plantejats en l'estudi, que són propis de les teories psicosocials, conductuals i materials, també hem obtingut resultats que poden ser presos en consideració en l'aproximació a altres teories. En relació a la teoria biomèdica, l'estudi aporta evidències de que la relació entre estatus socioeconòmic i depressió és, en gran mesura, independent de l'efecte de les condicions socioeconòmiques sobre les condicions cròniques somàtiques que han estat seleccionades com a variables d'ajust.

Finalment, també hem aportat evidència, en aquest cas limitada pel baix nombre de casos (3 països), sobre l'efecte de la desigualtat estructural en la prevalença de depressió.

4.2.- Xarxes socials, soledat i depressió.

Després de fer-ne un seguiment de 2 anys, es constata que l'associació longitudinal entre soledat i TDM és bidireccional però més forta amb la soledat com a origen (OR=1,22 IC 95%=1,15-1,30), mentre que els nivells més elevats d'integració social s'associen de forma unidireccional a una menor probabilitat de TDM (OR=0,57 IC 95%=0,34-0,96). L'associació entre la soledat i el subseqüent decreixement de la integració social també es dona de forma unidireccional (OR=0,93 IC 95%=0,90-0.96).

L'estat civil i la mida de les xarxes socials podrien jugar un rol en l'associació entre depressió i soledat: entre les persones que no senten soledat, aquelles que han perdut la parella sentimental (per separació, divorci o viudetat) presenten una major probabilitat de patir TDM independentment de la mida de la xarxa social (p=16.0% IC95%=14,9-17.1); mentre que, entre les persones que senten soledat, aquelles que tenen parella sentimental i una xarxa social d'una mida inferior a la mitjana mostren més probabilitats de patir TDM (p=52.9% IC95%=49.6-56.4).

4.2.1.-Relacions longitudinals

La soledat va estar clarament associada a la probabilitat de patir un trastorn de depressió major (TDM) o d'ansietat generalitzada (TAG) 2 anys després, inclús després d'ajustar ambdós associacions per variables socioeconòmiques, sociodemogràfiques i relacionades amb la salut. En el sentit invers, tan sols el TAG va romandre significativament associat a la soledat en el model ajustat. Els resultats del present estudi són coherents, per una banda, amb aquells autors que plantegen que és la soledat la causa de la depressió i no a la inversa i, per l'altra, amb aquells que proposen que l'estigma que pateixen les persones amb trastorn mental provoca un efecte en les seves interaccions socials que faciliten els sentiments de soledat.

Entre els nombrosos estudis que proposen la soledat com a factor causal de la depressió (Ahmed et al., 2014; Cacioppo et al., 2006; Santini et al., 2016), destaca un estudi longitudinal de 5 anys amb 4 punts temporals de recollida de dades, amb una mostra representativa de les persones de 50 i més anys residents a Chicago, per la seva habilitat a l'hora d'ajustar la relació per nombroses característiques individuals

associades simultàniament a soledat i simptomatologia depressiva com ara l'aïllament social objectiu, la negativitat general, l'estrès objectiu i percebut i el suport social percebut (Cacioppo et al., 2010). Existeixen menys estudis sobre la soledat com a predictora de l'ansietat i, la major part, inclouen també la depressió com a factor a predir i conclouen que la relació entre soledat i ansietat és menys robusta que la que es dona entre soledat i depressió (McHugh et al., 2019; Muyan et al., 2016), en consonància amb els nostres resultats.

Els sentiments de soledat de les persones amb trastorns mentals compta amb un limitat suport empíric en estudis quantitatius (Dahlberg et al., 2014). Tanmateix, existeixen algunes aproximacions qualitatives que ens han descrit l'estigmatització de les persones amb problemes de salut mental i la seva conseqüent sensació de no ser desitjats per l'entorn i de no sentir-se importants (Erdner et al., 2005). Aquestes persones se senten soles, sense amics i amb una gran sensació de buidor, malgrat tenir contactes socials amb familiars o gent propera (Granerud i Severinsson, 2006), una sensació que ha estat descrita com "una mirada al món a través d'una finestra esmerilada" (Lindgren et al., 2014). Els resultats d'aquests estudis mostren que les persones amb problemes de salut mental no veuen necessàriament reduïdes les seves interaccions socials sinó que aquestes es donen de forma qualitativament diferent. Aquest raonament és coherent amb el fet de que no haguem detectat una relació longitudinal entre trastorns mentals i aïllament social en un sentit objectiu però sí entre trastorns mentals i soledat.

L'efecte independent de l'aïllament social i la soledat sobre la depressió i l'ansietat, així com un efecte més robust de la soledat, és coherent amb els resultats d'un recent estudi de controls i casos que va concloure que els indicadors de funcionament social conductuals (com la freqüència de les interaccions) i, amb més fortalesa, els afectius (com la soledat) són predictors independents de psicopatologia futura en pacients de depressió i ansietat (Saris et al., 2017). En general, els estudis que comparen l'efecte de la soledat sobre la incidència dels trastorns mentals comuns amb l'efecte d'altres aspectes relacionats amb les xarxes socials en un sentit objectiu, acostumen a detectar un major efecte de la soledat. Per exemple, un estudi longitudinal amb persones de més de 55 anys residents a Amsterdam va mostrar que la soledat -i no la mida de la xarxa social- preveia el TAG (Beekman et al., 1998). En

aquesta mateixa línia, un estudi sobre els factors predictors dels símptomes d'ansietat en persones centenàries va mostrar relacions significatives per a la soledat i no per al número de visites (Ribeiro et al., 2015). Com en el cas de l'ansietat, una recent revisió sistemàtica mostra com, entre les persones grans, la depressió ha estat detectada més freqüentment com a factor relacionat amb la soledat que no pas amb característiques objectives de les xarxes socials (Courtin i Knapp, 2017). La preeminència dels factors qualitatius de les xarxes socials com a factors explicatius del benestar de les persones grans en detriment dels aspectes quantitatius, podria ser explicada per la teoria de la selectivitat emocional (Carstensen, 2006), segons la qual les persones que perceben el temps vital com un recurs particularment escàs, tendeixen a prioritzar aspectes qualitatius de la seva vida social i a limitar-se a les relacions emocionalment segures.

Els trastorns d'ansietat i depressió són freqüentment comòrbids. Un estudi va quantificar que el 60% de les persones amb TDM i el 70% de les persones amb TAG pateixen també episodis de l'altre trastorn mental (Lamers et al., 2011). Segons els nostres resultats, la relació entre TDM i TAG és bidireccional. D'acord amb els resultats d'una recent metaanàlisi, aquesta vinculació es dona amb més intensitat en períodes curts de temps i es debilita en períodes llargs (Jacobson i Newman, 2017). La majoria d'estudis atribueix al TAG una major capacitat predictiva de l'altre trastorn (Jacobson et al., 2017; Jacobson i Newman, 2016). La relació entre ambdós trastorns ha estat explicada per mitjà de variables de mediació relacionades amb les xarxes socials. Per exemple, entre persones grans recentment enviudades, el suport social percebut ha estat identificat com a mediador entre la simptomatologia depressiva i l'ansiosa en un període de seguiment de quatre anys (Jacobson et al., 2017). Per altra banda, les percepcions de no ser acceptats o estimats han mediat significativament la relació entre l'ansietat adolescent i la depressió durant l'edat adulta (Jacobson i Newman, 2016).

Tot i que la majoria d'investigadors plantegen que és l'aïllament social una de les causes de la soledat (Dahlberg et al., 2018; Routasalo et al., 2006), segons els resultats del present estudi és la soledat el que causa l'aïllament social, és a dir, les persones grans se senten soles abans d'estar-ho. Tot i que aquests resultats s'oposen als resultats de gran part de la literatura, alguns investigadors han mostrat que soledat i aïllament social mantenen una correlació de feble a moderada (Cornwell i Waite,

2009) i han proposat que els individus tendeixen a reduir els seus contactes socials quan comencen a experimentar un deteriorament de les seves capacitats físiques i mentals necessàries per a mantenir un determinat nivell de compromís social (Achenbaum i Bengtson, 1994). Tanmateix, aquests resultats no aporten un explicació directa sobre la relació longitudinal entre els sentiments de soledat i la subseqüent pèrdua d'integració social.

L'explicació podria trobar-se en la teoria evolutiva de la soledat, segons la qual la soledat provoca "comportaments categoritzats en termes d'aptitud evolutiva com a egoistes" (Cacioppo et al., 2018). En altres paraules, l'individu atribuiria inconscientment als sentiments de soledat una percepció negativa del seu context social que fomentaria el comportament egoista com a mecanisme de protecció. Així, les funcions adaptatives de la soledat que, hipotèticament, van facilitar la supervivència en el Pleistocè, podrien tenir conseqüències perjudicials a l'era moderna i comportar l'aïllament social objectiu. La teoria evolutiva de la soledat ha estat complementada per estudis que prenen en consideració una semblança entre el dolor físic i el dolor "social" a nivell neurològic, la qual cosa explicaria aquest efecte en el comportament. Això no obstant, des d'aquesta mateixa perspectiva s'ha justificat la soledat com a predictora de l'aïllament social i exactament el contrari, suggerint que la soledat forma part d'un mecanisme evolutiu que propicia la reparació i el manteniment de les connexions amb altres persones (Cacioppo et al., 2006a). Segons aquesta concepció, de la mateixa manera que el dolor físic és una senyal aversiva que va evolucionar per propiciar la presa de mesures que minimitzin el dany físic, la soledat és un estat aversiu que ens motiva a actuar per a minimitzar el dany al cos social, amb especial intensitat en individus que ocupen posicions perifèriques de les xarxes socials (Cacioppo et al., 2009).

En general, l'objectiu d'analitzar les associacions longitudinals entre les variables preses en consideració ha estat assolit malgrat limitar-se a un període de seguiment de dos anys. Probablement, amb un temporalitat més llarga o, millor encara, amb la possibilitat d'analitzar l'evolució de les variables durant les diferents etapes vitals, els resultats haguessin estat més complets. Contràriament a les nostres expectatives, ha estat la soledat la causa de l'aïllament social i ambdós factors han estat associats de forma independent a la depressió. La teoria evolutiva de la soledat està cridada a explicar la relació longitudinal entre soledat i aïllament social i a

aportar un major coneixement sobre els factors causals que uneixen les condicions socials amb la salut mental i el benestar de les persones.

4.2.2.-El rol de les xarxes socials

Soledat i depressió van presentar diferències en la seva relació amb les variables socioeconòmiques i sociodemogràfiques. En el model ajustat, la depressió -i no la soledat-, va mantenir-se com a significativament relacionada amb les variables de caràcter socioeconòmic com educació i ingressos mentre que la soledat tan sols va romandre associada a variables que directament podrien tenir un efecte sobre les oportunitats d'interacció social com ara l'estat civil, viure en un entorn urbà o la mida de la xarxa social.

La mancança de relacions significatives entres indicadors d'estatus socioeconòmic i soledat contrasta amb els resultats d'una revisió sistemàtica, publicada el 2016, que va identificar varis estudis amb relacions significatives entre soledat i variables socioeconòmiques com ara ingressos (n=13) i nivell educatiu (n=15) (Cohen-Mansfield et al., 2016). Tanmateix, la majoria d'aquestes relacions eren correlacions, la qual cosa seria compatible amb els resultats del nostres models de regressió sense ajustar. Tan sols nou estudis inclosos en la revisió sistemàtica aportaven relacions significatives entre aquestes variables en models de regressió ajustats, i la majoria d'aquests relacions es donaven en segments específics de la població o a través de mesures de soledat poc utilitzades. Per exemple, els ingressos de la llar van ser significativament associats a la soledat tan sols entre persones grans que no estaven casades (Cohen-Mansfield et al., 2009). Altres estudis van mesurar la soledat utilitzant una mesura consistent en un únic ítem derivat d'una escala de depressió (Fokkema et al., 2012) o a través d'un dimensió específica de la soledat anomenada "soledat familiar" (Drenan et al., 2008), referida a uns sentiments de soledat que formen part de la soledat emocional i que es donen exclusivament en l'entorn familiar (DiTommaso et al., 2004). En la mateixa línia, l'educació també ha estat associada a la soledat en cohorts específiques de la població. Així, un baix nivell educatiu ha estat associat a la soledat en dones (Greenfield i Russell, 2011), i en persones grans amb dificultats físiques per desenvolupar les tasques diàries (Iecovich i Biderman, 2012). Per tant, la revisió sistemàtica aporta una evidència limitada sobre l'existència d'una relació entre estatus socioeconòmic i soledat que sigui independent

de determinats factors de confusió i que sigui aplicable a la població general. En el cas de l'educació, són tres els estudis que aporten aquesta evidència (Palgi et al., 2012; Theeke, 2010; Victor et al., 2005) i dos en el cas dels ingressos (Losada et al., 2012; Theeke, 2010). Entre aquests, tan sols dos dels estudis van considerar la simptomatologia depressiva com a factor de confusió (Palgi et al., 2012; Victor et al., 2005) i cap d'ells va prendre en consideració el TDM. Així doncs, l'evidència de que els factors socioeconòmics tinguin un efecte sobre la possibilitat de patir soledat independent de la depressió és altament limitada i inexistent si es pren en consideració el TDM com a variable de confusió.

En el cas de l'estat civil succeeix a la inversa que en el de les variables socioeconòmiques: en el model ajustat, l'estat civil roman significativament i robusta associat a la soledat. En comparació amb les persones casades, la probabilitat de patir soledat és 4 vegades més elevada entre les persones solteres i 6 vegades entre les persones prèviament casades. En canvi, la relació entre estat civil i TDM deixa de ser significativa en ajustar el model, la qual cosa suggereix que l'efecte de l'estat civil sobre la probabilitat de patir TDM podria estar mediat en un elevat percentatge pels sentiments de soledat. El fet de tenir parella sentimental sembla ser una oportunitat per ampliar les interaccions socials mentre que la pèrdua de la parella sentimental podria posar en risc les relacions existents. Alguns investigadors s'han referit a que les persones grans tendeixen a abandonar algunes de les activitats socials que feien acompanyades de la parella quan la perden (per ruptura o traspàs), la qual cosa explicaria perquè les persones grans que mai han estat casades i, particularment, les que ho han estat prèviament (separades, divorciades o vídues) acostumen a comptar amb unes xarxes socials més reduïdes (Dykstra i de Jong Gierveld, 2004; Pinquart, 2003) i un inferior nivell de benestar (Shapiro i Keyes, 2008). En els darrers anys, alguns investigadors s'han preguntat si els canvis d'actitud cap als comportaments familiars no tradicionals que s'han succeït en el món occidental durant les darreres dècades (Treas ety al., 2014) podrien comportar diferències significatives en la relació entre estat civil i soledat en persones grans. Comparant dades del 1993 i del 2013, els autors van concloure que el canvi social no ha modificat essencialment la relació. Tanmateix, les dones vídues presenten una major habilitat per a mantenir les seves xarxes socials, la qual cosa podria explicar-se per les diferències de gènere en l'experiència de la soledat, on els homes dependrien més que les dones de la seva

parella a l'hora de proveir-se d'una vida emocional satisfactòria (Rokach et al., 2007). Aquest efecte positiu dels rols de gènere per a la vida social de les vídues podria veure's afavorit pel fet que determinades opcions relacionals en les vídues no estan tan estigmatitzades en els darrers any com en el passat (van Tilburg i Suanet, 2018).

