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# Impact of Cohabitation during Confinement on Older Adults' Negative Affect: What Specificity of Life as a Couple?

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## Abstract

**BACKGROUND:** Social isolation is a risk factor for older adults' physical and psychological health. The beneficial effect of social connections in times of major health events is undeniable. Nevertheless, it remains unclear whether the positive effect of social support depends on the relationship type.

**OBJECTIVES:** This study aimed to investigate the influence of older adults' living conditions on the risk of experiencing negative affect during the first lockdown and post-lockdown.

**DESIGN:** An epidemiological study conducted during the COVID-19 crisis, at the time of the first lockdown, and 2 to 3 months following the lockdown.

**SETTING:** A subset sample of the PACOVID survey, a population-based survey of older adults. **Participants:** Altogether, 277 participants were included into three groups depending on their living conditions: Group 1 "living alone" (n = 141); Group 2 "living with their spouse" (n = 106); Group 3 "living in cohabitation with relatives" (n = 30). **Measurements:** Mixed logistic regression analyses were used to study the change in the risk of experiencing negative affects over time according to the living conditions. The presence of negative affects during lockdown was assessed using three items from the 20-item Center for Epidemiologic Studies Depression Scale: «Do you feel sad?»; «Do you feel depressed?»; «Do you feel lonely?»

**RESULTS:** Participants living with their relatives or partner were significantly less likely to experience negative affect than those living alone during lockdown. Moreover, over time, only those living with their spouse had this lesser risk compared to those living alone.

**CONCLUSIONS:** These findings highlight the protective effect of social support over time and more specifically of that provided by the spouse. Couple functioning ought to be given consideration when studying the impact of health crisis situation on the mental health of older adults.

*Key words: Mental health, COVID-19, living conditions, couple, older adults.*

## Introduction

Scientific studies in the past 20 years demonstrate that social isolation is a risk factor for older adults' physical (1-4) and psychological health (5-7). The feeling of loneliness resulting from social isolation increases the risk of anxiety and depression (7, 8). In contrast, older adults who feel supported by their spouses, family, or close friends benefit from a protective effect on mental health, and a decreased risk of depression and anxiety (8-10).

Among older adults, the deleterious effect of social isolation and loneliness occurs regardless of health status or life conditions (11-13). Therefore, lockdown periods related to specific pathologies or pandemics are critical periods. Vrach & Tomar (14) summarize the results of several studies examining the negative impact of lockdown on mental health in various contexts, such as during the SARS and H1N1 virus crisis, or in situations involving *Staphylococcus aureus* infections and tuberculosis. These periods of lockdown are associated with an increased risk of negative emotions and mental disorders, including a feeling of loneliness and abandonment, stress, anxiety, or depression (15, 16). In the context of the COVID-19 pandemic, such an impact is strengthened for people who live alone, are divorced, and/or suffer from a low level of perceived social support (17, 18), including older adults (19-21). Concurrently, older adults who feel supported and cared for experience a lesser risk of negative consequence on their mental health (22, 23).

The beneficial effect of social connections in times of major health events is undeniable. Nevertheless, it remains unclear whether the positive effect of social support depends on the relationship type. The current literature does not provide a clear comprehension of whether the beneficial effect is attributable to the couple's relationship or, more broadly, to the fact of not living alone. While studies have investigated the composition of the social network during lockdowns (24), or the importance of social support (14, 25, 26), to the best of our knowledge none differentiates between "cohabiting with relatives" and "cohabiting with a spouse" Yet, the question of living conditions is an important one when studying older adults' mental health. According to Carstensen et al. (27), with advancing age, the spouse becomes a major source of psychological support (28), probably due to the long-term shared environment and co-constructed life. While the dyadic functioning allows for a better psychological adjustment between spouses facing health issues (29-31), there is less evidence for the same process between older people and their relatives. Consequently, during the COVID outbreak and in particular during the lockdown and post-lockdown periods, people who live with their relatives (vs. alone) should be less likely to experience negative affect. Specifically, we assume that older adults living with relatives, and especially with a spouse, are less likely to experience negative affect than those living alone.

