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SOCIAL NETWORKS AND MENTAL HEALTH:

THE EXPERIENCE OF CAPE-VERDEAN MIGRANTS IN PORTUGAL

Cátia Batista[1] **Rita Neves**[2]

ABSTRACT

Immigrant integration is an inherently stressful process that implies psychological challenges. To moderate the impact of the post-migration stressors, social support may play an important role. Using survey data on recently arrived Cape-Verdean migrants in the Lisbon Metropolitan Area, we analyse the role of both destination and home social networks on migrants' mental health. We find that destination networks significantly reduce overall anxiety and female migrants' emotional distress. However, larger home networks lead to an increase in overall anxiety and are associated with poorer mental health indicators for female migrants, who may be subject to larger pressure to send financial remittances back home. However, home networks have a positive effect in reducing male migrants' emotional distress.

Keywords: International Migration; Immigration; Mental Health; Social Networks; Gender; Cape-Verde; Portugal

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1. INTRODUCTION

According to the World Health Organisation (WHO), mental health is a "state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community."[1]

Although mental health is essential for the economy and society of a country, there is limited public investment in the supply of psychological support services. Difficulties in access to these services are reinforced by the stigma and discrimination associated with mental health problems. As a result, poor mental health has large costs to the economy. The WHO values the cost to the global economy of lost productivity due to anxiety and depression to be 1 trillion US$ per year. [2]

Migrants' mental health, in particular, is vital for European countries, not only because international migrants represent 24.2% of their workforce[3] but also because migrants are a crucial component in reducing demographic imbalances in these countries. Therefore, the cost of poor migrant mental health to Europe is particularly important, especially since the immigration and integration processes are naturally stressful (Levitt et al. 2005), with several psychological challenges (Carta et al. 2005).

The psychology and epidemiology literatures find that the mental well-being of international migrants tends to be negatively affected, if not by the migration process per se, by the post-migration environment the individuals encounter and, the intrinsic stress of having to settle in a new environment (e.g., Carta et al. 2005; Llácer et al. 2007). For instance, the

[1] 'Mental Health: Strengthening Our Response'. 2018. Accessed 10 December 2021. https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response.

[2] 'Mental Health in the Workplace'. n.d. Accessed 15 December 2021. https://www.who.int/teams/mental-health-and-substance-use/promotion-prevention/mental-health-in-the-workplace.

[3] International Labour Organization. 2021. ILO Global Estimates on International Migrant Workers. *International Labour Office*, 1–74. http://www.europeanmigrationlaw.eu/documents/ILO-MigrantWorkers-Estimates.pdf

separation from the family, the cultural shock, failure to find employment, loss of social status, and racial discrimination are associated with a higher prevalence, or risk, of mental disorders (Stillman et al. 2009; Quaglia et al. 2021)

In this study, we will analyse whether migrants' social networks both at home and in the destination country support migrants' mental health. Based on the literature, we simultaneously test two main hypotheses: a potential positive role of the destination network (arising from information and social support) and a possible negative effect of home networks (associated with a higher pressure to send remittances). Additionally, we will differentiate the impact of networks on the mental well-being of female and male migrants since the literature reports that the effect of social support on mental health differs across genders due to differences in the migrant's involvement with the network (Wethington et al. 1987) and differences in the network composition (Smith-Lovin and Macpherson 1993).

For this purpose, we use data from a survey questionnaire on 647 recently arrived Cape-Verdean Immigrants in the Lisbon Metropolitan Area (AML) and estimate a Two-Stage Least Squares (2SLS) model to measure the impact of both destination and home networks on mental health while addressing endogeneity concerns.

We find that destination networks are usually insignificant when accounting for home social networks, except for a significant positive effect on women's emotional distress. However, we see main gender differences in the impact of home social networks. More extensive home networks are associated with poorer female mental health indicators. At the same time, the networks for male migrants tend to have a positive, insignificant impact on most indicators, except emotional distress.

Our paper contributes to the literature by, for the first time, simultaneously examining the role of both social networks at the destination and home countries on the mental health of recent migrants while distinguishing between these effects across different genders. Relative to

existing literature, we provide innovative evidence that the mental health of female immigrants is negatively affected by home networks when they leave children in the home country and send remittances back home. This pressure to remit is likely related to gender cultural norms prevalent in the home country, that persist after migration regardless of social networks at destination.

2. LITERATURE REVIEW

The role of social support from migrant social networks in the destination country has been widely studied in the literature. These networks play an essential role in the decision to migrate – the larger the network, the less costly is the migration process (e.g., McKenzie and Rapoport 2010; Beine et al. 2011; Beine et al. 2015), and the better the network, the fewer mistakes are made in the decision to migrate (Elsner et al. 2018).

In addition, migrant networks at destination are a key component in the integration of the migrant in the host country, as these networks provide initial support upon arrival of the migrants (van Meeteren and Pereira, 2018); information on job prospects to future migrants (Elsner et al., 2018); and, more generally, more job security and better wages (Batista and Costa, 2018).

Social networks in the destination country may also provide institutional details about public services, namely the healthcare system, which is particularly relevant for our topic of study. This role of networks reduces, for instance, the cost of locating healthcare providers and eases access to such services (Deri 2005; Dellinova 2008). Besides information, Deri (2005) argues that destination also affects migrants' behaviour through norms as they can affect the perceived efficiency or the desirability of the available services which in turn affects recent migrants' demand for such services.

Furthermore, destination networks and home networks play an important role in improving migrants' mental well-being. The literature reveals two main channels of how social

networks influence mental health: (1) the main effect - regardless of the situation, any social interaction with the network will translate into a positive psychological outcome, for example, through conversations with other migrants who share common experiences (Marmados and Sacerdote 2004; Thoits 2011a); and (2) a stress-buffering effect - during difficult periods, such as the migrants' integration period, the network will provide material assistance and emotional support (Cohen and Wills 1985; Turner and Lloyd 1999). This latter effect will reduce the impact of integration stressors and promote well-being, particularly among disadvantaged migrants, i.e., individuals with low educational levels or who work more hours (Meng and Xue, 2020).