La mida de la xarxa social, i no aspectes qualitatius com la profunditat emocional o la freqüència de les interaccions va ser l'únic component que es va associar significativament a la soledat i a la depressió en els models ajustats. La darrera metanàlisi que es va dur a terme comparant l'efecte de característiques quantitatives i qualitatives de la xarxa social en la probabilitat de sentir soledat va concloure que les característiques qualitatives mostraven un major efecte que les quantitatives (Pinquart i Sorensen, 2001). Tanmateix, els resultats d'aquesta revisió sistemàtica no entren necessàriament en contradicció amb els nostres resultats ja que la comparació entre estudis focalitzats en aspectes qualitatius i quantitatius separadament no és útil per a entendre com es relacionen entre si ambdós tipus de factors. En aquest sentit, un estudi va analitzar els efectes directes d'aspectes quantitatius de les xarxes socials i potencials mediacions de factors qualitatius i va concloure que el nombre de relacions socials afectava directament els sentiments de soledat tot i presentar efectes indirectes a través del nivell de satisfacció amb les pròpies relacions socials (Heylen, 2010). Aquests resultats aporten constatació empírica a les propostes que, des de la teoria de les provisions socials, conceben la mida de la xarxa social com un indicador fiable d'integració social, que facilita un millor desenvolupament de les relacions emocionals i que es vincula directament a la soledat (Weiss, 1973) i, al mateix temps, són coherents amb la perspectiva cognitiva de la solitud, que concep la solitud com una experiència subjectiva que resulta d'una avaluació comparativa de les relacions socials reals i les desitjades (Cacioppo, et al. 2009).

De forma compatible amb els nostres resultats, una revisió sistemàtica publicada el 2015 va confirmar que el suport social percebut i unes xarxes socials quantitativament àmplies i diverses en composició, juguen un paper particularment important com a factors protectors contra la depressió en la població general. Tanmateix, els autors assenyalen que calen estudis addicionals per abordar com les percepcions, en comparació amb les mesures objectives, afecten la incidència de

depressió; a més, pocs estudis van incloure mesures sobre els efectes de les interaccions negatives, la qual cosa podria proporcionar uns resultats més informatius (Santini et al., 2015). Aplicant-ho al nostre estudi, les interaccions negatives podrien explicar perquè més del 50% de les persones que senten soledat i estan casades pateixen TDM malgrat que el fet d'estar casat sigui un factor protector de la soledat en la població general.

La relació entre TDM i soledat observada en el present estudi és particularment robusta: les persones que senten soledat o que pateixen TDM tenen al voltant de quinze vegades més probabilitats de patir TDM o soledat, respectivament. Aquesta forta associació entre soledat i depressió, així com la seva proximitat conceptual en estar ambdós factors vinculats a sensacions desagradables, han comportat la inclusió d'ítems com "em sentia sol" en determinades mesures de simptomatologia depressiva (Radloff, 1977). Això no obstant, des d'una perspectiva teòrica, Weiss (1973) ja distingia entre ambdós factors caracteritzant la soledat com una sensació vinculada a les connexions socials en particular i la depressió com la forma en què la gent se sent en general. A més, diversos investigadors han mostrat que la soledat i els símptomes depressius només estan correlacionats moderadament en persones de mitjana i avançada edat (Adams et al., 2004; Cacioppo et al., 2006) i, d'acord amb els resultats del present estudi, ambdós factors podrien presentar diferents condicionants socials: mentre la depressió es veuria més afectada per les característiques socioeconòmiques, la soledat es veuria més afectada per les característiques sociodemogràfiques.

Segons els nostres resultats, quan la soledat està vinculada a la mida de la xarxa social es troba més fortament associada a la depressió que quan està vinculada a la mancança d'una parella sentimental. En general, els resultats del present estudi són consistents amb el model proposat per Cacioppo et al. (2009), segons el qual els casos de soledat es donen principalment en els nodes situats a la perifèria de les xarxes socials on es propaga a través d'un procés que qualifica com a "contagiós", un procés similar al que Rosenquist et al. (2011) atribueix a la simptomatologia depressiva. En línia amb aquests models, suggerim que existeixen dos tipus de solitud en funció de la posició que l'individu ocupa a la xarxa social. El primer tipus, que seria l'experimentat per persones a la perifèria de la xarxa social, és a dir, persones amb

menys enllaços, estaria més relacionat amb la depressió; mentre que en el cas dels individus amb posicions centrals a la xarxa social, és a dir, aquells amb un major nombre d'enllaços, la soledat no estaria tan vinculada a la depressió i, en la majoria dels casos, tendiria a ser de tipus emocional, és a dir, vinculat a l'absència de relacions de caràcter íntim. Utilitzant la terminologia de Weiss (1973) la soledat característica de les zones perifèriques de la xarxa social seria la soledat social mentre que la soledat característica de les zones centrals seria la soledat emocional.

Com a conclusió, a través de l'estudi del rol dels diferents components de les xarxes socials en la relació entre soledat i depressió ha estat possible confirmar la nostra hipòtesi inicial segons la qual la soledat mesurada com a constructe unidimensional està més fortament associada a la depressió quan es vincula a una reduïda xarxa social que no pas quan es vincula a la mancança d'una parella sentimental. Per tant, si volem analitzar els efectes de la soledat sobre la depressió, podria ser molt útil recuperar les aportacions de Weiss (1973) respecte la distinció entre la soledat emocional i social. Malgrat que aquesta distinció ha estat presa en consideració durant les darreres dècades per investigadors, fonamentalment europeus, que han utilitzat l'escala de solitud emocional i social de De Jong Gierveld (De Jong Gierveld i Tilburg, 2006; Dykstra et al., 2004; Baarsen et al., 2001), la majoria dels investigadors continuen utilitzant una conceptualització unidimensional de la soledat, mesurada a través de l'escala de solitud de la Universitat de Califòrnia - Los Angeles (UCLA), argumentant una elevada correlació entre les hipotètiques dimensions de la soledat i unes conseqüències difícilment distingibles (Cacioppo et al., 2006; Hawkley i Cacioppo, 2003; Russell, 1996). Tanmateix, els resultats del present estudi, malgrat utilitzar l'escala de la UCLA, podrien contradir aquest darrer argument i encaixar amb les aportacions de Weiss (1973), segons les quals les experiències subjectives de la soledat social i emocional són qualitativament diferents, ja que la soledat social provoca sentiments d'avorriment i depressió, mentre que la soledat emocional estaria vinculada a altres conseqüències simptomatològiques.

4.3.-Capital social, estatus socioeconòmic i soledat.

Entre els participants més pobres, els individus més vells presentaren una probabilitat inferior de patir soledat en comparació amb els més joves (OR=0,09 CI95%=0,02-0,30), mentre que entre els participants de millor nivell socioeconòmic no es van detectar diferències significatives entre cohorts d'edat. Els participants d'elevat capital social individual que vivien en una àrea d'elevat capital social de barri presentaren una probabilitat inferior de patir soledat (OR=0,36 CI95%=0,17-0,73), mentre que entre els participants que vivien en una àrea de baix capital social de barri no es trobaren diferències significatives segons el capital social individual.

Segons els nostres resultats i de forma contradictòria als resultats obtinguts en una recent revisió sistemàtica d'estudis sobre els factors de risc de la soledat (Cohen-Mansfield et al., 2016), l'envelliment no està directament relacionat amb una major probabilitat de soledat. Malgrat que fer-se gran està inherentment associat a alguns dels principals factors de risc de la soledat com ara la viudetat, la pèrdua de familiars i amics o l'inici de condicions de salut cròniques, en ajustar la relació per aquests factors de risc, l'envelliment passa a estar inversament associat a la soledat, la qual cosa podria explicar-se per un major grau d'autoacceptació que les persones desenvolupen amb l'edat i que propicia el benestar psicosocial (Meléndez et al., 2009).

Altres autors han proposat que la relació entre edat i soledat no és directament o inversa proporcional sinó que la corba que quantificaria la relació en un gràfic de coordenades tindria forma de U. Així, el grup d'edat de 61 a 79 anys comptaria amb una prevalença inferior de soledat en comparació amb el grup de 50 a 60 anys, per una banda i, per l'altra, amb el de 80 i més anys. Segons aquesta proposta, l'envelliment s'associa a un major benestar quan les pèrdues socials i les limitacions de salut permeten satisfer un nivell mínim de necessitats socials, és a dir, quan és possible limitar-se a relacions emocionalment segures que permetin un determinat nivell de benestar psicosocial malgrat es redueixi el nombre de contactes socials. Un raonament que és plenament coherent amb la teoria de la selectivitat emocional (Carstensen, 2006). En canvi, quan la disminució física o sensorial i l'acumulació de

pèrdues de familiars i amics arriben a impedir la satisfacció d'aquest nivell mínim de necessitats socials, l'envelliment torna a estar directament associat a la soledat. (Pinquart i Sorensen, 2001). Tanmateix, aquesta proposta no va poder ser provada en el nostre estudi degut a la baixa proporció de participants en la franja d'edat de 80 o més anys.

La relació entre ser dona i tenir una major probabilitat de sentir soledat en comparació amb els homes deixa de ser significativa en el model ajustat. Per tant, la relació entre gènere i soledat podria explicar-se pel fet que les dones tenen una esperança de vida més elevada -i, per tant, més probabilitats de patir afeccions cròniques, de ser vídues i de perdre familiars i amics- però no pel fet de ser dona. Conseqüentment, en ajustar el model pels factors de risc, la relació entre gènere i soledat no va romandre com a estadísticament significativa. Aquests resultats i aquesta interpretació són coincidents amb nombrosos estudis previs (Cohen-Mansfield et al., 2016; Pinquart i Sorensen, 2001).

D'acord amb les nostres expectatives, els nivells baixos d'estatus socioeconòmic només es van associar significativament a una major probabilitat de patir soledat entre les persones grans de la franja d'edat més jove (50-59 anys). Aquestes diferències entre cohorts podrien ser explicades per un biaix de supervivència: la soledat i la pobresa podrien incrementar les probabilitats de mortalitat precoç (Holwerda et al., 2012) o d'incidència de problemes greus de salut mental com ara la demència (Holwerda et al., 2014), mentre que el fet de no sucumbir als efectes negatius d'uns factors socioeconòmics desfavorables sobre la salut mental i el benestar psicosocial, redueix les probabilitats de sucumbir a aquets efectes a mesura que s'envelleix (Bruce, 2002).

Segons els resultats del present estudi, a la zona d'elevat capital social de barri, els individus de baix capital social cognitiu, és a dir, que no se senten integrats en la xarxa de reciprocitat vinculada al capital social estructural, tindrien dificultats per construir relacions alternatives i, per tant, una major probabilitat de soledat. Aquest efecte podria ser particularment significatiu entre persones de baix estatus socioeconòmic, com suggereixen estudis previs que van mostrar un efecte significatiu del capital social estructural com a moderador de la relació entre estatus socioeconòmic i salut (Uphoff et al., 2013) i que els efectes beneficiosos del capital

social individual sobre la salut són més forts en els barris socioeconòmicament vulnerables, on les persones disposen de menys recursos alternatius (Marmot i Bell, 2012). D'altra banda, a la zona de baix capital social de barri, no hi va haver diferències significatives segons el capital social individual. En aquesta zona, la vida social dels seus habitants no sembla dependre de la integració en la xarxa de reciprocitat vinculada al capital social estructural.

Aquests resultats comporten una reflexió sobre la conceptualització de capital social. Segons Coleman (1990) -un dels precursors del concepte-, el capital social és "un bé públic, que beneficia a tots aquells que formen part d'una estructura i un actiu potencial per als més desfavorits"; mentre que estudis previs distingiren entre el capital social comunitari o estructural i el capital social cognitiu o individual. El capital social comunitari -com el capital social de barri- ha estat definit com el conjunt de recursos socials inherents a les xarxes comunitàries (Carpiano, 2006); mentre que el capital social individual es refereix a aquelles mesures que avaluen les percepcions de confiança, reciprocitat i suport entre les persones (Harpham et al., 2002). Des de perspectives properes a la definició de Coleman, no s'accepta aquesta distinció entre diferents tipus de capital social segons nivell d'anàlisi tot i acceptar que, a nivell individual, viure en una àrea d'elevat capital social comporta major probabilitats d'establir relacions socials satisfactòries (Kawachi i Berkman, 2000). Segons aquesta interpretació, el capital social contribueix a aportar oportunitats relacionals que, en si mateixes, redueixen la probabilitat de sentir soledat independentment del capital social estructural de la zona on es visqui. En canvi, segons els resultats del present estudi, el capital social cognitiu tan sols pot tenir un efecte com a factor protector contra la soledat en zones amb un determinat nivell de capital social estructural. Per tant, el capital social cognitiu no pot ser considerat com una conseqüència més del capital social estructural en el benestar psicosocial individual sinó que aquesta conseqüència està restringida al propi capital social estructural i, per tant, ambdós factors poden ser considerats com a diferents dimensions d'un mateix concepte vinculades a diferents nivell d'anàlisi: el capital social estructural seria el terreny social on es desenvolupa el capital social cognitiu.

A partir d'aquestes consideracions, el capital social cognitiu és fàcilment mesurable a través de les percepcions individuals sobre les relacions de reciprocitat i confiança que es mantenen amb els veïns (Harpham et al., 2002). En canvi, el capital

social estructural és més complex de mesurar. En el nostre estudi, Sant Boi de Llobregat va ser dividit en dues àrees sobre les quals vam inferir diferents nivells de capital social de barri. La zona de baix capital social de barri va incloure el centre històric i la zona al voltant del centre, construïda abans de 1965, mentre que la zona d'elevat capital social de barri incloïa la zona restant, construïda després de 1965 per acomodar a les persones provinents de la migració massiva des de les zones rurals d'Espanya a les zones industrials de Barcelona (Alio, 1977). Aquesta àrea compta amb associacions de veïns més actives i una part important de la vida social està gestionada per organitzacions recreatives i associacions culturals pròpies de les regions d'origen dels seus habitants (Ajuntament de Sant Boi de Llobregat, 2014). Complementàriament, vam comprovar que aquesta zona presentava majors nivells de capital social cognitiu.

La importància del capital social sobre la soledat i la salut ha estat presa en consideració amb particular intensitat durant la darrera dècada (Uphoff et al., 2013; Marmot i Bell, 2012). A Catalunya, s'han dut a terme intervencions amb l'objectiu de reduir la soledat entre persones grans a través de la promoció de la participació social i del desenvolupament de xarxes de col·laboració entre centres sanitaris i usuaris (Coll-Planas et al., 2015). A la llarga, aquestes xarxes de cooperació podrien afavorir la creació de capital social estructural. Tanmateix, segons Putnam (1993), en referir-se a la possibilitat de crear capital social en llocs on no n'hi ha: "quan es tracta d'una construcció d'institucions (i no una mera constitució), el temps es mesura en dècades", fet que suggereix la necessitat d'aplicar esforços per preservar el capital social allà on es doni a través del respecte a l'autonomia de la comunitat i de la facilitació del seu desenvolupament.