This prediction is probably understudied due to methodological difficulties. Such a study requires processing longitudinal data on health collected before, during, and shortly after the lockdown period. It is also necessary that the data be collected consistently and at simultaneously for all participants whatever their living conditions. To that end, we conduct a study using data collected in the PACOVID survey. The survey was conducted during the first lockdown and followed up 2-3 months later. Six hundred and seventy-seven participants were recruited from the PAQUID, Three Cities, and AMI cohort studies. Using mixed-effect logistic regression models, we intend to show to what extent living alone, with a spouse, or with family members impacts the risk of experiencing negative affect during lockdown and post-lockdown periods.

## Methods

### Study population

The present study relies on a subset sample from the PACOVID population-based survey (32), which was conducted during the COVID-19 crisis, at the time of the first lockdown, and 2 to 3 months following the lockdown.

Participants were recruited among samples of older adults already followed in three epidemiological cohort studies focused on aging: PAQUID (33), Three-City (34) and AMI cohort studies (35). In these three cohort studies, participants aged 65 and over were included and followed up every 2 to 3 years. The PAQUID participants have been followed since 1988, those in the 3C cohort since 1999, and those in the AMI cohort since 2007. Participants in the 3C cohort study reside mainly in urban areas while those in the AMI cohort reside in rural areas. The data collection includes measures of medical, physical, social, cognitive and psychological health status. Ethical Committees have approved these studies.

The PACOVID survey included 677 residing in Gironde. Trained psychologists contacted them by telephone during the first lockdown (between March 11 and May 16, 2021), and then 2 to 3 months later. The follow-up questionnaire was specific to the COVID pandemic and lockdown context. If the participant could not be reached, the psychologist contacted a relative or the institution health professionals. The data collected during this interview included: living conditions during the lockdown; coping strategies; mental health; health status; functional status; social support; use of digital tools; knowledge about the COVID-19 and the pandemic and knowledge about the recommendations and policy (for the detailed procedure of the PACOVID survey, see Amieva et al. (34) and Hernández-Ruiz et al. (36)).

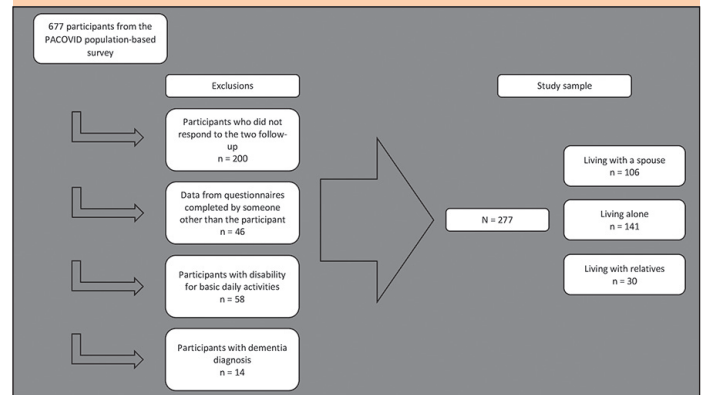
### Current study sample

In order to make participants living alone, with a spouse, or with a family as comparable as possible, we excluded data from participants who did not respond to one of the two-follow-up survey (n=200). We also excluded data from questionnaires completed by someone other than the participant (relatives

or health professionals) (n=46). Finally, to study the risk of experiencing negative affect during the lockdown and post-lockdown, we excluded participants with major comorbidities (as these could influence their experience of the situation): data from participants with disability for basic daily activities (n=58) and with dementia (n=14) (see flow-chart on figure 1). Finally, the present study based on a sample of 277 participants.