For these reasons, recent migrants tend to settle in areas where there is an already well-established community of their fellow citizens (Edin et al., 2003; Pedersen et al., 2008; Beine et al., 2011). However, since these communities are mainly composed of individuals with the same ethnicity and background, less diverse sources of information are available. Therefore, the access to information, for example, on migrants' regularization, is more difficult than if the migrant had a larger and more diversified network which may increase stress and, consequently, lead to poorer mental well-being. This situation could be supported by "the strength-of-weak-ties hypothesis" (Granovetter 1973), which states that acquaintances have less overlap in their contacts and, therefore, may receive more information from different sources.

Moreover, Kawachi and Berkman (2001) argue that these social networks may induce psychological costs, such as indebtedness and obligation pressures. Migrants who send remittances have a greater opportunity cost in socializing in the destination country since they have more pressure to work longer hours; this added pressure may have adverse effects on the mental well-being of the migrant (Meng and Xue, 2020). Additionally, since migrants tend to have limited social and economic resources, migrants who remit to their home community may face an additional mental cost if incapable of supporting their home network.

3. THEORETICAL FRAMEWORK AND HYPOTHESES

As previously stated, there are two main channels through which social networks influence mental health – the main effect and the stress-buffering effect – which are not mutually exclusive (Cohen and Wills 1985). The stress-buffering channel is an active effect that functions mainly in stressful situations. In contrast, the main channel is an indirect effect that arises from ordinary social interactions, regardless of whether the migrant is under stress or not (Cohen and Will 1985). Thoits (2011a) describes further these channels and finds seven possible mechanisms in which these effects may impact mental well-being. These mechanisms are grouped into emotional support and active coping assistance (Thoits 2011a). Based on her work, we propose a theoretical framework to examine social networks' potential positive and negative consequences on migrants' mental well-being.

Destination Networks are expected to affect positively mental health through social influence and comparison. This arises from the existence of role models within the community who provide normative guidance about, for example, health behaviours (Berkman and Glass 2000; Deri 2005). Moreover, the destination network may observe behavioural changes related to depressive states and intervene to improve the migrant's mental health (Thoits 2011b). Besides, larger social networks provide more diversified information and advice and offer emotional support through, for example, the validation of the recent migrant feelings and concerns and compassion. This will improve the migrant's self-esteem, sense of control, belonging, and companionship, and the migrant's perceived support availability; consequently, it will positively affect mental health indicators.

Finally, the role of home networks on migrants' mental health is not as clear. On the one hand, the home network will provide emotional support by demonstrating the importance of the migrant to them ("mattering"), which is expected to have a positive effect on the migrant's mental well-being. However, this mechanism may negatively affect mental health

indicators due to the importance of the financial support provided by the migrant to the home network. Not only will the migrant feel additional stress to send remittances, but she may also feel an additional mental cost if she is unable to send them financial help. Besides, migrants who send remittances may have a greater opportunity cost in socializing in the destination country since they have more pressure to work longer hours. Consequently, they may experience fewer positive effects of the destination network (Meng and Xue 2020).

4. METHODOLOGY AND DATA

4.1. Local Context: Cape-Verdean Community in Portugal

Our paper will test the theoretical hypotheses put forward among Cape Verdean immigrants who recently arrived in Portugal, as this is a large community that is economically active but nevertheless faces significant integration challenges.

The Cape-Verdean community is the second-largest immigrant community in Portugal (7.2% according to the Portuguese National Statistics Office – INE, 2012). This community is not only essential for the Portuguese workforce since 83.7% OF Cape-Verdeans are on active labour force (in comparison to only 65.3% of active Portuguese labour force), but it is also necessary to deal with the demographic fragilities the country faces. In 2019, 21.8% of the Portuguese population had more than 65 years old while the Cape-Verdean community average age was 34 years old (INE 2014).

Although Portugal is considered one of the countries with the best integration policies[4], in reality, migrants face severe integration challenges, which have been found in the literature to be associated with poor mental health. Firstly, the inefficiency of immigration services leads

[4] 'Portugal | MIPEX 2020'. n.d. eww.mipex.eu. Accessed 8 December 2021. https://www.mipex.eu/portugal.

to long delays in obtaining residency permits[5]; additionally, the unemployment rate for Cape-Verdean immigrants is significantly higher in comparison with unemployment rates from Portuguese and from other non-EU immigrants in the country (27.8, 12.9, and 19.8, respectively, INE 2011). Besides, immigrants are 10.4pp more likely to be in a situation of social exclusion (Oliveira 2020), and 25.7% reside in overcrowded homes, usually in 'illegal' shacks in social neighborhoods (EUROSTAT 2017). Finally, Cape-Verdeans are discriminated against not only their condition as immigrants but also due to their skin complexion; in 2016, 27% of African migrants reported to have been discriminated against based on their ethnicity and skin complexion (FRA 2017). All of these challenges were related to a higher risk of mental health disorders.

4.2. Sampling and Survey

The data used in this paper was collected through a representative survey of the Cape-Verdean immigrant community in the Lisbon Metropolitan Area (AML). It was administered between September 2020 and June 2021. The survey was conducted among 820 immigrants[6] ranging between 18 and 65 years old. Moreover, the migrants interviewed had to reside in the AML and should have arrived in Portugal during the five years preceding the interview; in addition, they could not have Portuguese or any other European Nationality. Eligibility requirements were also set to maximize the probability of migrants having contacts outside of Portugal, more specifically in the home country, Cape Verde.

[5] Obtaining residency or getting an appointment in SEF, in some cases, took up to four years (see Neves, "SEF chama imigrantes com processos pendentes desde 2017.")

[6] The survey used in study was conducted to a total of 820 immigrants; however, we will only be able to assess the role of social networks on migrant's mental health from 647 observations. This is due to the fact that the section in the survey on mental health was only added to the questionnaire a month after the beginning of data collection which led to a loss of 11.10% of the observations; Additionally, the home network variables (both size of the network and frequency of contact with the immediate family) have also approximately 11% of missing values. This will reduce the number of available observations in which we will be able to run the regressions.

The survey was conducted by Cape-Verdean enumerators who received detailed classroom and in-the-field training by the research coordinators. Then, these enumerators were supervised by members of the research team to ensure data quality. To maximize trust, the interviews were held in Cape-Verdean Creole. Furthermore, respondents were informed that the data collected would be anonymized and only be used for academic research.

Finally, the design of the survey and the data collection strategy were developed to ensure a representative sample of the Cape-Verdean immigrant community.