En resum, a través de l'anàlisi de l'impacte de la interacció entre estatus socioeconòmic i edat, així com entre capital social cognitiu i capital social col·lectiu, en la probabilitat de sentir solitud, hem pogut confirmar les nostres hipòtesis inicials segons les quals l'associació entre estatus socioeconòmic i soledat és més robusta en les persones grans més joves (de 50 a 60 anys) i l'associació entre capital social cognitiu i soledat és significativa entre persones que viuen en àrees d'elevat capital social estructural, fet que comporta la consideració de capital social estructural i capital social cognitiu com dues dimensions complementàries d'un mateix concepte.

4.4.- Intervencions psicosocials.

El present estudi evidencia les dificultats de les persones grans socialment aïllades per a reconstruir o millorar les característiques de les seves xarxes socials, amb especial incidència entre aquelles persones amb un baix nivell socioeconòmic. Una situació que pot ser progressivament agreujada pels sentiments de solitud. D'acord amb els nostres resultats, en el que respecta a les estratègies per prevenir la depressió, la creació d'ambients socials capaços de pal·liar els efectes del deteriorament de les xarxes socials provocat pel pas del temps, amb especial incidència en els esdeveniments de transició com ara la viudetat, el retir i altres factor de risc per a la soledat, és un desafiament com a mínim tan important com el tractament psicològic a través de la teràpia cognitiva conductual, o la reversió de part de les conseqüències de la pobresa a través de les polítiques redistributives.

Els resultats del present estudi suggereixen alguns aspectes a tenir en compte a l'hora de plantejar intervencions per reduir la soledat i millorar el benestar de les persones grans. En primer lloc, la soledat és una condició modificable: moltes persones que senten soledat poden canviar el seu estatus per si soles, sense necessitat d'una intervenció externa. En canvi, algunes conseqüències de la soledat, com la depressió, presenten una elevada estabilitat a través del temps, particularment entre persones grans. En segon lloc, la soledat no sempre condueix a la depressió amb la mateixa intensitat. Quan la soledat està vinculada a una reducció de les xarxes socials, aquesta relació temporal és molt més robusta. Finalment, la soledat ha estat associada a factors sociodemogràfics com ara la viudetat o el retir, mentre que la depressió ha estat relacionada amb factors socioeconòmics com ara els ingressos de la llar o l'educació. Per tant, la soledat podria estar vinculada a esdeveniments de transició que provoquen canvis profunds en les quotidianitats individuals, mentre que la depressió podria estar vinculada a factors més estables al llarg del curs de la vida com són els indicadors d'estatus socioeconòmic. Així, els resultats d'estudis previs que assenyalaven una menor fortalesa de les dificultats en curs en comparació amb els esdeveniments de transició com a factors de risc de depressió en persones grans (Forsell, 2000), podrien ser una conseqüència del robust vincle que uneix aquest trastorn mental amb la soledat, condició que podria actuar com a variable de confusió latent.

D'aquestes observacions deduïm que, per optimitzar la rendibilitat de les intervencions destinades a pal·liar la soledat entre persones grans: (1) han de tenir en compte la població en risc, és a dir, el conjunt de persones que es troben en esdeveniments de transició o, directament, que senten soledat, (2) han de centrar-se en la millora de les relacions socials, i (3) han de estar orientades a la millora del seu estat de salut i, particularment, a reduir la prevalença de depressió. Tot i que en aquest treball no podem demostrar directament la validesa de la nostra proposta si que podem tractar d'aproximar-nos a la seva validesa a través de la valoració dels resultats d'intervencions prèvies. Una metanàlisi publicada el 2011, en va identificar quatre tipus: (a) millorar les habilitats socials, (b) millorar el suport social, (c) augmentar les oportunitats d'interaccions social i (d) abordar el dèficit en cognició social a través de teràpia cognitiu-conductual. La metanàlisi va revelar que els estudis que van utilitzar aquesta darrera estratègia, van obtenir uns resultats més favorables (Masi et al., 2011).

Això no obstant, si ens centrem en els resultats dels estudis destinats a millorar els sentiments de soledat exclusivament en persones grans (de 50 o més anys) els resultats no són tan clars. La teràpia cognitiu-conductual va ser plantejada en tres ocasions i tan sols va obtenir resultats significatius com a estratègia reductora de la soledat en un estudi entre persones institucionalitzades a les quals se'ls va aplicar vuit sessions de teràpia grupal de 90 minuts durant vuit setmanes. Cada sessió estava focalitzada en diferents aspectes: (1) salutació; (2) expressió de sentiments; (3) identificació de relacions positives en el passat i reflexió sobre com aplicar aspectes positius de les relacions passades en les relacions presents; (4) posada en comú d'històries familiars i d'històries de vida; (5) anàlisi dels efectes dels esdeveniments de transició en el benestar; (6) presa de consciència d'èxits personals i identificació d'objectius; (7) enumeració dels recursos positius disponibles; i (8) revisió global de les vuit sessions i comiat. Es va identificar un efecte positiu i significatiu a curt termini (3 mesos de seguiment) sobre la simptomatologia depressiva, el benestar psicològic i la soledat, entre les persones que havien intervingut en el grup experimental en comparació amb les del grup de control (Chiang et al., 2010). Tanmateix, els resultats positius d'aquesta teràpia podrien tenir a veure amb les conseqüències de les teràpies grupals sobre les oportunitats d'interacció entre els residents de la institució més que pels continguts de les sessions en si mateixos. Per tant, factors com la institucionalització dels participants, la seva presència física en les

sessions i un curt període de seguiment, podrien contribuir a explicar els resultats significatius de l'estudi de forma independent al contingut terapèutic de les sessions. Aquesta reflexió és coherent amb el fet que un estudi que utilitzava una teràpia similar a través de vuit sessions grupals telefòniques entre persones que portaven una mitjana de tres anys cuidant a cònjuges supervivents d'ictus, no va obtenir resultats significatius després de mig any de seguiment (Hartke i King, 2003). Finalment, un altre tipus de teràpia inclosa en la metanàlisi que ha estat provada entre persones grans institucionalitzades amb resultats significatius, ha estat la teràpia assistida per animals (Banks et al., 2008). La metanàlisi no presenta resultats sobre aquesta mateixa teràpia aplicada en persones grans no institucionalitzades.

Les escasses intervencions que s'han dut a terme entre persones grans no institucionalitzades amb resultats significatius, guarden alguna relació amb els punts que hem proposat i, a banda de tenir l'objectiu de proporcionar suport social, oportunitats d'interacció o una major habilitat comunicativa, poden estar orientades a l'obtenció de millors resultats de salut en general (Collins i Benedict, 2006), o a la reducció de la simptomatologia depressiva (Evans et al., 1982; Shapira et al., 2007), i focalitzades en poblacions de risc com ara persones grans amb discapacitat visual (Evans et al., 1982) o persones amb un evident i progressiu decreixement de la seva capacitat funcional (Ollonqvist et al., 2008). Fonamentalment, les tècniques utilitzades han estat basades en classes -o grups de debat amb dinamitzadors- que es repeteixen setmanalment. Les sessions presenten diferents orientacions com ara la promoció del comportament saludable, la reducció dels accidents a la llar i estratègies financeres per gestionar recursos limitats (Collins i Benedict, 2006), la resolució de problemes i el foment de la camaraderia entre els membres del grup (Evans et al., 1982); l'ús d'internet en general, i d'aplicacions concretes com ara el correu electrònic (Shapira et al., 2007); o la reflexió sobre la situació de la gent gran i la promoció de l'autocura, en combinació amb l'assessorament psicològic i sessions d'activitat física (Ollonqvist et al., 2008).

Tanmateix, existeixen estudis amb tècniques similars que no van assolir resultats significatius (Fokkema i van Tilburg, 2007; Martina and Stevens, 2006; McAuley et al., 2000) i, en general, els estudis inclosos en la revisió de Masi et al. (2011) no són útils per a confirmar o refutar la nostra proposta ja que la majoria no

estan focalitzades en persones amb un alt nivell de soledat o immerses en esdeveniments de transició que actuen com a factor de risc. Bàsicament són intervencions destinades a la millora de les relacions socials entre persones grans amb l'objectiu de tenir un efecte positiu sobre diferents resultats relacionats amb la salut o el benestar psicosocial, incloent la soledat. En canvi, la nostra proposta es fonamenta en la intervenció sobre la soledat com a factor predictor de posteriors problemes patològics i psicosocials, destacant-ne la depressió.

Una revisió sistemàtica amb metanàlisi sobre estudis d'intervencions psicosocials per a la prevenció de la depressió en persones grans va detectar trenta estudis i va concloure que les intervencions psicosocials tenen un efecte petit però estadísticament significatiu per reduir els símptomes depressius entre els adults majors (Forsman et al., 2011). Tanmateix, tan sols 2 estudis amb intervencions basades en el foment de les activitats o del suport social van ser inclosos en la metanàlisi i, malgrat que van mostrar una efectivitat més robusta en comparació amb intervencions basades en altres aspectes com ara l'exercici físic o la formació en habilitats cognitives o estratègies de gestió de la vida quotidiana, els investigadors van destacar la necessitat d'estudis addicionals que poguessin reforçar els resultats obtinguts (Forsman et al., 2011). Un d'aquests estudis estava focalitzat en persones grans institucionalitzades que havien d'oferir sessions de conversa en anglès a estudiants internacionals (Yuen et al., 2008) i, l'altre, en persones grans en bon estat de salut i no institucionalitzades que van participar en una coral de cant professional amb assajos setmanals durant 30 setmanes i diverses actuacions públiques (Cohen et al., 2006). En ambdós casos, les persones que van formar part del grup d'intervenció van mostrar, posteriorment, resultats positius com ara nivells inferiors de simptomatologia depressiva i sentiments de soledat o minimització de les despeses sanitàries en comparació amb les persones del grup de control. Tanmateix, aquests resultats no difereixen gaire dels inclosos en la revisió de Masi et al. (2011). En ambdós casos no es selecciona els participants segon els factors de risc o els sentiments de soledat i la intervenció no es basa en reduir els sentiments de soledat per tal d'obtenir millor resultats en salut sinó que l'efecte de les intervencions sobre la soledat podrien ser considerats com a col·laterals.

Altres estudis que no han estat inclosos en ambdues revisions sistemàtiques en no ajustar-se a algun dels criteris d'inclusió, van utilitzar una metodologia que s'adequa més a la nostra proposta o que ens aproximen més a la seva validació. Aquests estudis aporten informació sobre les conseqüències en la salut i en la despesa sanitària de les intervencions psicosocials destinades a fer front a la soledat i, en línia amb els nostres plantejaments, tot i no estar necessàriament orientats a la reducció de la prevalença de depressió, parteixen de la necessitats d'intervenir sobre individus en risc de soledat (Onrust et al., 2008) o que, directament, senten soledat (Pitkala et al., 2009).

El primer dels estudis descriu una intervenció sobre dones recentment enviudades, basada en visites d'una voluntària amb més temps de viudetat i degudament formada per a oferir suport social i suggerir estratègies per eixamplar les interaccions socials. El grup d'intervenció va obtenir uns millors resultats en salut a través de l'indicador de "anys viscuts ajustats a qualitat". Malgrat que intervencions similars havien obtingut també resultats positivament significatius (Stevens i Van Tilburg, 2000; Stevens et al., 2006), la novetat d'aquest estudi és que aporta dades relatives a la despesa del grup d'intervenció, que va ser superior e les del grup de control tot i tenir en compte factors com ara pèrdua de productivitat i despeses en sanitat (Onrust et al., 2008). Per tal de rendibilitzar les intervencions, els investigadors proposen ajustar-les més a poblacions en risc i, en aquest sentit, restringir les intervencions a persones que senten soledat podria ser una bona opció.

De forma coherent amb aquesta proposta, en el segon dels estudis, els participants van ser seleccionats si prèviament havien informat d'elevats sentiments de soledat. Els investigadors van organitzar intervencions psicosocials en diferents grups amb l'objectiu d'avaluar els seus efectes sobre la salut subjectiva, la mortalitat i l'ús i els costos dels serveis de salut. Les intervencions es va dur a terme en 15 grups (cadascun amb 7-8 participants i 2 facilitadors professionals) que es van reunir durant 3 mesos en 12 ocasions. Les sessions estaven orientades a promoure el suport i la integració social entre la gent gran. Segons els interessos dels participants es van dur a terme diferents activitats: (a) escriptura terapèutica i psicoteràpia de grup, (b) exercicis i discussions en grup i (c) activitats artístiques. Dos anys després, la supervivència entre els participants del grup d'intervenció era del 97%, mentre que la

dels membres del grup de control era del 90%. A més, els participants en els grups d'intervenció van mostrar una millora significativa de la salut subjectiva i uns costos d'atenció mèdica significativament inferiors en comparació amb els dels membres del grups de control (Pitkala et al., 2009).

Posteriorment, es van provar intervencions inspirades en aquest mètode a Catalunya, en una zona mixta rural-urbana i en dues àrees urbanes de diversos nivells socioeconòmics. En aquest cas, s'hi van incloure mesures relatives a la simptomatologia depressiva. La intervenció consistia en una acció coordinada i en un programa de sessions grupals. L'acció coordinada tenia com a objectiu la construcció i el reforç de xarxes de col·laboració entre els centres d'atenció primària i altres centres propers a cada comunitat on les persones grans podien desenvolupar les seves activitats. El programa de sessions en grup estava orientat a la promoció del suport social i de la participació cívica. Com en l'estudi anterior, els participants seleccionats per a l'estudi havien d'informar prèviament de sentiments de soledat. La novetat d'aquest estudi és la construcció de la xarxa de suport social que té com a objectiu la consolidació dels resultats obtinguts a través de la creació de capital social estructural; una estratègia que requereix d'estudis posteriors per tal d'avaluar la seva viabilitat a llarg termini. En referència a les conseqüències de la intervenció, dos anys més tard, es van mantenir gran part dels seus efectes en la vida social dels membres dels grups d'intervenció i la simptomatologia depressiva presentava nivells inferiors en comparació amb la dels membres del grup de control (Coll-Planas et al., 2015).

Els resultats dels darrers estudis suggereixen que la utilització dels sentiments de soledat com a factor predictor de diferents problemes de salut i, particularment, de la depressió, pot ser una eina molt efectiva de cara a orientar les intervencions psicosocials que tinguin com a objectiu millorar les condicions de vida de les persones grans. A més, és possible que aquestes intervencions no suposin una despesa addicional. Els resultats del present estudi, contribueixen a la comprensió dels factors de risc de la soledat i del seu efecte sobre les xarxes socials i la probabilitat de patir depressió, per la qual cosa podrien ser útils per a augmentar l'efectivitat i la rendibilitat econòmica de futures intervencions.

4.5.- Fortaleses i limitacions.