Compared to this present sample, the excluded participants were older ( $p < .001$ ), less educated ( $p < .001$ ), and lived more frequently in rural areas ( $p < .01$ ). However, they did not differ in terms of gender (n.s.) and comorbidity (n.s.).

**Figure 1.** Flow chart of the study



## Measures

### Predictors

The three groups «living alone» vs. «cohabiting with relatives» vs. «cohabiting with a spouse» were formed from participants' responses to the question of whether during lockdown they were living alone, with their spouse and/or with relatives or family members.

### Outcome

The presence of negative affects during lockdown was assessed using three items from the 20-item Center for Epidemiologic Studies Depression Scale (37): «Do you feel sad?»; «Do you feel depressed?»; «Do you feel lonely? ». The two first items were selected as they reflect the main DSM5 diagnostic criteria (38): “depressed mood”. The third item related to loneliness feeling was selected because of its strong association with psychological distress, beyond real isolation. Participants responded using the following Likert scale: 0 = rarely or never; 1 = occasionally; 2 = often; 3 = most or always. The score for each item was then dichotomized. Because older adults tend to minimize their negative emotions, which makes it difficult to detect depressive symptoms in this population (39, 40), we recoded their responses into a binary score (0 = 0 vs. 1 = (1 or 2 or 3)). Finally, to strengthen the ability to detect negative emotions, we combined the score for the 3 negative affect items as followed: absence of depression symptom = 0 vs. presence of at least one of the 3 symptoms of depression = 1.

**Table 1.** Main sociodemographic and clinical health characteristics of the participants at the time of the first lockdown (T1) and intergroups comparisons - n = 277

Living conditions	Living with a spouse n = 106	Living alone n = 141	Living with relatives n = 30	Intergroups comparisons p-value
Age, mean (SD)	85.54 (4.71)	88.82 (4.42)	88.00 (5.27)	4.44e-07*
Gender, % of women	28.3	81.6	66.7	2.35e-16*
Educational level, % no diploma or elementary level education	36.8	46.8	43.3	n.s.
Living in rural area, %	50.9	31.9	30.0	0.005*
Disability for at least one IADL, %	23.8	41.7	50.0	0.003*
MMSE, mean (SD)	27.15 (1.93)	27.12 (2.2)	26.9 (2.28)	n.s.
At least one comorbidity, %	56.6	58.9	63.3	n.s.
Poor perceived health, %	32.1	43.9	40.0	n.s.

Note: Intergroup comparisons were performed using Chi2 tests or Fisher's exact test for categorical variables and mean comparison for continuous variables; \*=significativity at  $p < .05$ ; IADL: Instrumental Activities of Daily Living; MMSE: Mini Mental State Examination

### Covariates

Sociodemographic variables included age, sex, educational level classified in two categories (no education to short secondary level not validated by a diploma vs. higher level of education) and rural vs. urban living area.

General health status variables included the presence of at least one comorbidity among the following diseases: diabetes, hypertension, stroke, heart failure, cancer, and respiratory diseases; the presence of a disability in one of the following five instrumental activities of daily living (IADL) from the Lawton and Brody's scale (41): telephone use, medication management, household finances, shopping, transportation; the global cognitive performance assessed by the Mini Mental State Examination (MMSE) (42) and the perceived health coded 1 for rather bad perceived health and 0 for good or very good perceived health.

### Statistical methods

Descriptive analyses were performed using frequencies and percentages for categorical variables and means and standard deviations for continuous variables. Intergroup comparisons were performed with Chi2 tests or Fisher's exact test for categorical variables, and mean comparisons for continuous variables. Finally, cross-sectional analyses of simple and multiple logistic regressions were used to assess the risk of experiencing negative affects during lockdown as a function of participants' living conditions.