4.3. Descriptive Statistics

Table 2 in Appendix A compares the recent Cape-Verdean Immigrant sample with the Cape-Verdean Community in Portugal. The sample is constituted by 57.32% of female migrants and 42.68% of male immigrants. 84.88% of the respondents live in the five municipalities with the largest Cape-Verdean Communities in 2011 - Sintra, Amadora, Loures, Lisboa, and Seixal. Like the Cape-Verdean Community in Portugal, most of the recent immigrants interviewed were single (77.06% and 85.85%, respectively). 67.20% of our sample is currently employed compared to 40.81% of the Cape-Verdean community employed in 2011. Also, in 2011, most of the Cape-Verdean Community had less than or the fourth grade ("Less than Basic Schooling) – 66.01%; - however, currently, the Cape-Verdean migrants who arrive in Portugal have Secondary or Post-Secondary Education (75.98% of the sample). In terms of religion, most of the Cape-Verdean Community and sample are Catholics (73.92% and 77.32%, respectively). In 2011, the Cape-Verdean residents in Portugal had an average age of 34 years old; the recent migrants in the sample have, on average, 28 years old.

Moreover, Table 3 in Appendix A shows the summary statistics and description for the variables under analysis in this study. Some additional characteristics about the sample composition added by Table 3 are that, on average, the recent migrants who have migrated for

the first time are in Portugal for a bit longer than two years and 28% of them have left-behind children in Cape-Verde.

4.3.1 Description of the independent and control variables

4.3.1.1. Main Outcomes

Mental Health Index The mental health index was generated from the answers given to nine statements adapted from the most used instruments of evaluation of mental well-being, specifically the BDI-II (Beck, Steer and Brown 1996) [*The statements can be found in Appendix B*]. The answers were given on 5-points Likert Scale (Disagree-Agree), in which the highest value would translate into the worst indicator. To ease interpretation, we inverted the scale into a positive mental health index; the index used in the analysis will entail a high value for migrants with good mental health and a lower value for poorer mental health. The index was calculated as a simple mean of the score given to each answer and takes values between 1 and 5. On average, individuals have a mental health index with a score of 3.22.

Similar to the subdivision performed on the BDI-II Index, we divide the mental health index into two subdivisions to better understand the effects of social networks: (A) an index comprised of the emotional component of mental health problems and, (B) a physical component:

A. **Emotional Distress** From the statements used to evaluate the mental health state, we only considered the affective components to generate the emotional distress index (e.g., sadness and feelings of hopelessness). The index is created by calculating the average Likert scores given to each statement. The emotional distress index ranges between 1 and 5 and, a higher value of the index is associated with a larger emotional distress. On average, recent migrants have an emotional distress index score of 2.87.

B. Anxiety To calculate the level of anxiety, we only considered the statements on the physical effects of stress. The statements include whether the individual has hardships resting or focusing if she feels chest pain or whether her body shakes when worried. The index is created by calculating the average Likert scores given to each of the statements and ranges between 1 and 5. A higher value of the index refers to a higher level of anxiety. On average, the anxiety level has a score of 2.58.

4.3.1.2. Variables of interest

Ideally, the social networks should be measured both in terms of quantity, i.e., the number of members that compose the migrant's network, and quality, e.g., the help provided or offered by the network. In the survey, we directly ask the migrant the number of people they have regular contact with, in Portugal and Cape Verde. Unfortunately, we are unable to evaluate the strength of the ties among the individuals who compose the social support of the migrant. Although we have full information about the immediate family in the home country and about the household of the migrant in the destination country[7], we were unable to obtain representative data for the friends and family who are not part of the household and with whom the migrant has contact with. The reason behind this is due to the fact that collecting information about social networks is expensive, time-consuming and cognitively demanding for the respondent (van der Poel 1993; Kogovšek et al. 2002), therefore the survey used a name generator procedure where the migrant would only give information about the five most frequent contacts. Consequently, the data collected is not representative of the whole network, and the answers may be biased towards the stronger contacts within the network[8]

Destination Social Network The size of the destination network was calculated as the sum of the number of people who are part of the migrant's household and the number of

[7] In this context, household is defined as the people who the migrants live with and with whom shares expenses on rent, utilities and food.
[8] For further details on name generator limitations, see, for example, Burt (1984)

friends/relatives, who are not part of the migrant's household, but with whom she keeps regular contact with, in Portugal. On average, the home network is comprised of 6 individuals and, the median value of the variable is 5 but, to reduce the effect of one outlier equal to 101, the values were winsorized at 1%.

Home Social Network The home network was computed as the sum of the values provided by the respondent to how many spouses, children, or parents ('immediate family') the migrant has who live in Cape-Verde and, the number of other close relatives and/or friends in Cape-Verde with whom the migrant has regular contact with. On average, the home network is comprised of 5 individuals (Mean = 5.5 and Median = 5). Similar to before, the values were winsorized at the 1% level to reduce the effect of two outliers whose value was 51.

4.4. Empirical Strategy and Identification

4.4.1. Main Econometric Equation

Following our previous analysis and, due to its demonstrated importance for migrant workers (e.g., Elsner et al. 2013; Meng and Xue 2020), we will focus on the network size as our main measure of social networks.

We use the following econometric specification to study the effect of both the migrant's destination and home networks on several mental health outcomes:

$$Y_i = \alpha + \beta_1 Dest\_network_i + \beta_2 Home\_network_i + \delta X_i + \varepsilon_i \qquad (1)$$

where the subscript *i* denotes individual *i*; Y_i is one of the mental health outcomes described in the data section; *Dest_network* is the size of the migrant's social network in the destination country; *Home_network* denotes the number of people with whom the migrant keeps in contact with, in the home country. X_i is a vector of individual characteristics which may be associated with mental well-being, including the year of birth and a female indicator variable. We also include a control for the years of education since the impact of the social network on mental

health may decline with the level of schooling (Devillanova, 2008). We also include an indicator variable for being unemployed, since unemployment is found to have a strong correlation with mental health disorders (Pernice and Brook 1994), - and an indicator variable which takes the value 1 if the migrant is married and his/her spouse is not living in the migrant's destination country. Robert and Gilkinson (2012) found that single immigrants were less likely to suffer from emotional problems in comparison to married immigrants; and that these emotional problems are expected to intensify if the spouse lives abroad. We also control for the respondent's own migration history and integration period, by adding an interaction variable that accounts for the number of years since arrival in the destination country if the migrant has migrated for the first time. Adding this set of characteristics as controls is important to deal with potential omitted variables bias. In particular, the addition of pre-migration characteristics allows us to indirectly account for the mental-health condition prior to migration which may partly determine the current mental health condition of the migrant.