Tot i que les fortaleses i limitacions d'aquest estudi han estat exposades en cadascun dels articles publicats i se n'ha fet alguna referència durant la discussió, creiem convenient presentar a mode de resum els principals punts forts i dèbils del present treball. La fortalesa més important és la possibilitat de generalitzar els resultats obtinguts a tota la població de persones grans dels territoris presos en consideració en cadascun dels estudis (Espanya, Finlàndia, Polònia, Irlanda i Sant Boi de Llobregat). Els països europeus, a més, han estat seleccionats per permetre la comparació entre diferents realitats socioeconòmiques (Eikemo et al., 2008). La metodologia utilitzada (mostratge polietàpic no proporcional i sense substitucions), ha permès obtenir mostres representatives de les poblacions estudiades. A més, les dades obtingudes proporcionen informació comparable a nivell internacional per la seva relació amb treballs internacionals com són *Ageing and Retirement in Europe* (SHARE) (Börsch-Supan et al., 2005) o els propis *The Irish Longitudinal Study on Ageing* (TILDA) (Whelan and Savva, 2013) i *Collaborative research on ageing in Europe* (COURAGE in Europe) (Leonardi et al., 2014) on s'emmarquen els tres primers articles. El quart article, forma part de *Sant Boi Ageing Study* (SBAS) i utilitza una metodologia derivada de COURAGE. En tots aquests estudis, es recull informació sobre les principals variables estudiades com ara la depressió major (Haro et al., 2006), la soledat (Russell, 1996) o els components de les xarxes socials (Berkman i Syme, 1979) per mitjà d'eines ben validades i internacionalment utilitzades que afavoreixen la possibilitat d'efectuar comparacions entre estudis i doten de més robustesa als resultats obtinguts. Això no obstant, els nostres resultats han de ser interpretats tenint en compte les següents limitacions.

A excepció de l'estudi longitudinal sobre la relació entre soledat, aïllament social i trastorns efectius (Domènech-Abella et al., 2018), el disseny transversal de la resta d'estudis impedeix la possibilitat d'analitzar relacions longitudinals o d'inferir causalitat. Tanmateix, en el cas de l'anàlisi dels factors mediadors de la relació entre estatus socioeconòmic i depressió (Domènech-Abella et al., 2018a), 2 dels indicadors socioeconòmics presos en consideració, com són educació i millor estatus ocupacional assolit durant el curs de la vida, acostumen a ser temporalment estables entre persones grans, per la qual cosa podem atribuir un grau de temporalitat a

l'anàlisi. En aquest estudi, existeixen altres limitacions com ara el fet de no haver inclòs tots els factors conductuals, materials i psicosocials que podrien actuar com a mediadors segons la literatura revisada. Malgrat el nostre esforç per recopilar els principals factors en cada camp, la inclusió d'altres factors podria haver tingut un efecte sobre els resultats. Una altra limitació, en aquest cas compartida amb l'estudi de *Sant Boi Ageing Study* (SBAS) sobre estatus socioeconòmic, envelliment i capital social (Domènech-Abella et al., 2017), és una relativament baixa taxa de resposta que, en el cas de Finlàndia i de Sant Boi de Llobregat és propera al 53%. Això no obstant, malgrat no existir normes estrictes al respecte, aquestes taxes de resposta poden considerar-se adequades (Draugalis et al., 2008) i similars a les que es troben en altres estudis de població general europea (Börsch-Supan, et al., 2005). L'estudi de SBAS inclou una altra limitació; en aquest cas relativa a la divisió de la ciutat en dues grans àrees segons nivell de capital social de barri. Malgrat els nostres esforços per justificar aquesta divisió a través de l'estudi de la realitat associativa i de la prevalença de participants amb nivells elevats de capital social cognitiu de cada àrea, la divisió pot comportar biaixos a causa de les diferències sociodemogràfiques i socioeconòmiques existents en cadascuna de les àrees. Finalment, existeixen altres limitacions compartides per tots els estudis que composen el present treball (Domènech-Abella et al., 2018, 2018a, 2017, 2017a) com ara que les dades han estat preses a través de mesures d'autoinforme, motiu pel qual podria existir un biaix d'informació, i que existeixen valors perduts en totes les mesures que també podrien afectar als resultats, malgrat haver comparat variables sociodemogràfiques entre les poblacions amb i sense valors perduts sense obtenir diferències significatives.

4.6.- Implicacions i futures línies d'investigació.

La comprensió dels possibles canvis que es donen en les trajectòries vitals individuals en el context d'unes societats en procés d'envelliment i que veuen progressivament accentuades les diferències socials, esdevé un repte de primera magnitud en el món occidental. En aquesta direcció, el projecte on s'emmarca aquest treball: *Ageing Trajectories of Health: Longitudinal Opportunities and Synergies* (ATHLOS) (Caballero et al., 2017), ofereix oportunitats per a la recopilació de dades sobre l'envelliment, la salut i el seus condicionants socials a través de diferents estudis amb mostres representatives de diferents països i amb l'objectiu d'implementar un conjunt de dades longitudinals harmonitzat que permeti fer comparacions vàlides i ajudi a generar normes que puguin ser útils en la pràctica clínica i les intervencions psicosocials.

El present treball ha confirmat els efectes de la soledat sobre la salut física i mental entre les persones grans així com els seus principals factor de risc. La soledat ha estat associada a la pèrdua de la parella sentimental (Pinquart, 2003b), a una xarxa social deficient en aspectes qualitatius o quantitatius (Routasalo et al., 2006), a múltiples problemes de salut física i mental (Rico-Uribe et al., 2016) i, particularment, a la depressió (Cacioppo et al., 2006). Tanmateix, la principal aportació ha estat la de detectar aquells aspectes que no comptaven amb un clar consens científic i proposar respostes empíricament contrastades. Així, segons els resultats del present estudi, la soledat és la causa de l'aïllament social i ambdós factors tenen un efecte independent sobre la probabilitat de patir depressió. Això no obstant, aquestes afirmacions obren altres preguntes que futurs estudis amb dades longitudinals més extenses o, millor encara, amb dades que incloguin informació sobre tot el cicle de la vida, haurien de respondre. Es tracta de preguntes relatives a com s'origina la soledat i si aquesta té els mateixos efectes al llarg de totes les etapes vitals.

Tenim potencials respostes a aquestes preguntes, la veracitat de les quals hauria de ser sotmesa a constatació empírica. Segons la nostra hipòtesi, la soledat és sovint una conseqüència dels esdeveniments de transició habituals entre persones grans com ara la viudetat, el retir o la incidència de condicions cròniques físiques o mentals. Aquests esdeveniments provoquen un replegament en si mateix que es correlaciona amb una subseqüent pèrdua dels contactes socials, unes conseqüències

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que els partidaris de la selectivitat emocional (Carstensen, 2006) atribuirien a una priorització de les relacions emocionalment segures en detriment d'aspectes quantitatius de les xarxes socials. Segons la nostra hipòtesi, les conseqüències de la soledat no tenen perquè ser les mateixes durant tota la vida sinó que durant l'etapa reproductiva la soledat podria provocar l'augment dels esforços de socialització per tal d'accedir a nous recursos relacionals capaços de substituir les pèrdues derivades dels esdeveniments de transició i establir noves oportunitats per a la procreació. Aquesta hipòtesi encaixa molt bé en la teoria evolutiva de la soledat (Cacioppo et al., 2018) pel fet que aquesta se centra en els aspectes que propicien la reproducció i, a més, perquè podria contribuir a explicar les diferències existents en gerontologia social entorn la necessitat d'eixamplar (Havighurst, 1961), mantenir (Lowenthal, 1975) o reduir (Carstensen, 2006) les xarxes socials a mesura que les persones es fan grans per preservar el seu benestar psicosocial; unes diferències que també es donen entre el partidaris de la teoria evolutiva de la soledat (Cacioppo et al., 2018, 2006a). Futurs estudis que comptin amb la possibilitat d'analitzar dades longitudinals que incloguin totes les etapes de vida, podran aproximar-se a una millor comprensió de la soledat i dels factors determinants per al benestar psicosocial i biomèdic de les persones grans.

Aquesta concepció evolutiva de la soledat és compatible amb l'existència de dues dimensions que podrien ser total o parcialment coincidents amb les d'altres concepcions bidimensionals de la soledat (Giervveld i Tilburg, 2006). Una de les dimensions estaria vinculada a la recerca de noves interaccions socials i l'altra ho estaria a un replegament en un mateix o en l'entorn més íntim. Una tindria com a darrer objectiu accedir a noves oportunitats reproductives i l'altra defensar la pròpia descendència davant canvis en l'entorn social immediat. Una continuaria sent funcional en l'era moderna mentre que l'altra seria clarament disfuncional i, per tant, hauria de ser corregida mitjançant intervencions psicosocials. En aquest sentit, si bé s'ha avançat significativament en la darrera dècada gràcies a intervencions focalitzades en persones grans que senten soledat o que es troben en esdeveniments de transició (Coll-Planas et al., 2015; Pitkala et al., 2009), un major coneixement de la soledat podria contribuir a la seva optimització.

Capítol 5

CONCLUSIONS

Conclusions

The main conclusions of these population-based studies of European adults aged 50+ years are:

1. Psychosocial factors and loneliness showed the strongest associations with depression among mediator variables. However, material factors and, especially, financial strain had a higher mediating function in the association between all socioeconomic status markers and depression. Other factors that significantly mediated the relationship were the behavioural factors, in the case of education, and the psychosocial factors, in the case of employment.

2. The longitudinal association between loneliness and depression is bidirectional, although stronger with loneliness as a source, while the higher levels of social integration are associated unidirectionally to a lower probability of major depression. The association between loneliness and the subsequent decline of social integration is also unidirectional.

3. Among people feeling lonely, those with depression were more frequently married and had a small social network. Among those without loneliness, depression was associated with being previously married. In depressed people, feelings of loneliness were associated with having a small social network; while among those without depression, feelings of loneliness were associated with being previously married.

4. Among the younger participants, individuals with lower socioeconomic status had a higher probability of suffering from loneliness, whereas differences on loneliness for older participants according to their socioeconomic status were not found.

5. Participants having high individual social capital and living in an area with high neighbourhood social capital presented a lower probability of suffering from loneliness.

The present study shows the difficulties of socially isolated elderly people to rebuild or improve the characteristics of their social networks, especially those with low socioeconomic status. This situation can be progressively exacerbated by feelings of loneliness. According to our findings, regarding strategies to prevent depression, the creation of social environments capable of alleviating the effects of the deterioration of social networks caused by the passage of time is a challenge at least as important as psychological treatment through behavioural cognitive therapy or the reversal of the poverty consequences through redistributive policies. These strategies should be directed at older adults feeling loneliness or being on transition events such as widowhood, retirement and other risk events for loneliness.

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ANNEXOS

A1.- Sociodemographic factors associated with changes in successful aging in Spain: a follow-up study

Paper A1

Sociodemographic factors associated with changes in successful aging in Spain: a follow-up study

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Article

Sociodemographic Factors Associated With Changes in Successful Aging in Spain: A Follow-Up Study

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Abstract

Objective: Successful aging (SA) refers to maintaining well-being in old age. Several definitions or models of SA exist (biomedical, psychosocial, and mixed). We examined the longitudinal association between various SA models and sociodemographic factors, and analyzed the patterns of change within these models. **Method:** This was a nationally representative follow-

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up in Spain including 3,625 individuals aged ≥50 years. Some 1,970 individuals were interviewed after 3 years. Linear regression models were used to analyze the survey data. **Results:** Age, sex, and occupation predicted SA in the biomedical model, while marital status, educational level, and urbanicity predicted SA in the psychosocial model. The remaining models included different sets of these predictors as significant. In the psychosocial model, individuals tended to improve over time but this was not the case in the biomedical model. **Conclusion:** The biomedical and psychosocial components of SA need to be addressed specifically to achieve the best aging trajectories.

Introduction

The growing number of people in older age groups in Spain is a matter of public health concern. According to the Spanish National Statistics Institute, 24.1% of the Spanish population was 60 years old or over in 2016 (Instituto Nacional de Estadística, 2017). This percentage is projected to rise to 33.5% (11 million people) by 2030, according to the United Nations. This percentage of older adults in Spain by 2030 is higher than the average figure for Europe (29.6%) and especially Eastern Europe (25.7%; United Nations, 2015).

The United Nations describes current population aging as a widespread phenomenon with unprecedented and profound implications for many facets of human life. The pace of demographic change differs greatly across regions, and countries that tackle this trend later will have less time to adapt. Responding to the needs of an increasingly aging population has been identified by the European Commission as one of the political challenges of the 21st century (European Commission, 2006) and has led to an increase in scientific research into the aging process. A number of studies propose an alternative view to the pessimistic, traditional perspective on aging as unavoidable, progressive disengagement from an active life (Cumming & Henry, 1961). These more optimistic studies foster a view of elderly individuals as active agents in society.

One of the most commonly used terms to refer to the notion of "aging well" in scientific literature has been successful aging (SA). Rowe and Khan (1998) first operationalized three criteria for SA: freedom from disease and disability, high cognitive and physical functioning, and productive engagement. Since

then, several other SA models have been proposed with three general definitions: biomedical, psychosocial, and combinations of the two (bio-psychosocial; Bowling & Dieppe, 2005). The distinct SA models can be assessed using either self-rated or researcher-measured indicators (Gu et al., 2017). The variety of definitions and indicators make the comparison of SA prevalence rates among studies difficult, with figures ranging from 0.5% to 95% (Depp & Jeste, 2006).

In a recent systematic review, five broad SA-component categories were proposed: physiological status (physical and mental health), commitment (social participation), well-being (satisfaction with life), personal resources (resilience and autonomy), and external factors (socioeconomic indicators) (Cosco, Prina, Perales, Stephan, & Brayne, 2013b). Physiological status and personal resources are related to biomedical models whereas commitment and well-being have a psychosocial nature. Our previous study used these categories to design a complete model that encompasses all five broad SA-component categories (Perales et al., 2014).

Those studies, comparing biomedical and psychosocial (Depp & Jeste, 2006) or researcher-defined and respondent-rated SA models (Gu et al., 2017) have shown that the correlates of one model are poor predictors of others. The aim of this study was to examine the longitudinal association between various SA models and sociodemographic factors. We also aimed to analyze the patterns of change in SA over time using these different models.

Method

Study Design

This study was part of the Collaborative Research on Aging in Europe (COURAGE in Europe) project (Leonardi et al., 2014), a longitudinal survey of the noninstitutionalized adult population (aged ≥18 years). In Spain, the first wave was conducted between July 2011 and May 2012 and the second wave between December 2014 and June 2015.

A total of 4,753 participants were initially interviewed: 962 aged 18 to 49; 3,312 aged 50 to 79; and 479 aged 80 and over. To achieve appropriate representation of the Spanish population, a stratified multistage clustered area probability method was used. Age cohorts 50 to 79, and 80 and over were oversampled, given that these individuals were the main study target. The individual response rate was 69.9% at baseline and 69.5% during follow-up.

Face-to-face structured interviews were carried out at respondents' homes using Computer-Assisted Personal Interviewing (CAPI). The survey questionnaire was initially developed in English and then translated into Spanish

following World Health Organization translation guidelines for assessment instruments (Üstun, Chatterji, Mechbal, & Murray, 2005). Quality assurance procedures were implemented during fieldwork. During Wave 1, participants with severe cognitive impairment, judged at the interviewer's discretion or based on a previous diagnosis of dementia, were not interviewed and a shorter version of the questionnaire was administered to proxy respondents. At the beginning of the second interview, some 3 years later, a second cognitive screening questionnaire was used to assess any changes in patients' cognitive abilities (Lobo, Ezquerra, Gómez-Burgada, Sala, & Seva-Díaz, 1979).