Then, the change in the risk of experiencing negative affects over time as a function of the participants' living conditions was examined using mixed-effects logistic regression. This regression model allows to take into account three levels of nested data as well as the influence of potential covariates: the temporal level inherent to repeated outcome in time and the inter-group level which allows to compare participants according to their living conditions. To directly compare the risk of experiencing negative affect over time and between the three groups, an interaction between the measurement time and the participants' living conditions was introduced into the model. We used data collected at 3 distinct time

points: at the last cohort follow-up before lockdown (T0), at the time of lockdown (T1), and 2 to 3 months after lockdown (T2). The analysis model examines the change in the risk of experiencing negative affects over time for participants living alone, compared to those cohabiting with relatives and those living in couples.

Finally, covariates selection was performed using the top-down stepwise method by entering variables for which there were significant differences between groups.

Analyses were conducted using R version 4.1.1.

## Results

### Sample characteristics

The present study included 277 participants divided into three groups depending on their living conditions: Group 1 "living alone" consisted of 141 participants; Group 2 "living with their spouse" consisted of 106 participants and Group 3 "living in cohabitation with relatives" consisted of 30 participants. Groups description is presented in Table 1. Regarding the sociodemographic characteristics, Group 1 had an average age of 88.82 years (SD = 4.42). Among them, 81.6% were women, 46.8% had no education to short secondary education and 31.9% lived in rural area. Group 2 had an average age of 85.54 years (SD = 4.71), included 28.3% of women, 36.8% of persons without education or with short secondary education and 50.9% people lived in rural area. In Group 3, the average age was 88.00 (SD = 5.27), 66.7% were women, 43.3% had no education to short secondary education and 30.0% lived in rural area.

Regarding their health characteristics, 41.7% participants in Group 1 were dependent on at least one IADL, their average MMSE score was 27.12 (SD = 2.2); 58.9% had at least one comorbidity. In Group 2, 23.8% were dependent on at least one IADL, their average MMSE score was 27.15 (SD = 1.93) and 56.6% had at least 1 comorbidity. In Group 3, 63.3% were dependent on at least one IADL, their average MMSE score was 26.9 (SD = 2.28) and 63.3% had at least 1 comorbidity.

In terms of differences, participants living with a spouse



**Table 2.** Simple and multiple logistic regression models: risk of experiencing negative affects (feeling of sadness, depression or loneliness) during lockdown (T1) associated with the participants' living conditions, n = 277

	Simple logistic regression			Multiple logistic regression adjusted for age, gender, disability for at least one IADL, living in rural area		
	OR	CI 2.5%-97.5%	p-value	OR	CI 2.5%-97.5%	p-value
Living with relatives vs. alone	0.40	0.17-0.90	0.03*	0.40	0.17-0.92	0.03*
Living in couple vs. alone	0.17	0.10-0.29	< 0.001*	0.17	0.09-0.33	< 0.001*

\*=significativity at p < .05; IADL: Instrumental Activities of Daily Living

**Table 3.** Mixed logistic regression models: risk of experiencing negative affects over time depending the living conditions

	Simple mixed-logistic model without adjustment			After adjustment on age, gender, disability for at least one IADL, living in rural area		
	OR	CI 2.5%-97.5%	p-value	OR	CI 2.5%-97.5%	p-value
Intercept	0.84	0.49 - 1.41	0.50	0.002	1.7e-12 - 2.05	0.08
<b>Living conditions</b>						
1. Living with relatives vs. alone	0.27	0.05 - 1.32	0.10	0.29	0.06 - 1.40	0.12
2. Living in couple vs. alone	0.18	0.08 - 0.39	< .001*	0.24	0.01 - 0.55	< .001*
<b>Follow-up</b>						
T1 vs. T0	2.53	1.34 - 4.78	0.004*	2.39	1.27 - 4.50	0.007**
T2 vs. T0	1.04	0.54 - 1.98	0.91	1.04	0.54 - 1.99	0.90
Living condition 1 x T1	1.03	0.17 - 6.25	0.98	1.00	0.17 - 5.97	0.99
Living condition 2 x T1	0.23	0.08 - 0.63	0.005**	0.25	0.09 - 0.68	0.007**
Living condition 1 x T2	0.93	0.13 - 6.26	0.94	0.84	0.13 - 5.63	0.85
Living condition 2 x T2	0.28	0.09 - 0.88	0.03*	0.29	0.09 - 0.89	0.03*