The econometric specification is estimated by Ordinary Least Squares and our parameters of interest are β_1 and β_2. If both social networks were exogenous, the OLS estimates of β_1 and β_2 would correspond to the effect of the destination and home social networks, respectively, on mental health outcomes Y_i.

4.4.2. Threat to Identification and Instrumental Variable (IV) Approach

There is a main threat to identification: the possible 'reverse causality between the size of the destination network and the mental well-being of the immigrant during the integration period. The possible endogeneity of the variable of destination network arises from the fact that migrants with a worse mental mental-wellbeing may not be willing to meet people and create a more extensive and solid network. Moreover, the OLS results could be affected by a simultaneity bias since personal attributes such as introversion, which we are unable to measure,

may translate into lower mental well-being and smaller destination networks (Kawachi and Berkman 2001; Meng and Xue, 2020).

To address the potential endogeneity of the size of the destination network, we will use an IV approach. Due to the difference between the social network composition of female and male migrants (Moore 1990), we will have three different combined IVs (i.e., one for each sample and subsample: total, female and male).

4.4.2.1. Female IV

Women have more difficulty integrating and establishing a diverse destination social support. The destination social network of women tends to be restricted to a limited number of contacts, often within a specific group, for instance, the group of co-workers, and tends to be heavily gendered, for instance, due to social norms (Hagan 1998; Zhang 2006). Consequently, these characteristics limit women's upward social mobility (Hagan 1998; Zhang 2006). As a result, female migrants' networks are composed of stronger and more kin-based ties than men's (Smith-Lovin and Macpherson 1993).

Therefore, because women's networks are comprised of stronger ties, we include an instrument that accounts for these contacts – a dummy variable which takes the value of 1 if the migrant shares expenses of utilities, rent, and food with the household where she lives (*share_expenses*). The act of sharing expenses has no direct relationship with mental health, and it has a moderate correlation with the destination network. Suppose the person shares the cost of living with her household. In that case, it is likely that her destination network is larger and that her tie with her housemates is stronger than a migrant who rents a room in a shared apartment and pays her rent and expenses.

Additionally, to increase the instrument's strength, we add another IV that measures whether the migrant is part of a religious community in the destination country. *freq_church* is a dummy variable that takes the value of 1 if the migrant attends religious ceremonies at least

once a month. Religiosity is deeply rooted in the Cape-Verdean culture; not only in terms of formal religiosity, with Catholicism corresponding to 77.29% of the Cape-Verdean Population (and women representing 53.3% of Catholics)[9] but also in terms of popular religiosity, through the worship of local patrons saints (Bäckström 2009). Consequently, regardless of the mental health state of the individual, she will remain religiously involved as it is considered a culturally valuable behaviour (Le et al. 2007) therefore, *freq_church* is exogenous. Besides, participating in religious services per se does not affect directly mental health. Attending religious services regularly will affect mental well-being through a larger network and regular contact with the other devotees and religious role models, which will provide structures for coping with stress (Opsahl et al. 2018). Moreover, Bäckström (2009), who also studied the Cape-Verdean immigrant community in Portugal finds that religion is not related to differences in health.

To sum up, to assess the effect of the networks on the mental wellbeing indicators of female migrants, we will use the following Two-Stage Least Squares model:

$$Y_i = \alpha + \beta_1 Dest_{network_i} + \beta_2 Home_{network_i} + \delta X_i + \varepsilon_i$$

$$Dest\_network_{female} = \text{Share\_expenses}_i + \text{Freq\_church}_i + \mu \qquad (2)$$

4.4.2.2. Male IV

For the male sample, similar to the first component used to instrument the destination network in the female sample, we add the dummy of whether the individual shares expenses with his housemates. The reasoning is similar to the arguments provided previously, having more attachment to the people you live with may translate into having more ties in the destination network.

[9] Data retrieved from CENSO 2010 - IV Recenseamento Geral População e Habitação by the Instituto Nacional de Estatística de Cabo Verde (RGPH 2010; Vol 1)

Contrarily, we will not add an instrument determining whether the migrant is part of a religious community in the destination country since men are less religious than women (Trzebiatowska and Bruce 2012); for instance, from the 10% of people who are not religious in Cape-Verde, 62% are men. Additionally, men tend to have a larger network in comparison to women and this network tends to be comprised of other Cape-Verdean compatriots who tend to live in the same area but do not have necessarily to be part of the same social circles, as it happens in the case of female migrants. Consequently, we will add an instrument which is the absolute value of the Cape-Verdean Community living in the municipality where the migrant settled, in the year prior to migration. Although in the literature (e.g., Deri 2005), the instrument tends to be a relative measure of the community where the migrant settles in, we decided to adopt an absolute as it has a higher correlation with the variable to be instrumented. Also, we only account for the Cape-Verdean Community due to the fact that migrants tend to relate more easily with people from the same ethnicity (McPherson et al. 2001; Currarini et al. 2009).

To sum up, to assess the effect of the networks on the mental health indicators of male migrants, we estimate the following using instrumental variables:

$$Y_i = \alpha + \beta_1 Dest\_network_i + \beta_2 Home\_network_i + \delta X_i + \varepsilon_i$$

$$Dest\_network_{male} = = \text{Community}_{\text{t}-1,\text{i}} + \text{Share\_expenses}_{\text{i}} + \mu \qquad (3)$$

4.4.2.3. Total IV

To assess the effect of the networks on the mental wellbeing indicators of all migrants, we will combine the IVs used to instrument the endogenous variable of both female and male migrants. Therefore, will use the following estimation:

$$Y_i = \alpha + \beta_1 Dest\_network_i + \beta_2 Home\_network_i + \delta X_i + \varepsilon_i$$

$$Dest\_network_{total} = \text{Freq\_church}_{\text{i}} + \text{Share\_expenses}_{\text{i}} + Community_{t-1} + \mu \qquad (4)$$

4.4.2.4. Other considerations

Finally, one possible question that may arise is whether the size of the home network may be affected by the mental health status as well. We believe there is no endogeneity on such variable as it is pre-determined and well-established; therefore, the mental health state will have no impact on the number of individuals in the home country who are part of the social support group. What could be endogenous though, is the frequency of contact with these individuals. The more depressed the migrant may be, due to the hardships of the integration process, it is likely that the frequency of contact with the friends and family, who are not part of the immediate family, decreases. This could be seen as a cool effect of migration.