For the current analyses, we excluded 958 individuals aged <50 years and 170 proxy respondents from the first wave, leaving a sample of 3,625 individuals eligible for our study. Of these, for Wave 2, 4.86% had died, 25.49% refused further visits, 4.28% could not be located, and 11.03% could not be contacted for some other reason. Furthermore, 84 (4.26%) proxy individuals from Wave 2 were excluded as information on main variables was not available. Therefore, the final study sample consisted of 1,886 participants. Sampling weights were generated to compensate for the survey design and nonresponse in the follow-up assessment, so that the results were representative of the Spanish population (Moussavi et al., 2007).

Ethics Statement

Ethical approval for the COURAGE study Spain was provided by Parc Sanitari Sant Joan de Déu, Barcelona, Spain, and Hospital la Princesa, Madrid, Spain. Written informed consent was obtained from all participants in both waves.

Measurements

Sociodemographic characteristics. Participants were asked to provide sociodemographic data on age, sex, level of education, marital status, occupation, and urbanicity. Education was categorized as incomplete primary school, primary school, lower secondary school, upper secondary school, and "college/ university." Information on marital status was classified as follows: never married, currently married, cohabiting, separated/divorced, and widowed. ISCO 08 categories were used to define occupation (European Union, 2009). ISCO 08 classification contains nine main groups which were classified into three skills: elementary occupations as Skill Level 1, occupations between plant/machine operators and assemblers/clerical support workers as Skill Level 2, and technicians and associate professionals, professionals, and managers as Skill Level 3.

Biomedical variables. Chronic medical conditions were assessed based on self-report diagnoses of chronic lung disease, asthma, hypertension, arthritis, stroke, angina, and diabetes in the previous 12 months. In addition, a symptom algorithm was used to detect nondiagnosed cases of arthritis, stroke, angina, chronic lung disease, and asthma (Garin et al., 2016).

The 12-item interviewer-administered version of the World Health Organization Disability Assessment Schedule Version II (WHODAS-II; World Health Organization, 2012) was used to assess disability. Participants were asked to report the level of difficulty they had in performing various activities such as dressing or concentrating during the previous 30 days using a 5-point scale (*none* = 1, *mild* = 2, *moderate* = 3, *severe* = 4, and *extreme/ cannot do* = 5). The total score ranges from 0 to 100 with higher scores indicating greater disability.

An adapted version of the Composite International Diagnostic Interview (CIDI 3.0) was used to assess the presence of depression in the previous 12 months (Haro et al., 2006). An algorithm based on the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-IV*; American Psychiatric Association, 1994) was used. Cognitive functioning was assessed using five performance tests measuring three domains: learning and short-term memory, working memory, and verbal fluency. A composite of these five scores was calculated (He, Muenchrath, & Kowal, 2012). The total score ranges from 0 to 100 with higher scores indicating better cognition.

Tobacco consumption was assessed by asking whether participants were daily smokers, nondaily smokers, former smokers, or had never smoked. Alcohol consumption was assessed by asking whether participants were lifetime abstainers, and if not, the pattern of alcohol consumption in the previous week. They were then classified as lifetime abstainers, occasional drinkers (no consumption in previous 7 days), non-heavy drinkers (consumed alcohol in previous 7 days), and heavy drinkers (consumed alcohol >1-2 days per week, with five or more standard drinks in past 7 days for men and four or more for women).

Physical activity was measured using the Global Physical Activity Questionnaire (Armstrong & Bull, 2006), which collects information on physical activity in three settings as well as sedentary behavior, consisting of 16 questions about activity at work, travel to and from places, and recreational activities.

Psychosocial variables. Social participation was measured using 11, five-point Likert-type scale questions ranging from *never* to *daily* on how often in the previous 12 months the person had participated in activities such as attending public meetings or meeting community leaders. Social contacts were

measured using 10, five-point Likert-type scale questions ranging from *never* to *daily* on how often in the previous 12 months the person had had contact with other people such as their partner, children, or neighbors.

Social support was measured using the Oslo social support scale (Bøen et al., 2012). This scale consists of three items: "How many people are you so close to that you can count on them if you have great personal problems? (from 1 = *none* to 4 = *more than five*)," "How much interest and concern do people show in what you do? (from 1 = *a lot* to 5 = *none*)," and "How easy is it to get practical help from neighbors if you should need it? (from 1 = *very easy* to 5 = *very difficult*)."

Self-rated quality of life was measured with a single 5-point Likert-type scale question with responses on a range from *very good* to *very bad*. Control and coping were measured using a 5-point Likert-type scale question with responses ranging from *never* to *very often* on how frequently in the previous 2 weeks the participants had been unable to control important things in their lives and to cope with things they had to do.

External variables. Environmental safety was measured through two items asking, "In general, how safe from crime and violence do you feel at home?" and "How safe do you feel when walking down your street (neighborhood) alone after dark?" ranging from *completely safe* to *not safe at all* on a 5-point Likert-type scale. Respondents were asked for their best estimates of total household income, including income from wages or stipends from a job as well as income from unemployment benefit, pensions, investments, aid to families, or other government or nongovernment benefits during the previous 12 months.

SA models. The indicators used for the construction of the distinct SA models were selected on the basis of previous literature (Cosco, Matthew Prina, Perales, Stephan, & Brayne, 2014; Cosco, Prina, Perales, Stephan, & Brayne, 2013a, 2013b) and their operationalization has previously been reported (Perales et al., 2014). Specifically, the following models and indicators were considered: (a) biomedical, requiring no presence of any chronic medical conditions, a score below the median on the WHODAS-II (i.e., from 0 to 3), a value equal to or above the median in the cognition composite score (i.e., from 51 to 100), no presence of depression in the previous 12 months, not being a current smoker, being an occasional drinker or lifetime abstainer, and being engaged in moderate or high physical activity; (b) psychosocial, requiring engagement in three or more separate social activities at least once a month, having three or more social contacts with at least 1 month of frequency, a score ranging from 12 to 14 on the Oslo social support scale, good

or very good self-reported quality of life, never or almost never unable to control important things in life, and never or almost never unable to cope with things they have to do; (c) Rowe and Khan's (1998) definition of SA, which requires no presence of chronic medical conditions, a score below the median on the WHODAS-II, a value equal to or above the median in the cognition composite standardized total score by education, no presence of depression in the previous 12 months, and being engaged in three or more different social participation activities at least once a month; (d) a complete model of SA that included all those indicators and external components (household income equal to or above the median and very or completely safe in both items: at home and on the street). These models were operationalized as the sum of the different indicators assigning one point to each one. In all cases, higher scores indicate better SA.

Statistical Methods

Stata software (version SE 12) was used to analyze the survey data. Descriptive analyses were conducted to characterize the study sample in both waves. These analyses included weighted proportions, unweighted frequencies, means, and standard deviations. Differences between means of the complete SA model in categories of sociodemographic variables at baseline and follow-up were tested through Student's *t* tests and ANOVA. We also tested these SA means by comparing individuals who had completed the follow-up interview with those who had not according to each of the specific reasons given.

We fitted linear regression models to evaluate which baseline sociodemographic factor predicted the SA change from baseline to follow-up for each model. The level of statistical significance for all analyses was set at .05. Beta coefficients, 95% confidence intervals, adjusted R^2, and p values were reported in each model.

Stability of SA was analyzed by calculating the intraclass correlation coefficient (ICC) between baseline and follow-up. In addition, the proportion of individuals that improved, got worse, or remained stable were plotted for each SA model. According to Cicchetti (1994), the average correlation is poor from 0 to .39, fair from .40 to .59, good from .60 to .74, and excellent from .75 to 1.00.

Results

Table 1 summarizes the sociodemographic characteristics of the participants at baseline and follow-up with mean SA scores for each category using the

Table 1. Sociodemographic Characteristics of the Participants at Baseline and Follow-Up, and Mean Scores (0-15) of SA Using the Complete Model.

	Baseline n (%)	SA (BL) M (SD)	p value[a]	FU n (%)	SA (FU) M (SD)	p value[a]
Sample size	3,625 (100.0)	8.6 (2.3)	—	1,886 (100.0)	8.9 (2.1)	—
Sex						
Women	1,982 (53.7)	8.5 (2.3)	<.001	1,009 (51.6)	8.7 (2.2)	.005
Men	1,643 (46.3)	8.8 (2.2)		877 (48.4)	9.0 (2.0)	
Age						
50-59 years	1,206 (32.2)	8.9 (2.3)	<.001	702 (36.6)	9.2 (2.1)	<.001
60-69 years	1,041 (28.2)	8.8 (2.2)		562 (29.2)	9.1 (2.1)	
70-79 years	999 (29.3)	8.4 (2.3)		477 (26.7)	8.4 (2.1)	
80+ years	379 (10.3)	7.8 (2.1)		145 (7.5)	8.0 (2.0)	
Highest education level						
College/university	393 (10.8)	9.6 (2.2)	<.001	233 (12.4)	9.8 (1.9)	<.001
Upper secondary school	541 (14.5)	9.2 (2.1)		289 (15.1)	9.4 (2.0)	
Lower secondary school	408 (11.1)	8.7 (2.2)		209 (10.7)	9.0 (2.0)	
Primary school	1,075 (31.3)	8.7 (2.2)		566 (31.1)	8.9 (2.0)	
Incomplete primary school[b]	1,207 (32.3)	8.0 (2.2)		589 (30.7)	8.2 (2.2)	
Occupation[c]						
Skill level 1	541 (16.7)	8.2 (2.2)	<.001	273 (15.7)	8.5 (2.1)	<.001
Skill level 2	1,559 (48.8)	8.7 (2.2)		815 (49.5)	8.8 (2.1)	
Skill level 3	680 (19.9)	9.2 (2.3)		381 (21.7)	9.6 (2.0)	
Never worked	497 (14.6)	8.3 (2.2)		248 (13.1)	8.5 (2.1)	
Marital status						
Never married	310 (8.5)	8.6 (2.3)	<.001	168 (9.2)	8.9 (2.1)	<.001
Currently married	2,189 (60.6)	8.8 (2.2)		1,202 (65.3)	9.1 (2.0)	
Cohabiting	69 (1.8)	8.5 (2.1)		30 (1.7)	9.3 (1.4)	
Separated/divorced	266 (7.0)	8.3 (2.3)		139 (6.6)	8.4 (2.3)	
Widowed	791 (22.1)	8.1 (2.4)		347 (17.2)	8.3 (2.2)	
Urbanicity						
Rural	487 (16.2)	8.5 (2.2)	.150	269 (17.3)	8.7 (2.2)	.088
Urban	3,138 (83.8)	8.6 (2.3)		1,617 (82.7)	8.9 (2.1)	

Note. Unweighted frequencies (*n*), and weighted proportions are displayed, or as otherwise indicated. SA = successful aging; BL = baseline; FU = follow-up; *n* = frequency.
[a]Student's *t* tests and ANOVA tests were carried out to compare means of SA among categories.
[b]Include no formal education received.
[c]ISCO 08 categories were grouped into three levels according to their skill level. Skill Level 1 corresponds to elementary occupations. Skill Level 2 corresponds to occupations between plant and machine operators, and assemblers and clericals support workers. Skill Level 3 corresponds to technicians and associate professionals, professionals, and managers.

Table 2. Comparison of Baseline SA Scores Among Participants Who Participated at Follow-Up and Those Who Did Not Using the Complete SA Model.

	SA (BL)[a] M (SD)	p value[c]
Completed interview	8.7 (2.2)	—
Final refusal by a family member	8.8 (2.1)	.553
Unable to locate household or individual	9.2 (2.3)	.015
House is vacant or different household occupants	8.6 (2.3)	.703
Deceased	7.5 (2.2)	>.001
Individual respondent in an institution	6.6 (2.4)	>.001
Final refusal by individual respondent	8.7 (2.3)	.888
Did not sign the informed consent for follow-up	8.2 (2.4)	>.001
Other[b]	8.4 (2.2)	.321

Note. SA = successful aging; BL = baseline.
[a]Complete model of SA at baseline. Higher scores indicate more SA.
[b]"Other" includes partial interviews or no interview because individual respondent was not eligible, language barrier, unsafe or dangerous area, or address that did not exist.
[c]Student's *t* tests were carried out to compare means of active aging between completed interview and the remaining categories.

complete model. The means of SA scores were higher at the follow-up than at the baseline (8.6 vs. 8.9). Significantly higher SA scores were also found in men, younger individuals, participants with a higher level of education and occupation, and those who were married or cohabiting.

Table 2 shows complete model SA score means at baseline stratified by participation and reasons for not participating at the follow-up. Individuals who were in an institution, deceased, or did not sign the informed consent form at follow-up assessment had significantly lower SA scores than those in the longitudinal data (6.6, 7.5, 8.2 vs. 8.7; *p* < .001).

Table 3 shows linear associations between sociodemographic factors at baseline and SA at follow-up adjusted for SA at baseline using distinct SA definitions. Men had significantly higher scores on the psychosocial model and women had higher scores on the biomedical. Age was inversely associated with all SA models except the psychosocial. There was an education gradient, with those with a lower level of education showing lower SA scores than those with higher education. A similar gradient was found for occupation, although individuals who had never worked did not show statistically significant lower SA scores. The gradients were least marked in the biomedical model. Widows had lower SA scores than participants who were married or cohabiting across all models. People living in urban areas scored higher on SA in the psychosocial model.

Table 3. Linear Regression Models Showing Associations Between Sociodemographic Variables at Baseline and SA at Follow-Up Adjusted for SA at Baseline Using Different SA Models.

	Rowe and Khan's model rating (0-5) at follow-up[a] β (95% CI)	Biomedical model rating (0-7) at follow-up[a] β (95% CI)	Psychosocial model rating (0-6) at follow-up[a] β (95% CI)	Complete model rating (0-15) at follow-up[a] β (95% CI)
Sex				
Women	Ref.	Ref.	Ref.	Ref.
Men	.01 [−.09, .10]	−.18** [−.31, −.05]	.19** [.06, .33]	.19 [−.04, .43]
Age (in years)	−.03*** [−.03, −.02]	−.02*** [−.03, −.01]	−.00 [−.01, .00]	−.03*** [−.04, −.02]
Highest education level				
College/university	Ref.	Ref.	Ref.	Ref.
Upper secondary school	−.03 [−.21, .15]	.01 [−.24, .25]	−.10 [−.40, .20]	−.20 [−.56, .15]
Lower secondary school	−.24* [−.44, −.03]	−.03 [−.27, .21]	−.25* [−.46, −.04]	−.40* [−.77, −.03]
Primary school	−.30** [−.50, −.10]	−.13 [−.34, .08]	−.21 [−.46, .04]	−.43* [−.77, −.09]
Incomplete primary school[b]	−.59*** [−.80, −.39]	−.28* [−.51, −.06]	−.59*** [−.83, −.34]	−.96*** [−1.33, −.59]
Occupation				
Skill Level 1	Ref.	Ref.	Ref.	Ref.
Skill Level 2	.23** [.09, .38]	.11 [−.07, .28]	.20* [.01, .39]	.28* [.01, .55]
Skill Level 3	.41*** [.22, .59]	.25* [.06, .44]	.43** [.18, .67]	.77*** [.44, 1.09]
Never worked	−.07 [−.25, .11]	.00 [−.20, .20]	.10 [−.12, .31]	.10 [−.20, .40]
Marital status				
Married or cohabiting	Ref.	Ref.	Ref.	Ref.
Widowed	−.23** [−.36, −.10]	−.16* [−.30, −.02]	−.23** [−.40, −.06]	−.63*** [−.89, −.36]
Separated/divorced	.01 [−.18, .21]	.11 [−.14, .35]	−.29 [−.64, .06]	−.35 [−.79, .08]
Never married	.06 [−.14, .26]	.13 [−.06, .32]	−.09 [−.34, .15]	−.02 [−.43, .39]
Urbanicity				
Rural	Ref.	Ref.	Ref.	Ref.
Urban	.00 [−.15, .15]	−.18 [−.38, .02]	.35** [.11, .60]	.04 [−.38, .46]

Note. Ref. = reference category; SA = successful aging; CI = confidence interval.
[a]Higher scores indicate more SA.
[b]Include no formal education received.
*$p < .05$, **$p < .01$, ***$p < .001$.