\*=significativity at p < .05; \*\*=significativity at p < .01; IADL: Instrumental Activities of Daily Living; T0: the last cohort follow-up before the lockdown; T1: lockdown follow-up; T2: post-lockdown follow-up

were significantly younger (p < .001), more likely to be female (p < .001), to have fewer IADLs (p < .01), and to live in rural areas (p < .01), than those living alone or with relatives. There was no difference between the three groups in terms of education, MMSE score and presence of comorbidity.

Regarding negative affect during lockdown, participants living alone felt sad, lonely and/or depressed more frequently than people cohabiting with relatives (73% vs. 51.7%; p < .05) and living with a spouse (73% vs. 31.4%; p < .001). Participants cohabiting with relatives felt sad, lonely and/or depressed more frequently than participants living with a spouse (51.7% vs. 31.4%; p < .05).

***Risk of experiencing negative affect depending on living conditions during lockdown***

The results of simple and multiple logistic regressions at the time of lockdown (T1) are presented in Table 2.

The multiple logistic regressions models controlled for age, gender, IADL and rural living area for which there were significant differences between the groups. According to the model performed at the time of lockdown (T1), both participants living with their spouse and with relatives were less likely to experience negative affect than those living alone (OR = 0.17; p < .001; OR = 0.40; p < 0.01, respectively).

***Risk of experiencing negative affects over time depending living conditions***

The results of a mixed logistic regression analysis are presented in Table 3. This model was controlled for age, gender, IADL, rural vs. urban living area. If we consider the change in the risk of experiencing negative affects over time, all participants were more likely to experience negative affect at the time of lockdown (T1), compared to the previous cohort study (T0) (p < .01), while there was no difference after the lockdown (T2). Concerning the change in the risk of experiencing negative affect according to the living conditions, participants living with spouse were significantly less likely to experience negative affect than participants living alone (p < .01), while there was no difference between participants living alone and cohabiting with relatives. Finally, the change in the risk of experiencing negative affect, taking into account the interaction between the living conditions and the time-points follow-up, compared to the previous cohort study, showed that participants living with spouse were significantly less likely to experience negative affect than participants living alone both at the time of lockdown (T1) (OR = 0.23; p < .01), and post-lockdown period (T2) (OR = 0.28; p < .05), while there was no difference between participants living alone and those cohabiting with relatives.

## Discussion

This study aimed to investigate the influence of older adults' living conditions on the risk of experiencing negative affect during the COVID-19 pandemic. The question was whether older adults living with relatives, during the lockdown and post-lockdown were less likely to experience feelings of being lonely, sad, and/or depressed than those living alone. Given that spousal relationships have an important influence on older adults' mental health and their adaptation to stressful situations related to health events (30, 43), we wondered whether living in a couple would be particularly protective for psychological balance.

At a global level, we observed that for all the participants regardless of their living conditions, the risk of experiencing negative affect increased during the lockdown and then decreased during the post-lockdown periods. The latter was comparable to pre-pandemic level of risk. Although older adults reported experiencing few disruptions in their daily lives due to the lockdown and appeared to be less psychologically disturbed than younger adults (44-46), the lockdown remained a source of stress inducing negative affect. However, we observed that the feelings of negative affect returned quite quickly to normal levels after the lockdown, reflecting a rapid adaptation to the health crisis situation. Consistent with prior studies (47, 48), the descriptive results of the PACOVID survey showed a relative low impact of lockdown on older adults' mental health, which highlights their capacity to cope with this context (36). Some studies show that with advancing age people are able to better manage their emotions, in particular negative emotions (49-52). This can be explained by less focus on negative emotions and a cognitive shift to positive emotions (53-56) and a greater psychological resilience linked to a better adaptation to adverse conditions and contexts (50, 57).