5. EMPIRICAL RESULTS

Table 1 presents the OLS and IV estimates for the role of social networks on the overall mental wellbeing (Mental Health Index), Emotional Distress, and Anxiety. The first panel of Table 1 (including specifications 1-9) shows the estimates obtained using the full sample, the second panel (including specifications 10-18) presents the estimates using the male sample, and the bottom panel (including specifications 19-27) displays the estimates obtained using the female sample.

The joint significance tests conducted in the first stage yield F-statistics greater than 10 which is the rule-of-thumb threshold suggested in the literature on weak instruments (Stock, Wright, and Yogo 2002). This result indicates that all instruments are relevant estimates, and they are unlikely to be subject to weak instrument bias. As we are combining multiple instruments for one endogenous variable, we also tested for overidentifying restrictions. We fail to reject the null hypothesis that the instruments are exogenous. Overall, these statistics support the validity of the instruments used in our empirical analysis. These statistics are shown for each specification in Table 1.

5.1. Social Networks Impact on the Mental Health Index

As shown in columns (1) to (3) of Table 1, both OLS and IV estimates indicate a non-significant effect of both destination and home networks on the migrant's mental well-being when considering the whole sample. This result is in accordance with the empirical literature in the sense that there is no consensus about the sign of the effect that networks play on migrants' mental health.

Consistent with the existing literature, the gender dummy has a large magnitude (corresponding to a 9.52% increase in overall mental health) and is statistically significant at the 1% level. This led us to hypothesise that the effect of social networks on mental health could vary substantially across gender, which could possible explain the overall statistically null result. Therefore, it is worth analysing the effects of the networks for each gender separately.

Analysing specifications (10)-(12), the social networks at the destination and in the home country have no significant effects on the mental health of male migrants, even after instrumentation.

When we examine the role of social networks on female mental health, shown in columns (19)-(21) of Table 1, we find two distinct effects. First, destination networks have a positive non-significant effect on the female migrants' mental health, although: this becomes close to significant when estimates are obtained using the 2SLS estimation. Second, home networks play a negative and significant effect on mental wellbeing. One more person in the social network in the home country leads to a decrease of 0.8% in the mental health index.

Table 1: Effects of Social Networks on the Mental Health Index, Emotional Distress and Anxiety

		MENTAL HEALTH INDEX			EMOTIONAL DISTRESS			ANXIETY		
		OLS		IV	OLS		IV	OLS		IV
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
FULL SAMPLE	Dest_Network	0.015	0.009	0.034	-0.008	-0.003	-0.036	-0.020**	-0.018*	-0.053*
		(0.009)	(0.008)	(0.028)	(0.008)	(0.007)	(0.028)	(0.010)	(0.009)	(0.031)
	Home_Network	-0.005	-0.006	-0.014	-0.006	-0.006	0.004	0.008	0.0121	0.024*
		(0.011)	(0.010)	(0.013)	(0.010)	(0.009)	(0.013)	(0.011)	(0.011)	(0.014)
	Controls	NO	YES	YES	NO	YES	YES	NO	YES	YES
	Cragg-Donald Wald F-Stat.	-	-	16.958	-	-	16.958	-	-	16.958
	Hansen J Statistic (p-value)	-	-	0.699	-	-	0.917	-	-	0.905
	Observations	647	647	647	647	647	647	647	647	647
		OLS		IV	OLS		IV	OLS		IV
		(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
MALE ONLY	Dest_Network	0.003	0.003	0.001	-0.001	-0.002	0.016	-0.019	-0.019	-0.0401
		(0.011)	(0.011)	(0.036)	(0.010)	(0.010)	(0.036)	(0.013)	(0.012)	(0.0421)
	Home_Network	0.008	0.014	0.015	-0.021*	-0.026**	-0.032*	0.007	-0.002	0.006
		(0.012)	(0.011)	(0.017)	(0.012)	(0.010)	(0.017)	(0.012)	(0.012)	(0.019)
	Controls	NO	YES	YES	NO	YES	YES	NO	YES	YES
	Cragg-Donald Wald F-Stat.	-	-	11.289	-	-	11.289	-	-	11.289
	Hansen J Statistic (p-value)	-	-	0.660	-	-	0.845	-	-	0.868
	Observations	277	277	277	277	277	277	277	277	277
		OLS		IV	OLS		IV	OLS		IV
		(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
FEMALE ONLY	Dest_Network	0.018	0.013	0.067	-0.010	-0.004	-0.103**	-0.016	-0.016	-0.065
		(0.012)	(0.013)	(0.049)	(0.010)	(0.011)	(0.050)	(0.014)	(0.014)	(0.051)
	Home_Network	-0.027*	-0.025	-0.040**	0.016	0.015	0.043**	0.024	0.027	0.041*
		(0.015)	(0.015)	(0.020)	(0.012)	(0.012)	(0.020)	(0.017)	(0.017)	(0.022)
	Controls	NO	YES	YES	NO	YES	YES	NO	YES	YES
	Cragg-Donald Wald F-Stat.	-	-	12.097	-	-	12.097	-	-	12.097
	Hansen J Statistic (p-value)	-	-	0.434	-	-	0.753	-	-	0.954
	Observations	370	370	370	370	370	370	370	370	370

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; The outcomes are measured from a scale of 1-5. Destination and Home networks are measured as the size of the network. Networks are winsorized at the 1% level. Controls include years of schooling; whether the migrant is married with a spouse living abroad; whether the person was unemployed (unemployed=1), year of birth and years since migration. When the full sample is used in the estimation, we controlled for gender (female=1).

5.2. Differential Social Network impacts on items of the Mental Health Index

5.2.1. Social Networks impact on Emotional Distress

We will now examine the role of social networks on Emotional Distress. Results from columns (4) to (6) of Table 1 indicate a non-significant effect of both destination and home networks on the migrant's emotional distress when considering the whole sample.

Analysing specifications (10)-(12), the social networks at the destination have no significant effects on emotional distress of male migrants, even after instrumentation. Moreover, home networks are found to play a positive impact on male migrants' emotional distress; one more individual in the home network would lead to an average decrease of 0.64% points in the emotional distress index.