After adjusting for all covariates simultaneously, multivariate analyses confirmed the base case model results with some exceptions (Table 4). Principally, men no longer had higher scores than women in the psychosocial model. The education gradient was not as evident and was only significant in the Rowe and Khan and psychosocial models. Those with Skill Level 3 in occupation scored higher in SA compared with Skill Level 1, except for the psychosocial model in which it did not reach significance.

Figure 1 shows SA score stability between Wave 1 and Wave 2. In both the psychosocial and complete models, more individuals improved their SA level from baseline to follow-up than in the Rowe and Khan and biomedical models, in which there were more individuals worsening. Figure 1 also shows the ICC. The average correlation within individuals was poor for the psychosocial model (.37) and fair for remaining SA models (range = .44-.51). On the contrary, the average correlation within model was fair for the psychosocial model (.54) and good for remaining SA models (range = .61-.67).

Discussion

This study examined the longitudinal association between sociodemographic factors and SA and how they vary depending on the SA model considered. Our results reveal that while sociodemographic characteristics such as marital status, urbanicity, and education are the most relevant SA predictors when conceptualized using a psychosocial model, aspects such as age, sex, and occupation are the main determinants for the biomedical SA model. In contrast, both the complete and Rowe and Khan models, which include biomedical and psychosocial components, showed mixed results. To sum up, sociodemographic predictors of biomedical SA are associated with health risk factors such as male gender or precarious work, while predictors of psychosocial SA are factors associated with social networks, such as level of education and marital status. Therefore, both SA components should be addressed as complementary.

In surprising contrast to the other models, older age was not associated with worse SA when using a psychosocial model. This is in line with the cross-sectional results obtained by Perales et al. (2014). The lack of association with age is consistent with the idea that older people can do as well or sometimes even better than young people with regard to happiness or the management of social relations (Carstensen, 2006). These findings are also consistent with previous cross-sectional research in older adults living in various communities in San Diego, California, that used a definition of SA including more psychosocial than biomedical components (Montross et al., 2006).

Table 4. Multivariate Linear Regression Models Showing Associations Between Sociodemographic Variables and SA at Baseline and SA at Follow-Up Using Different SA Models.

	Rowe and Khan's model rating (0-5) at follow-up[a] β (95% CI)	Biomedical model rating (0-7) at follow-up[a] β (95% CI)	Psychosocial model rating (0-6) at follow-up[a] β (95% CI)	Complete model rating (0-15) at follow-up[a] β (95% CI)
Intercept	2.63 [2.16, 3.11]	3.31 [2.64, 3.98]	2.72 [2.04, 3.40]	7.44 [6.32, 8.55]
Sex				
Women	Ref.	Ref.	Ref.	Ref.
Men	−.05 [−.16, .06]	−.25** [−.38, −.11]	.12 [−.03, .27]	.03 [−.27, .34]
Age (in years)	−.02*** [−.03, −.02]	−.02*** [−.03, −.01]	.00 [−.01, .01]	−.03*** [−.04, −.01]
Highest education level				
College/university	Ref.	Ref.	Ref.	Ref.
Upper secondary school	−.08 [−.27, .11]	−.05 [−.33, .22]	−.10 [−.43, .24]	−.16 [−.55, .22]
Lower secondary school	−.23* [−.45, −.01]	−.02 [−.27, .23]	−.27* [−.53, −.02]	−.41 [−.84, .03]
Primary school	−.24* [−.44, −.04]	−.09 [−.31, .17]	−.19 [−.47, .09]	−.25 [−.72, .22]
Incomplete primary school[b]	−.38*** [−.59, −.17]	−.08 [−.35, .20]	−.54*** [−.82, −.25]	−.52 [−1.07, .03]
Occupation				
Skill Level 1	Ref.	Ref.	Ref.	Ref.
Skill Level 2	.20** [.06, .34]	.15 [−.01, .31]	.08 [−.12, .27]	.16 [−.12, .45]
Skill Level 3	.22* [.05, .39]	.23* [.02, .45]	.15 [−.11, .41]	.45* [.03, .87]
Never worked	.04 [−.15, .23]	.06 [−.14, .26]	.15 [−.07, .37]	.32* [.00, .65]
Marital status				
Married or cohabiting	Ref.	Ref.	Ref.	Ref.
Widowed	.03 [−.11, .16]	−.02 [−.18, .14]	−.14 [−.34, .07]	−.28 [−.58, .02]
Separated/divorced	−.05 [−.25, .14]	.07 [−.16, .31]	−.39* [−.74, −.03]	−.48* [−.90, −.06]
Never married	.01 [−.17, .18]	.10 [−.08, .28]	−.09 [−.33, .15]	−.06 [−.48, .35]
Urbanicity				
Rural	Ref.	Ref.	Ref.	Ref.
Urban	.02 [−.13, .16]	−.14 [−.34, .05]	.37** [.12, .61]	.12 [−.30, .53]
Model at baseline	.42*** [.37, .47]	.45*** [.40, .49]	.32*** [.26, .38]	.37*** [.32, .42]
Adjusted R^2	.351	.278	.185	.238

Note. Ref. = reference category; SA = successful aging; CI = confidence interval.
[a]Higher scores indicate more SA.
[b]Include no formal education received.
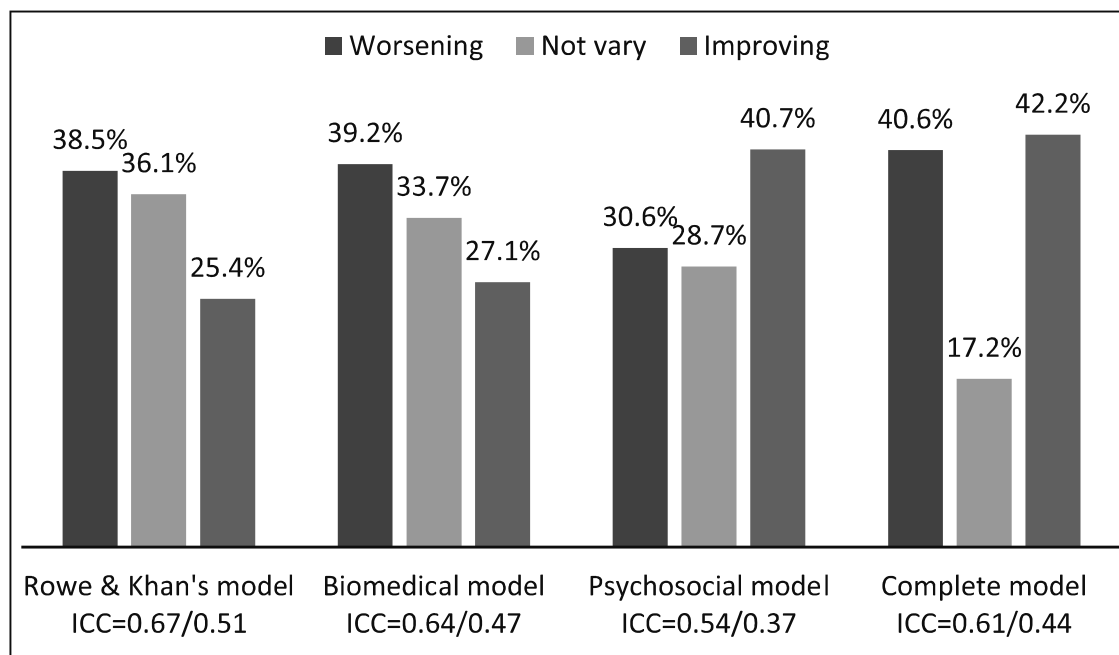*$p < .05$, **$p < .01$, ***$p < .001$.

Figure 1. Percentages of worsening, unchanged, and improving in each successful aging model.
Note. ICC for average/individual between baseline and follow-up are reported in each model. Weighted proportions are displayed. ICC = intraclass correlation coefficient.

Other studies also reinforce the evidence on the absence of a relationship between age and SA: A longitudinal study of a representative sample of older adults living in Manitoba (Canada) showed that, while older age was a predictor for cognitive or physical problems and mortality, it did not predict happiness or life satisfaction (Menec, 2003). However, a review conducted by Depp and Jeste (2006) including several studies, such as the two above-mentioned studies, found that age was a significant predictor of SA, although these studies used SA models with a high proportion of biomedical components such as physical activities (Strawbridge, Cohen, Shema, & Kaplan, 1996) or chronic diseases (Burke et al., 2001).

We found that the relationship between sex and psychosocial SA was strongly linked to marital status. Linear regression adjusted for SA model at baseline showed that being female is a predictor of lower levels of psychosocial SA compared with men. However, this relationship disappeared when adjusting for marital status. In our sample, most separated or divorced individuals were women (9.0% vs. 4.8%, $p < .001$). In addition, the harmful effects of being single on SA are stronger for men. A cross-sectional community survey of individuals aged 50 years and older in 15 European countries also found that unmarried individuals showed lower levels of psychosocial well-being but that never married and divorced women

exhibited higher odds of participation in social activities than men (Trevisan et al., 2016). Studies also demonstrate that frailty also seems to be higher among unmarried men than women (Finkel et al., 2016). In addition, we found a significantly lower level of biomedical SA for men, which could be explained by differences in life-style risk factor exposure between genders (inadequate diet, physical inactivity, and excessive alcohol and tobacco use; Varì et al., 2016). There are also specific gender differences in cardiovascular risks related to estrogens being a protector for women and abdominal obesity being more prevalent in males (Harvard Men's Health Watch, 2010).

Education and occupation, both common indicators of socioeconomic status, showed different relationships with SA depending on the model applied. In the base case model, higher levels of occupation and education were found to be predictors of higher levels of SA in all models but when both are included in a multivariate model, education was a predictor only in the psychosocial and Rowe and Khan SA models, while occupation was not a predictor in the psychosocial model. Having a higher educational level provides relational and intellectual resources throughout life and it is associated with a greater sense of control and hope, and protects against age-associated declines in psychosocial functioning (Mitchell, Ailshire, Brown, Levine, & Crimmins, 2016). A higher educational level is a significant SA predictor in models with psychosocial components such as subjective life satisfaction (Menec, 2003) or objective social support (Vaillant & Mukamal, 2001). However, the effect of occupation may be due to other mechanisms. The relationship between occupation and the biomedical SA model might be attributed to the widely recognized harmful effects of precarious work (particularly high in Spain compared with other European countries) on physical and mental health. Moreover, a lower socioeconomic position may be related to fewer resources to cope with the presence of diseases, and with living in more deprived and unsafe environments (Lynch, 2000). Finally, urbanicity was also found to be a predictor of psychosocial SA. Studies on SA have not taken this factor into account even though rural aging is a specific matter of study related to mental and physical well-being (Burholt & Dobbs, 2012).

Our findings have shown that urbanicity along with education and marital status are predictors of psychosocial SA. These factors are commonly associated with qualitative aspects of social life among the elderly such as social isolation or loneliness (Community Development Halton, 2016). These associations are also in line with the social capital theory which conceptualizes subjective well-being as being predicted by the breadth and depth of social connections. Individuals with close friends and confidants, neighbors, friends, and coworkers' support are less likely to experience sadness, loneliness, and low self-esteem (Helliwell & Putnam, 2004). Therefore, variables

that directly influence the social network are associated with better psychosocial SA.

Strengths and Limitations of the Study

The strengths of this study include the use of a large community-representative sample with older adults from a variety of socioeconomic backgrounds, the option of including several covariates, and the longitudinal design which enables us to examine causal relationships. However, we need to consider a number of limitations associated with these findings. First, about one fourth of the individuals declined to be evaluated at follow-up. This could potentially bias the results as these people may have had different SA patterns to those evaluated. Second, comparability across studies is difficult given the measurement inconsistencies among them. Third, as the present study did not have identical aims to the COURAGE in Europe project, some SA aspects (i.e., environmental fit, personal growth, etc.) were not included as part of the questionnaire. However, we did include a number of variables that are representative of the major SA components, namely biomedical, psychosocial, and external factors. Fourth, we did not include dying in our definitions of SA, which is an important factor to take into account (Cosco, Stephan, & Brayne, 2013), because it is incompatible with consideration of SA as a continuous variable. Finally, some of the variables were collected retrospectively through self-report, which may result in recall or reporting bias. Nevertheless, most epidemiological studies have used self-reported data, and recall biases are usually relatively minor (Kriegsman, Penninx, Van Eijk, Boeke, & Deeg, 1996).

Conclusion

The results of this study suggest that biomedical and psychosocial components of SA should be addressed differently given their different associations with sociodemographic factors. Results also suggest that addressing psychosocial components could lead to large SA improvements. Although several researchers have underlined the need to create social environments that foster aging well in the European Union, there is a clear tendency to reduce the costs of aging by extending working life, along with a lack of integrated social policies (Foster & Walker, 2015).

We hope that this study contributes to raising awareness of the need for more longitudinal studies of SA determinants, complemented with qualitative studies which may help to achieve a better understanding of the associations found here. Based on our findings, to overcome the limits of each

approach, a double theoretic strategy is encouraged: (a) As a precondition for a broad understanding of SA, it is necessary to establish consensus in the scientific community on the main biomedical and psychological factors, and (b) a comprehensive interdisciplinary inquiry into the role of social structures (social networks and social classes) in SA is needed.

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Declaration of Conflicting Interests

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A2.- The impact of socioeconomic status on the association between biomedical and psychosocial well-being and all-cause mortality in older Spanish adults

ORIGINAL PAPER

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The impact of socioeconomic status on the association between biomedical and psychosocial well-being and all-cause mortality in older Spanish adults

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Abstract
Purpose The aim of this paper was to analyze the effect of biomedical and psychosocial well-being, based on distinct successful aging models (SA), on time to mortality, and determine whether this effect was modified by socioeconomic status (SES) in a nationally representative sample of older Spanish adults.
Methods Data were taken from a 3-year follow-up study with 2783 participants aged 50 or over. Vital status was ascertained using national registers or asking participants' relatives. Kaplan–Meier curves were used to estimate the time to death by SES, and levels of biomedical and psychosocial SA. Cox proportional hazard regression models were conducted to explore interactions between SES and SA models while adjusting for gender, age, and marital status.
Results Lower levels of SES and biomedical and psychosocial SA were associated with low probability of survival. Only the interaction between SES and biomedical SA was significant. Biomedical SA impacted on mortality rates among individuals with low SES but not on those with medium or high SES, whereas psychosocial SA affected mortality regardless of SES.
Conclusions Promoting equal access to health care system and improved psychosocial well-being could be a protective factor against premature mortality in older Spanish adults with low SES.