Consistently with previous research, social support during the lockdown was protective (22, 58) regardless of the relationship type. According to the present results, older adults who live with their relatives or partner were most protected against negative affects than those living alone during the lockdown. Older adults living with relatives - probably most of times children, and grandchildren - may have shared with them the economic, professional or school difficulties generated by the pandemic. So during the lockdown living with children/grand children could have been a resource. However afterwards the family problems to which the older person has been closely exposed may have generated worry. Furthermore, cohabitation is likely to have fostered interactions and new productive roles for older adults with their children and grandchildren during lockdown. As shown in the Experience Corps® programme (59, 60), generativity through intergenerational activity engagement leads to health benefits for older people. Several studies also show an association between generativity and less psychological distress (61, 62). The end of the lockdown may have limited the involvement of older people and intergenerational interactions and thus may explain the fact that these positive effects did not last over time.

So that, over time, only those living with their spouse had

a lesser risk of experiencing negative affect compared to those living alone, both during and after lockdown. This could be explained by the spouse's dyadic adjustment process to the stressful situation (63) (for a review, see Falconier et al. (64)). Indeed, when a health event occurs, older couples tend to adapt subconsciously in order to lessen the impact on their psychological state. The marital functioning of long-term couples is characterized by the fact that the high number of years of living together gives rise to psychological similarities and by a reciprocal, rapid adjustment to adverse events (65, 66). According to Carstensen's socioemotional selectivity theory (67), with ageing comes an increasing importance of close relationships (67-69). Thus, even if living with relatives was a psychological resource during lockdown, the adjustment could have been more efficient between spouses. Compared to older adults living with relatives, older spouses have lived and functioned together generally for decades while people living with relatives have a lower level of intimacy and interaction and have not developed similarities in psychological functioning. These findings highlight the importance of couple functioning when investigating the impact of the pandemic on the mental health of older adults.

### *Study limitations and Strengths*

Despite a large initial sample ( $n = 677$ ), the selection criteria required for this study led to a significant reduction in the sample of participants included in the final analyses. Although «living alone» and «living with a spouse» groups remained substantial ( $n > 100$ ), the group of participants cohabiting with relatives was small ( $n = 30$ ). A lack of statistical power could partially explain the null difference between participants living alone and those cohabiting with relatives. Although further investigation is warranted our sample size meets the criteria required to perform mixed logistic regressions, especially since we used repeated measures over time.

In addition, the descriptive statistics indicate that participants living with a spouse (vs. alone or with relatives) had better general socio-demographic and health characteristics. In order to limit the impact of inter-group differences, we both excluded participants with dementia and/or ADL and used statistical adjustment for these variables. The main differences were in age (although not exceeding 3.28 years on average), and in the level of dependence on activities of daily living, but the overall level of cognitive functioning was comparable as was the level of subjective health. In addition, we could have excluded participants with a major depressive state and/or the presence of high depressive symptomatology just before the lockdown period, as they probably already had negative affects which were not necessarily related to lockdown. However, the design of the epidemiological surveys on which this study is based did not allow us to identify such participants.

Despite these limitations, this study offers novel insight since, to our knowledge, it is the first one to longitudinally examine the influence of older adults' living conditions on their negative affect during and after the lockdown. Our findings highlight the importance of living with relatives

as an adjustment factor to stressful situations such as the pandemic. While the beneficial effects of social support are well-established, this study demonstrates more specifically the protective impact of living as a couple.

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*Conflict of interest:* The authors report there are no competing interests to declare.

*Description of authors' roles:* V. Bergua and S. Caillot-Ranjeva designed the study, carried out the statistical analysis, and wrote the paper. C. Meillon participated to design the study, and assisted with carry out the statistical analysis. H. Amieva supervised the data collection, coordinated the PACOVID survey and reviewed the article.

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