On the other hand, analysing the female sample (specifications 22-24), we find that the social networks at the destination and in the home country have significant effects on the emotional distress of female migrants after instrumentation. Larger home social network increases a female's emotional distress, on average, by 0.86%; while larger destination networks decrease emotional distress index by 2.06% points, on average.

5.2.2. Social Networks impact on Anxiety

Finally, we analyse the role of social networks on Anxiety. Considering specifications (7) – (9) and (25) – (27), we find that the home social networks have significant effects on the anxiety levels of the whole sample and of the female sample, respectively, after instrumentation. Larger home networks tend to increase women's anxiety, on average, by 0.81% and, increase the anxiety of the whole sample by 0.024 index points, on average.

Regarding the social network at the destination country, specifications (25)-(27) show that there is no significant effect on female migrants' anxiety, even after instrumentation.

Whereas OLS and IV specifications for the total sample, present in columns (7) - (9), show that destination networks play a significant effect in reducing anxiety, on average, a 1.06%,

As shown in columns (7) to (9), both OLS and IV estimates indicate a non-significant effect of both destination and home networks on the male migrant's anxiety.

5.3. Discussion

The insignificant effect of the destination social support on the overall mental health of the migrants, neither female nor male, may suggest two mechanisms: firstly, the role of destination networks is vastly different among genders and, consequently, one of the effects overshadows the other; on the other hand, it may indicate that smaller networks, which usually consist of individuals with whom the migrant has stronger sentiments of friendship (Homans 1950) may also be able to assist the migrant with information to deal with the stressful event she may be experiencing. In this sense, closer contacts may be strongly invested in alleviating the psychological distress the migrant is facing not only through active emotional support (Thoits 2011a) but also by actively searching for the different sources of information the migrant may need to solve such situation.

Nevertheless, the results show that destination networks significantly attenuate female migrants' emotional distress. We believe that the destination network may influence women's mental health through two channels: 1) Through access to diversified sources of information and advice, and 2) through larger emotional support, common experiences, and empathy which could help to deal with the negative effect of home networks on female migrants' mental well-being found in the results.

Although home networks increase the feelings of emotional distress and anxiety for women, for men home networks reduce the feeling of emotional distress. The reason for this difference in the results could be due to several factors. First, women tend to be emotionally closer to their network than men (Kawachi and Berkman 2001), therefore women will have

stronger feelings and suffer more from being apart from their closest relatives (Bell 1991). Secondly, this difference may be affected by strong gender social norms since patriarchal attitudes persist in the Cape-Verdean culture. The Cape-Verdean women are the centre of the households (48% of households were headed by women in 2015)[10], while men are seen as the traditional breadwinner. When a woman migrates, the culturally established role reverses from being the family's core to becoming the provider. The emancipation of women in migrating decisions could lead to additional social pressure from her home community due to prejudice from "abandoning" her family, especially if children are left behind. This may lead to a higher pressure to send remittances to prove to her community that she is still actively supporting her family, leading to additional pressure to succeed. Consequently, this could lead to the strain in emotional distress and anxiety.

Reversely, home networks may decrease male emotional distress due to increased moral support and less social pressure as men are historically the figure who migrates to provide for their family. Consequently, their role in the home community is validated, translating into mental health benefits.

5.4. Robustness Checks

In this subsection, we conduct several robustness tests and analyse some of the possible mechanisms driving our results. The results are presented in Tables 4-8 in Appendix A.

Initially, we analyse whether our results are robust to the inclusion of additional controls. To do this, we add a dummy variable, which takes the value one if the migrant has never smoked nor drank alcohol [Table 4 in the Appendix]. In addition to potentially proxying for physical health status, including this variable in the regression may also contribute to mitigating potential omitted variable biases, in that smoking and alcohol consumption may be

[10] 'Cabo Verde: Country Gender Profile'. 2018. Accessed 10 December 2021. https://www.unwomen.org/sites/default/files/Headquarters/Attachments/Sections/Library/Publications/2018/Country-gender-profile-Cabo-Verde-en.pdf

correlated to mental wellness prior to migration. We replace the employment status variable with a dummy variable which takes the value one if the migrant works more than 40 hours per week[11] since long working hours were found to be correlated with mental health problems (Sparks et al. 1997; Kuroda and Yamamoto 2016) [Table 6 in the Appendix]. All estimated results are robust to the inclusion of these controls.

In addition, we add controls for 'whether the migrant left-behind children in Cape-Verde' and 'whether the migrant sends remittances'. These two variables may be related to additional mental costs due to higher pressure to support the family left behind in the home country. Adding these controls implies that home networks no longer significantly affect migrants' anxiety levels, and the effects on female emotional distress are less significant, as can be seen in Table 5 in Appendix A. This evidence implies that the negative effect of the home network in female mental health arises precisely through this mechanism: kinship within the network increasing pressure to support the family left behind in the home country. The effects on emotional distress are robust when we also control for remittances and whether the migrant left children in CV. However, the effect of home networks on the anxiety of the total sample becomes insignificant, possible through the emotional support from home which may attenuate the stress levels and decrease the likelihood of physical anxiety.

In line with this finding, we also test for a further possible mechanism that may explain the role of home networks on migrants' mental health. We replace the variable, which previously measured the size of the network, with the frequency of contact with the immediate family, i.e., parents, spouses, and children. This variable ranges between 1 and 5, the highest value being the highest frequency of contact.[12] Higher frequency of contact with the closest

[11] The Portuguese Law establishes a maximum of 40 weekly hours of work. Retrieved from: 'Sistema Laboral - Horário de Trabalho'. n.d. Accessed 14 December 2021. https://www.portugalglobal.pt/PT/InvestirPortugal/SistemaLaboral/Paginas/HorarioTrabalho.aspx

[12] See Appendix B for more details.

family could lead to poorer mental well-being due to more direct pressure of sending remittances, as shown by Batista and Narciso (2018). Also, for women, a larger frequency of contact with the closest relatives may decrease psychological distresses due to emotional support from the "mattering" effect. Table 7 in the Appendix presents the results of this robustness check.

When analysing the overall sample, the home network remains insignificant, but it now presents a positive effect on the mental health index. Its effect will also change between females and males: home networks are no longer significant for women but become significant for men with a slight increase in the magnitude of the effect. A higher frequency of contact with the closest relatives leads to better male overall mental health (an average increase of 1.7% in the index of overall mental health).