Keywords Successful aging · Biomedical well-being · Psychosocial well-being · Socioeconomic status · Survival analysis · Spain

Introduction

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Socioeconomic status (SES) includes the social and economic factors that determine the hierarchical position of an individual in society [1]. SES has been demonstrated to predict all-cause mortality [2], as well as that from specific causes, such as cardiovascular disease [3] or cancer [4]. The association between SES and health or premature mortality has been explained by multiple mechanisms corresponding to certain theories: an increased risk in unhealthy life styles (behavioral); unequal access to the health care system and particular exposure to material deprivation (materialist); differing likelihood of isolation and lack of engagement in social networks (psychosocial); and damaging agents in the environment leading to illness according to SES (biomedical) [5]. In addition, life course theories propose that inequalities on health are partly attributable to the accumulation of hazard exposures [6].

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Several studies on socioeconomic differences in mortality focused on the analysis of specific psychosocial, biomedical, behavioral, and material factors as mediators in the association between SES and mortality, and obtained significant results [7–9]. Material factors were revealed as the most important mediators between SES and mortality. Among material factors, inequality in access to the health care system could explain differences in mortality among people with similar diseases and risk behaviors according to SES. This is in line with studies, showing that mortality rates from preventable diseases were found to be more strongly associated with lower SES than death from less preventable diseases [10] and other studies suggesting that the association between low SES and mortality remains after controlling for risk behaviors [2], psychological distress [11], or specific diseases such as acute myocardial infarction [12].

Less well understood are socioeconomic differences in mortality interacting with general measures of biomedical and psychosocial well-being simultaneously, despite the fact that greater understanding of this aspect could help to explain the effect of SES on mortality. Successful aging (SA) models appear as useful general indicators of biomedical and psychosocial well-being among older adults, since definitions of SA derive from biomedical and psychosocial perspectives related to the notion of "aging well" [13].

Five broad categories of SA components have recently been proposed: physiological status (physical and mental health and behavioral risk factors), commitment (social participation), well-being (satisfaction with life), personal resources (resilience and autonomy), and external factors (socioeconomic indicators) [14]. Physiological status and personal resources constitute the biomedical model, whereas commitment and well-being form the psychosocial model [15, 16]. However, external factors, such SES, are not considered in these models, even though they seem to affect all SA components [17]. SES has been associated with physical health [18], mental health [19], and psychosocial well-being [20], while psychosocial well-being has also been found to be a protective factor for health among individuals with low SES [18].

Successful aging models as predictors of mortality have been tested and have shown significant results [21]. However, the existing literature does not indicate whether biomedical and psychosocial SA predicts mortality differently according to SES. The aim of the present study was to investigate whether SES and biomedical and psychosocial models of SA significantly affect the survival of people aged 50 and over from a representative sample of Spanish older adults. We also aimed to determine whether SES moderated the effect of the SA models on the probability of survival. Based on the existing literature, we hypothesized that low SES and lower levels of biomedical and psychosocial SA would be significant predictors of mortality in a 3-year follow-up. We also expected to find that survival time among people with poor levels of biomedical SA would be shorter for those with low SES, whereas psychosocial SA could be a protective factor for mortality among these individuals.

Methods

Study design

This study was part of the Collaborative Research on Ageing in Europe (COURAGE in Europe) project [22], a longitudinal survey of the non-institutionalized adult population (≥ 18 years). In Spain, the first wave was conducted between July, 2011 and May, 2012 and the second wave between December, 2014 and June, 2015.

Initially, a total of 4753 participants were interviewed, 962 aged 18–49, 3312 aged 50–79, and 479 aged 80 and over. To achieve appropriate representation of the Spanish population, a stratified multistage clustered area probability method was used. Age cohorts 50–79 and 80 and over were oversampled, given that these individuals were the main study target. The individual response rate was 69.9% in wave 1 and 69.5% in wave 2.

Face-to-face structured interviews were carried out by lay, trained interviewers at respondents' homes using Computer-Assisted Personal Interviewing (CAPI). The survey questionnaire was originally developed in English and then translated into Spanish following World Health Organization translation guidelines for assessment instruments [23]. Quality assurance procedures were implemented during fieldwork. During wave 1, participants with severe cognitive impairment, judged at the interviewer´s discretion or based on a previous diagnosis of dementia, were not interviewed and a shorter version of the questionnaire was administered to proxy respondents.

Vital status and date of death were ascertained for all participants just before the second wave took place, using data from the National Death Index, a civil registry with data on the vital status of all residents in Spain. Vital status was also updated during the household visit in the wave 2 assessment by asking respondents' relatives. A final update was conducted on June 30th, 2015 by consulting the National Death Index.

The present analysis focused on people aged 50 or older at baseline. We also excluded those participants with missing values in one or more of the variables used at baseline, resulting in a final sample of 2783 participants. Sampling weights were used to compensate for the survey design and non-response in the follow-up assessment, so that the results were representative of the Spanish population [24].

Ethics statement

Ethical approval for the COURAGE study Spain was provided by Parc Sanitari Sant Joan de Déu, Barcelona, Spain, and Hospital la Princesa, Madrid, Spain. Written informed consent was obtained from participants.

Measurements

Control variables

Participants were asked to provide the following sociodemographic data: age, sex, household size, marital status (never married, currently married/cohabiting, separated/divorced, and widowed), and labor situation (working, retired/disabled, homemaker/unpaid work, and unemployed). Household size, marital status, and labor situation were selected as control variables, because they have previously been used by researchers to measure household income, or as confounding variables in the association between income and health outcomes among older adults [25–27].

Biomedical variables

Chronic medical conditions in the previous 12 months were based on self-report diagnoses of chronic lung disease, asthma, hypertension, arthritis, stroke, angina pectoris, and diabetes. In addition, a symptom algorithm was used to detect non-diagnosed cases of arthritis, stroke, angina, chronic lung disease, and asthma [28]. For diabetes, only a self-reported diagnosis was used. The presence of hypertension was based on self-reported diagnosis or presence of systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHg [28, 29]. The 12-item interviewer-administered version of the World Health Organization disability assessment schedule version II (WHODAS-II) [30] was used to assess disability. Participants were asked to report the level of difficulty which they had in performing various activities such as dressing or concentrating during the previous 30 days using a five-point scale (none $= 1$, mild $= 2$, moderate $= 3$, severe $= 4$, and extreme/cannot do $= 5$). The total score ranges from 0 to 100 with higher scores indicating greater disability.

An adapted version of the Composite International Diagnostic Interview (CIDI 3.0) was used to assess the presence of depression in the previous 12 months [31]. An algorithm based on the fourth edition of the diagnostic and statistical manual of mental disorders was used [32]. Cognitive functioning was assessed using five performance tests measuring three domains: learning and short-term memory, working memory, and verbal fluency. A composite of these five scores was calculated [33]. The total score ranges from 0 to 100 with higher scores indicating better cognition.

Tobacco consumption was assessed by asking whether participants were daily smokers, non-daily smokers, former smokers, or had never smoked. Alcohol consumption was assessed by asking whether participants were lifetime abstainers, and if not, the pattern of alcohol consumption in the previous week. They were then classified as lifetime abstainers; occasional drinkers (no consumption in previous 7 days); non-heavy drinkers (consumed alcohol in previous 7 days); and heavy drinkers (consumed alcohol > 1–2 days per week, with 5 or more standard drinks in past 7 days for men and 4 or more for women).

Physical activity was measured using the Global Physical Activity Questionnaire [34]. Three categories were created to indicate levels of physical activity [35]: (a) High (including vigorous activity on at least 3 days, representing a minimum of at least 1500 MET-minutes per week or 7 or more days of any combination of walking, moderate, or vigorous activities representing a minimum of at least 3000 MET-minutes per week); (b) Moderate (3 or more days of vigorous activity for at least 20 min per day or 5 or more days of moderate activity or walking for at least 30 min per day or 5 or more days of any combination of walking, moderate, or vigorous activities reaching a minimum of 600 MET-minutes per week); and (c) Low (a person not meeting any of the above-mentioned criteria).

Psychosocial variables

Social participation was measured using 11, five-point Likert scale questions ranging from never to daily on how often in the previous 12 months the person had participated in activities such as attendance at public meetings, meetings with community leaders or at any group or organizational meeting, visiting sport clubs, taking part in competitions or doing sport with someone else, working with people from the neighborhood to fix or improve something, having friends over, visiting or hosting someone who lives in a different neighborhood, and getting out to take part in social meetings. Social contacts were measured using 10, five-point Likert scale questions ranging from never to daily on how often in the previous 12 months the person had had contact with other people such as their partner, children, or neighbors.

Social support was measured using the Oslo social support scale [36]. This scale consists of three items: "How many people are you so close to that you can count on them if you have great personal problems? [from none (1) to more than five (4)]", "How much interest and concern do people show in what you do? [from a lot (1) to none (5)]", and "How easy is it to get practical help from neighbors if you should need it? [from very easy (1) to very difficult (5)]". A composite score was calculated as the sum of the three items, ranging from 3 to 14. Due to its high skewness, the

median of the sample was used to categorize people into low (< 12) or high social support (≥ 12) [15]. Self-rated quality of life was measured with a single five-point Likert scale question with responses on a range from very good to very bad. Control and coping were measured using a five-point Likert scale question with responses ranging from never to very often on how frequently in the previous 2 weeks the participants had been unable to control important things in their lives and to cope with things they had to do.

SA models

The indicators used for the construction of the distinct SA models were selected on the basis of previous literature [14, 37, 38] and their operationalization has previously been reported [15]. Specifically, the following models and indicators were considered: (i) biomedical: requiring no presence of any chronic medical conditions, a score below the median on the WHODAS-II (i.e., from 0 to 3), a value equal to or above the median in the cognition composite score (i.e., from 51 to 100), no presence of depression in the previous 12 months, not being a current smoker, being an occasional drinker or lifetime abstainer and being engaged in moderate or high physical activity. Biomedical SA scores can range from 0 to 7; (ii) psychosocial: requiring engagement in three or more separate social activities at least once a month, three or more social contacts with at least 1 month of frequency, a score ranging from 12 to 14 (90th percentile) on the Oslo social support scale, good or very good self-reported quality of life, never or almost never unable to control important things in life, and never or almost never unable to cope with things they have to do. Psychosocial SA scores range from 0 to 6. In both cases, higher scores indicate better SA.

Socioeconomic status

SES has traditionally been determined through information on education, occupation, and household income [39, 40]. However, there was a large number of participants in our study who were retired (39.8%), and thus, we opted for a resource-based measure of SES (including measures of educational attainment, total family income, labor market earnings, wealth, and SES composite scores) rather than an occupational prestige-based measure [39, 40]. An SES index based on education and household income has also previously been used as a proxy for individual location in occupational structure [41].

SES was calculated by taking into account the total number of years of education (0–22) and the quintiles of household income level (1–5) [42]. These two variables were multiplied to create scores from 0 to 55 and totaled to obtain combined scores ranging from 0 to 110, which were then categorized as 'low', 'medium', and 'high' using tertiles as

cut-off points. It is not unusual in the quantification of SES for only two of its components to be combined depending on the age group of the participants [43, 44].

Statistical analysis

Unweighted frequencies and means were used for descriptive analyses. Deceased and living participants were compared using the Rao–Scott χ^2 test for categorical variables and one-way ANOVA test for continuous variables.

Mortality was the outcome for these analyses. Kaplan–Meier survival curves were used to estimate the time to death (from the first interview). Participants who were alive at the end of the observational period (30th of June 2015) were censored. Graphics showed the time to death by levels of SES, biomedical and psychosocial SA, and the differences between distinct categories were tested using the log-rank test.

Cox proportional hazards regression models were conducted to explore the interactions between biomedical SA and SES, and psychosocial SA and SES. These models were further adjusted for control variables. Only the interaction between biomedical SA and SES reached significance ($p < 0.05$) and it was, therefore, included in the adjusted model to estimate the effect of SES on all-cause mortality. Finally, Kaplan–Meier survival curves were used to estimate the time to death depending on biomedical levels stratified by SES.

SA models were operationalized as continuous variables for the regression models, whereas the scores were categorized in quartiles for Kaplan–Meier survival curves. All analyses were performed using Stata version 13 for Windows (SE version 13, College Station, TX) taking into account the complex sampling design. Weights were used to adjust for differential probabilities of selection within households, and post-stratification corrections to the weights were made to match the samples to the sociodemographic distributions of the Spanish population. Statistical significance was set at $p < 0.05$.

Results

Table 1 shows the baseline characteristics of the total sample and the participants who died or remained alive during the follow-up. A total of 139 (4.9%) of the 2783 participants had died by the end of the follow-up. Females accounted for 54.6% of the whole sample and the mean age was 66.4 years (95% CI 65.8, 67.0). There were significant differences between deceased and living participants in terms of sociodemographic variables and psychosocial and biomedical successful aging measures. Deceased participants were more likely to be men, retired or disabled, living alone, widowed

Table 1 Baseline characteristics of the sample and comparison between deceased and alive participants at the end of the follow-up

	Total sample (N=2783)	Deceased participants (n=138)	Participants alive (n=2645)	p value
Age, mean (95% CI)	66.4 (65.8, 67.0)	75.5 (73.2, 77.9)	65.9 (65.3, 66.5)	<0.001
Sex, n (%)				
Males	1253 (46.0)	86 (62.8)	1167 (45.1)	<0.001
Females	1530 (54.0)	52 (37.2)	1478 (54.9)	
Marital status, n (%)				
Single	234 (8.4)	10 (5.8)	224 (8.6)	0.019
Married/cohabiting	1715 (62.0)	72 (53.0)	1643 (62.5)	
Separated/divorced	215 (7.4)	13 (7.9)	202 (7.4)	
Widowed	619 (22.2)	43 (33.3)	576 (21.5)	
Labor situation, n (%)				
Working	676 (23.9)	8 (6.8)	668 (24.8)	<0.001
Retired/disabled	1257 (46.2)	101 (72.0)	1156 (44.7)	
Homemaker/unpaid work	640 (22.3)	27 (19.2)	613 (22.5)	
Unemployed	210 (7.7)	2 (2.0)	208 (8.0)	
Socioeconomic status, n (%)				
Low	892 (33.3)	61 (40.5)	831 (32.8)	0.076
Medium	946 (34.1)	49 (37.3)	897 (33.9)	
High	945 (32.6)	28 (22.2)	917 (33.2)	
Household size, mean (95% CI)	2.38 (2.29, 2.46)	2.03 (1.84, 2.22)	2.40 (2.31, 2.49)	<0.001
Biomedical SA, mean (95% CI)	3.59 (3.49, 3.68)	3.12 (2.91, 3.32)	3.61 (3.52, 3.71)	<0.001
Psychosocial SA, mean (95%CI)	4.06 (3.96, 4.16)	3.67 (3.43, 3.90)	4.08 (3.98, 4.18)	<0.001

95% CI 95% confidence interval, *SA* successful aging, Unweighted frequencies, weighted proportions, and means. In Biomedical SA (scale from 0 to 7) or Psychosocial SA (scale from 0 to 6) higher scores mean better SA

and with lower means in biomedical and psychosocial SA scores. However, there were no significant differences between the deceased and the living in terms of SES.