Also, the effect of the home network becomes insignificant for male emotional distress but, it plays a significant effect on the anxiety levels. Higher contact with the immediate family, reduced anxiety by 2.8%, on average. For females, the frequency of contact with the close family will increase the magnitude of the significant effect on emotional distress. Therefore, the more frequent the contact, the higher the emotional distress with an average increase of 2.52% points. The effect on female anxiety becomes insignificant.

6. CONCLUDING REMARKS

This paper aims at contributing evidence to the literature measuring the role of social networks on the mental health of immigrants, given the crucial importance of immigration to the economies of ageing countries like Portugal.

We simultaneously measured the impact of both destination and home networks on mental health using a 2SLS model to address endogeneity concerns. We found that destination networks play a significant role in decreasing the emotional distress felt by women, likely due to the existence of role models and active emotional support.

Additionally, our paper introduces new findings to the literature on the effect of home networks on migrants' well-being. While for men, larger home communities are associated with better mental health indicators, for women they play a negative role. These differences may be the consequence of gender social norms which persist in the Cape-Verdean culture and place more pressure on women to support their family left behind, additionally contributing to the fact that women suffer more with being distant from their closest relatives (Bell 1991).

Given our findings, it would be interesting that future research addresses the interaction between cultural norms and changes in the mental health of female migrants from different cultural backgrounds. In particular, it would be important to assess the different roles played by strong and weak ties within the home networks since these seem to impact mental health differently depending on the gender and cultural norms of immigrants. In this context, it would also be relevant to learn about how gender norms followed by migrants evolve over time after migrants arrive in the destination country and, their impact on mental health.

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APPENDIX A – TABLES AND FIGURES

Figure 1 – Map of the Lisbon Metropolitan Area (AML – Área Metropolitana de Lisboa)

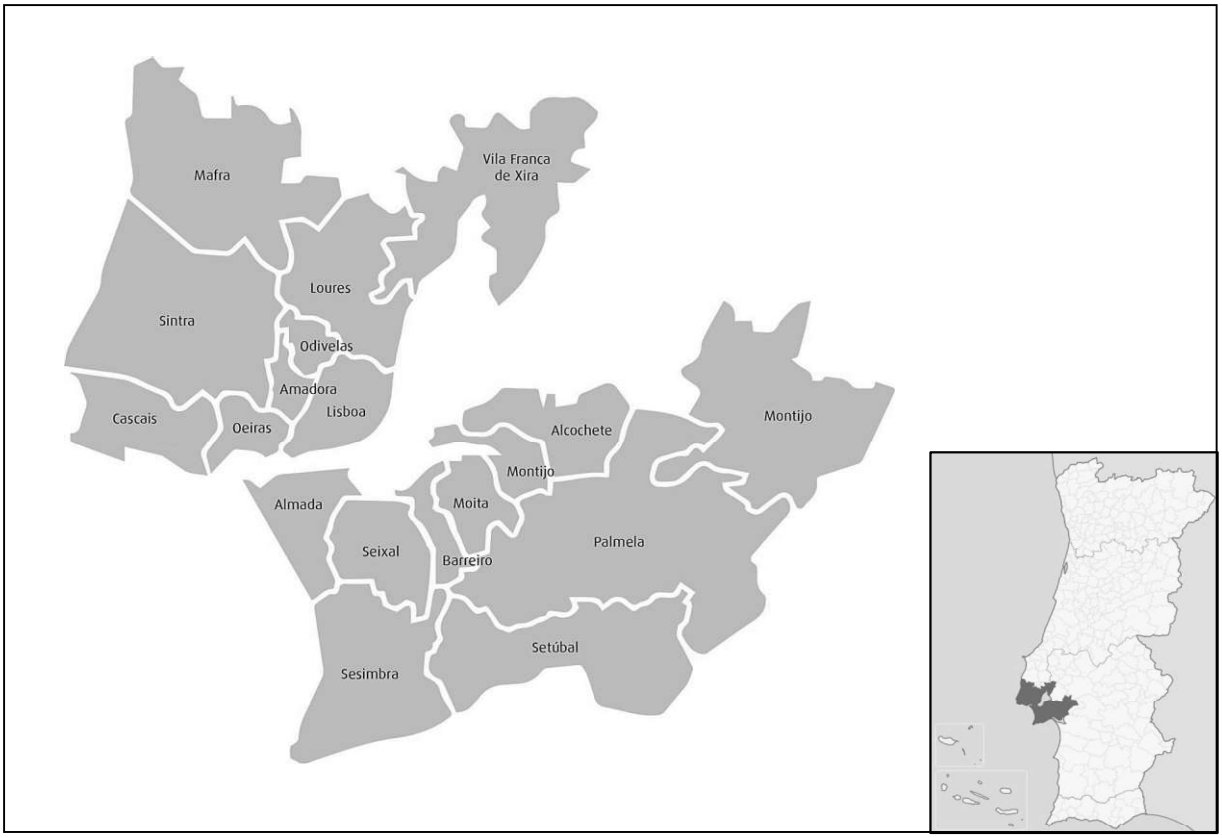

Figure 2 – Evolution of the Cape-Verdean Community in the AML, in the last 5 years