Table 2 shows unadjusted and adjusted Cox proportional regression models. In the unadjusted model, similar results to those obtained in descriptive analysis were found, although greater likelihood of survival was significantly associated with high SES. Before performing the adjusted model shown in Table 2, we observed that the biomedical SA×SES interaction term was significant ($p=0.046$). Thus, the significant interaction was included in the final adjusted model. People who had lower levels of psychosocial SA were more prone to die, independently of other covariates, whereas the impact of biomedical SA on mortality depended on SES as indicated by the significant interaction. Additional adjusted models were run separately for people with high ($n=892$), medium ($n=945$), and low ($n=946$) SES (data not shown) according to which biomedical SA impacted on time to death among people with low SES (HR=0.6, 95% CI 0.50, 0.89 $p<0.05$) but not among those with medium (HR=1.03, 95% CI 0.84, 1.27 $p>0.05$) or high (HR=0.90, 95% CI 0.64, 1.26 $p>0.05$) SES.

The adjusted Cox proportional regression model also showed that, after adjusting by SES and remaining covariates, marital status showed a significant effect on mortality in which separated and divorced individuals have a greater likelihood of mortality, whereas a significant effect of labor situation and household size on mortality was not found. In the Kaplan–Meier analysis, lower levels of SES and biomedical and psychosocial SA were found to have a significant negative effect on survival (Fig. 1). Figure 2 shows the survival curves as a function of biomedical SA stratified by SES levels. The probability of surviving to the end of the study was significantly lower among people with the lowest levels of SES and biomedical SA. Among people with medium SES, being in the second quartile of biomedical SA was related to a significantly lower probability of remaining alive, whereas in the high SES level, there were no significant differences between participants with distinct levels of biomedical SA in terms of survival.

Discussion

To the best of our knowledge, the present study is the first to compare the ability to predict mortality between biomedical and psychosocial well-being through successful aging (SA) models, and how socioeconomic status (SES) modifies

Table 2 Unadjusted and adjusted Cox proportional regression models in the total sample ($N = 2783$)

Predictor	Unadjusted HR (95% CI)	Adjusted HR (95% CI)
Age	**1.09 (1.06, 1.11)*****	**1.08 (1.06, 1.11)*****
Sex		
Male	Ref	Ref
Female	**0.50 (0.33, 0.74)*****	**0.34 (0.21, 0.54)*****
Marital status		
Single	Ref	Ref
Married/cohabiting	1.25 (0.55, 2.82)	0.99 (0.41, 2.36)
Separated/divorced	1.56 (0.57, 4.28)	**2.73 (1.00, 7.40)***
Widowed	**2.23 (1.03, 4.86)***	1.23 (0.58, 2.60)
Labor situation		
Working	Ref	Ref
Retired/disabled	**5.68 (2.15, 15.0)****	1.53 (0.62, 3.76)
Homemaker/unpaid work	**3.05 (1.03, 9.02)***	1.71 (0.60, 4.84)
Unemployed	0.90 (0.15, 5.27)	0.89 (0.15, 5.15)
Socioeconomic status (SES)		
Low	Ref	Ref
Medium	0.89 (0.57, 1.39)	**0.30 (0.10, 0.88)***
High	**0.55 (0.34, 0.90)***	0.34 (0.69, 1.62)
Household size	**0.74 (0.61, 0.89)****	0.97 (0.83, 1.14)
Biomedical SA	**0.72 (0.62, 0.83)*****	**0.66 (0.49, 0.87)****
Psychosocial SA	**0.83 (0.74, 0.92)****	**0.84 (0.73, 0.95)****
Biomedical SA × SES		
Low	–	Ref
Medium	–	**1.54 (1.08, 2.20)***
High	–	1.40 (0.88, 2.23)

HR Hazard ratio, *95% CI* 95% confidence interval, *SA* successful aging, *Ref* reference category, *SES* socioeconomic status. In bold, significant HR

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

those predictions. Our results show that psychosocial and biomedical well-being as well as SES predict mortality over 3-year of follow-up in a representative sample of older people (aged 50 years and older) in Spain after adjusting for multiple covariates. In the case of the biomedical model, the association was modified by SES. Our results confirm the hypothesis that having lower levels of SA, according to a biomedical model, is related to significantly shorter survival time than older adults with higher SA only when their SES is low, whereas SA, according to the psychosocial model, is related to survival but is not modified by SES levels.

The association between lower SES and biomedical factors, such as poorer physical and mental health, has been explained through multiple specific factors from material, psychosocial, behavioral, and biomedical theories. For instance, debt has been found to be one of the major risk factors for common mental disorders [45], job loss has been associated with increased depressive symptoms in the United States and Europe [46], permanent income shocks lead to poorer health behavior [47], and income inequality is closely related to poor health status as increased

social inequalities accentuate SES differences [48]. However, these factors would explain the association between lower SES and higher ratios of mortality [2] but not why the effect of biomedical well-being in older adults on time to death differs according to their SES levels.

Our findings suggest that socioeconomically advantaged older Spanish adults are more likely to survive despite not meeting all the criteria for SA. Differences in access to healthcare according to SES could explain these results [5]. Inequalities in health access could have been exacerbated by the recent financial crisis in Europe and subsequent austerity policies. Although Spain has universal health coverage, a recent study on the impact of the financial crisis on health care systems in three European countries (UK, Germany, and Spain) showed that Spain was the country most heavily affected by this crisis, as there have been more drastic cuts along with increases in copayment, exclusion from coverage, and cuts in staff expenditure [49]. Countries such as Greece, Spain, and Portugal adopted strict fiscal austerity measures and their economies continue to shrink, placing further strain on
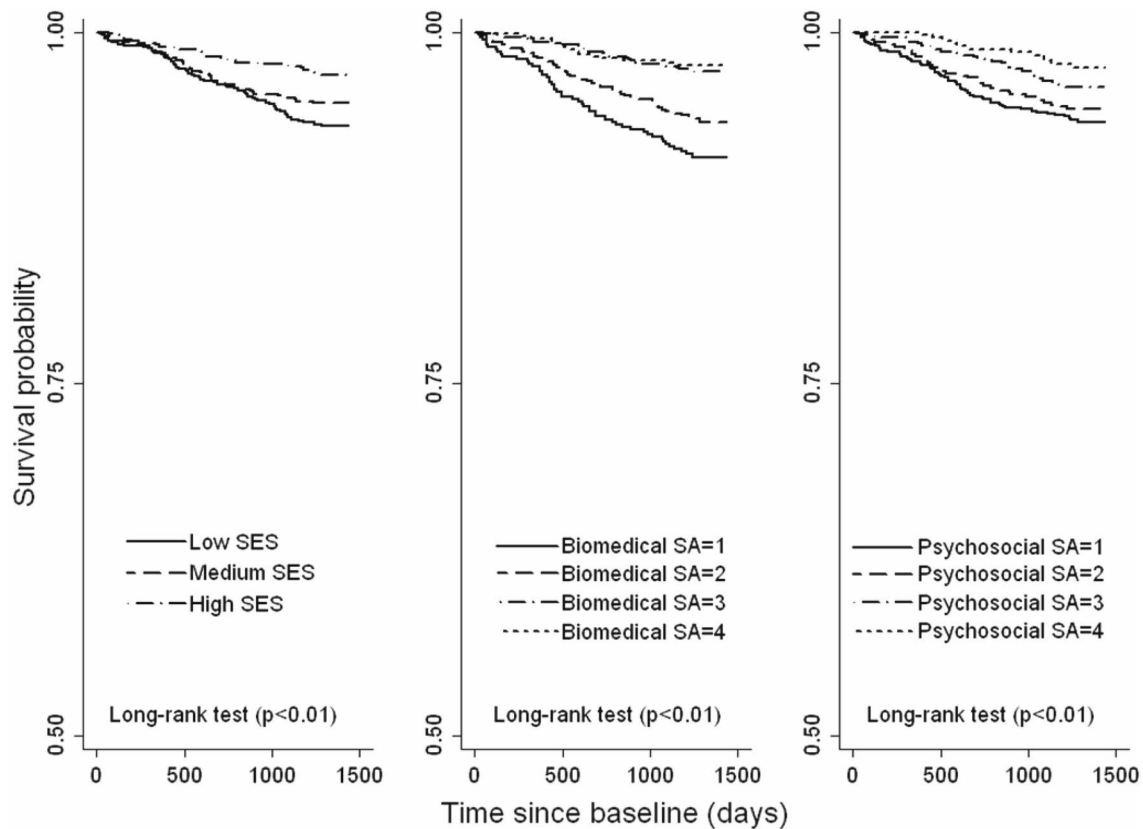
Fig. 1 Kaplan–Meier estimated curves by biomedical SA, psychosocial SA and socioeconomic status (SES). *Note SA* successful aging. SA models scores are grouped in quartiles. Higher quartiles mean better SA

their healthcare systems, while suicides and infectious diseases become more common [50].

Exclusion from health service coverage could also explain how the uninsured is at greater risk of suffering medical injury due to substandard medical care [51]. Among the elderly in Spain, these differences in access to health services by SES were confirmed by a cross-sectional study in two phases (2006–2012) showing a decrease in the use of health services. The same study also found that older adults with low SES used primary care services more often, whereas the utilization of specialized care was greater among the elderly with high SES levels [52].

In contrast, we found that SES does not modify the impact of psychosocial well-being on mortality. Conversely, a previous study on the association between SES and health showed that psychosocial factors could be a protective factor for physical illness among people with low SES [18]. There is also evidence that poor neighborhoods have a higher incidence of health problems [53], although research suggests that the beneficial effects of social capital on mental health are stronger in vulnerable neighborhoods [54]. However, our results suggest that psychosocial factors would be protective against premature death in all social strata, irrespective of

their SES level. Similarly, the previous research has shown that high social support can increase survival of chronically ill older adults [55], showing the value of improving social connections as part of potential treatment programs for the elderly.

Study strengths and limitations

Strengths of this study include the use of a large nationally representative sample of older adults with a heterogeneous socioeconomic background, the inclusion of covariates, and the longitudinal design that enables us to examine time relationships. However, we need to consider several limitations associated with these findings. First, comparability across studies is difficult given the measurement inconsistencies among them. Second, SES information was missing in about 15% of participants. Results might have been different if these people had been included in the analysis. However, we did not find significant sociodemographic differences between those included or excluded. Third, some of the variables were collected retrospectively through self-report, which may result in recall or reporting bias, although it should be pointed out that most epidemiological studies
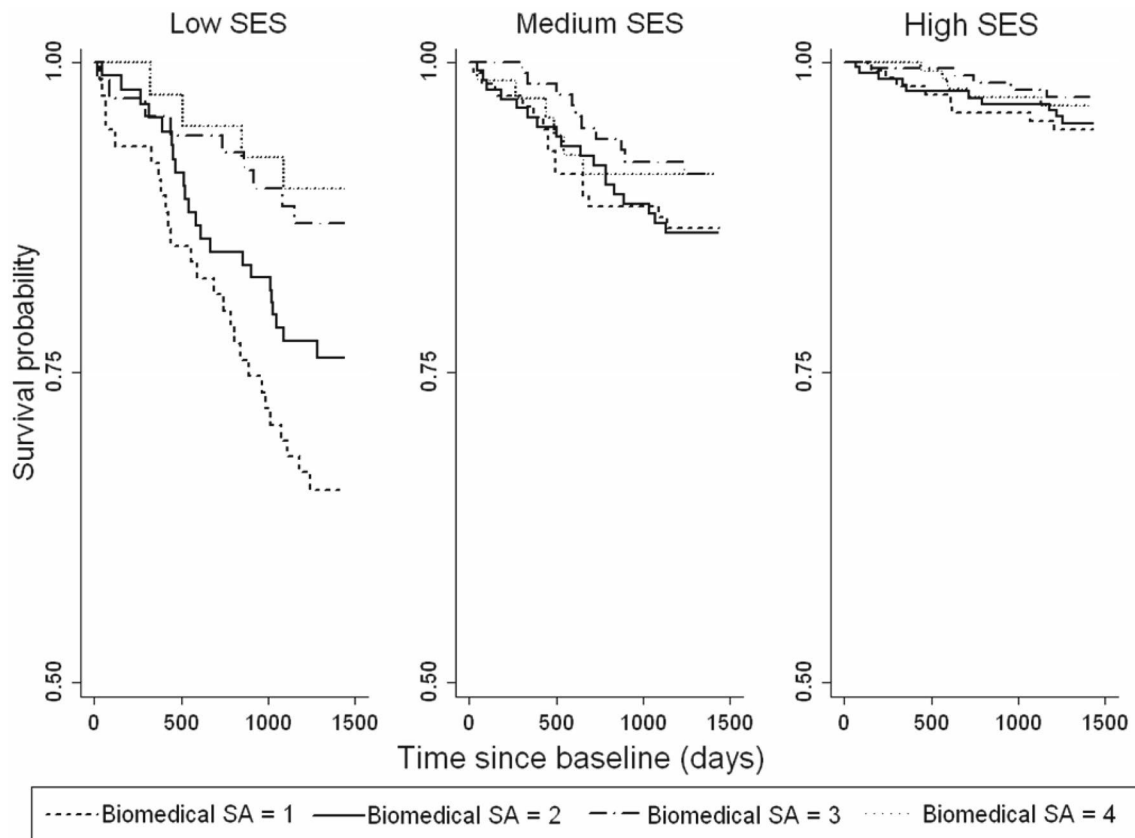
Fig. 2 Kaplan–Meier survival curves for participants with low (n = 892), medium (n = 946), and high (n = 945) socioeconomic status (SES). *Note* adjusted for age, gender, marital status, labor situation, and psychosocial SA. Reference categories (male, single, and work-ing) were used for categorical covariates, and the mean for continuous variables (age, household size, and psychosocial SA). *SA* Successful aging. Biomedical SA scores are grouped in quartiles. Higher quartiles mean better SA

have used self-reported data, and recall biases are usually considered minor [56]. Fourth, educational level and household income could have been used independently in the adjusted models. However, the use of composites scores may enhance the adjustment of measurement errors and the estimation of causal effects [57]. Finally, the follow-up period was short and results could vary with a longer follow-up. Moreover, it is possible that poor health status prior to the survey leads to low levels of income, or that the alleged relationship between SES and mortality is confounded by some unobserved factors. Future studies in different settings and countries are needed to replicate our findings on the role of socioeconomic conditions on the well-being of older people.

Conclusions

The results of this study suggest that both biomedical and psychosocial well-being affect mortality in older adults and, therefore, they should be addressed as complementary. People with low SES are especially vulnerable to mortality if suffering from poor health status, whereas having a high SES might buffer this effect. Therefore, policies designed to close the social inequality gap would have an enormous impact on the quality of life and survival of older people. Our findings also suggest that improvement of social life among the elderly would contribute to improving life expectancy in general, regardless of the socioeconomic position.

The adoption of austerity policies in response to the financial crisis affecting Europe, and especially countries such as Ireland, Greece, Portugal, and Spain, is increasing inequalities in access to healthcare systems [58]. In the case of Spain, the recent implementation of reforms in the health system, such as the introduction of co-payments [59], might aggravate this situation. Future studies should specifically address the real impact of these policies on health, especially among the most disadvantaged classes.

Compliance with ethical standards

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

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