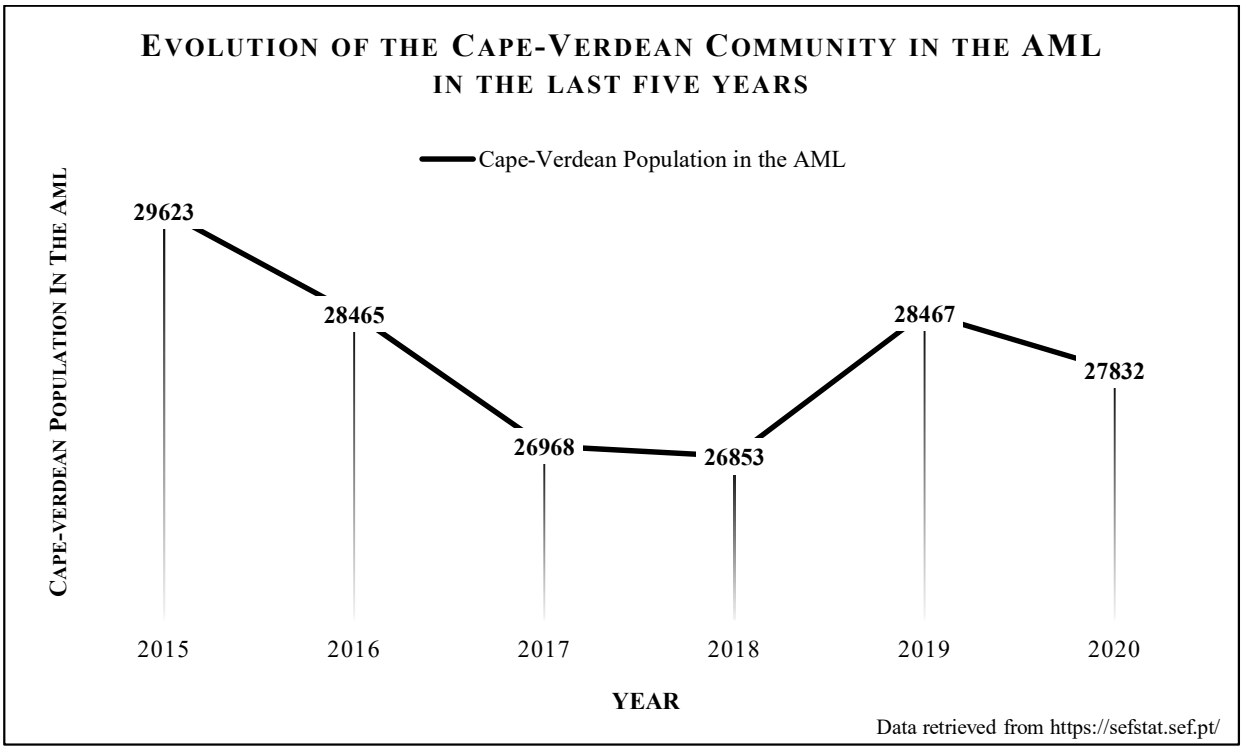

Table 2 - Comparison between the composition of the Cape-Verdean (CV) Community in Portugal and the sample of recent Cape-Verdean migrants who arrived between 2015 - 2021

Indicator	Cape-Verdean Community in 2011 (Census 2011)		Sample of Recent CV Migrants	
	N	%	N	%
Gender				
Male	18537	47.66	350	42.68
Female	38895	52.34	470	57.32
Total	*38895*	*100*	*820*	*100*
Municipalities in Portugal with the largest Cape-Verdean Communities				
Sintra	7231	18.59	320	39.02
Amadora	6400	16.45	265	32.32
Loures	2755	7.08	5	0.61
Lisboa	2644	6.80	37	4.51
Seixal	2627	6.75	69	8.41
Total	*21657*	55.67	696	84.88
Marital Status				
Single	29974	77.06	704	85.85
Married	7079	18.20	103	12.56
Widow/Divorced	1842	4.74	13	1.59
Total	*38895*	*100*	*820*	*100*
Employment Status				
Employed	15873	40.81	551	67.20
Unemployed	6119	15.73	129	15.73
Out of the labour force	16903	43.46	140	17.07
Total	*38895*	*100*	*820*	*100*
Level of Education (Population between 15 and 64 years old)				
Less than Basic Schooling	18592	66.01	20	2.44
Basic Schooling	7960	28.26	107	13.04
Secondary and Post-Secondary	544	1.93	623	75.98
Graduate	1071	3.8	70	8.54
Total	*28167*	*100*	*820*	*100*
Religion (Population with more than 15 years old)				
Catholic	25806	73.92	634	77.32
No religion	2115	6.06	116	14.15
Other Christian	1091	20.02	64	7.80
Other religion (Islam)	-	-	4	0.49
Total	*34911*	*100*	*818*	*99.76*
Average Age	34 years old		28 years old	

Notes: Census Data was retrieved from 'A População Estrangeira em Portugal'. INE - Instituto Nacional de Estatistica. 2012.

Table 3 – Descriptive statistics and description of the outcome, interest and control variables, for the whole sample

	Obs.	Mean	Std. Dev.	Min.	Max.	Description
Outcome variables						
Mental Health Index	647	3.222	0.796	1	5	Poor Mental Health = 1 to Excellent Mental Health = 5
Emotional Distress	647	2.866	0.712	1	5	Low Emotional Distress = 1 to High Emotional Distress = 0
Anxiety	647	2.584	0.848	1	5	Low Anxiety Levels = 1 to High Anxiety Levels = 0
Main interest variables						
Destination Network	647	6.059	5.322	0	101	Number of people who are part of the migrant's destination network (Self-reported)
Home Network (Size)	647	5.570	4.036	1	51	Number of people who are part of the migrant's home network (Self-reported)
Home Network (Frequency of contact with immediate family)	647	1.715	0.771	1	7	Frequency of contact with the immediate family (spouse, children and/or parents) in Cape-Verde. The higher the index, the more frequent is the contact with the relatives.[1]
Control variables						
Gender (Female = 1)	647	0.574	0.495	0	1	Female = 1 and Male = 0
Years of Schooling	647	12.323	2.914	0	17	Number of years in the educational system
Married with spouse living abroad	647	0.012	0.111	0	1	Dummy which takes value 1 if the migrant is married but the spouse lives abroad, i.e., not in Portugal (0, otherwise)
Employment Status (Unemployed=1)	647	0.153	0.36	0	1	Unemployed = 1 and Employed/Out-of-labour-force = 0
Age	647	1993	7.303	1956	2002	Year of Birth
Years since arrival for first-time migrants	647	2.292	1.427	0	6	Years in the destination country for first-time migrants
Left children in Cape-Verde	647	0.280	0.449	0	1	Dummy which takes value 1 if the migrant left in Cape-Verde at least one child (0, otherwise)
Sends remittances	647	0.655	0.476	0	1	Dummy which takes value 1 if the migrant sends remittances (0, otherwise)
Works more than 40h per week	647	0.206	0.404	0	1	Dummy which takes value 1 if the migrant works more than 40 hours per week (0 if the migrants works less or 40 hours)

[1] In Appendix B, you may find the Likert Scale and Scores used to calculate the frequency of contact with the immediate family

Table 4 - Effect of Social Networks on Mental Health Indicators – Robustness Checks (Health Status)

		MENTAL HEALTH INDEX			EMOTIONAL DISTRESS			ANXIETY		
		OLS		IV	OLS		IV	OLS		IV
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
FULL SAMPLE	Dest_Network	0.015	0.009	0.035	-0.008	-0.003	-0.036	-0.020**	-0.018*	-0.053*
		(0.009)	(0.008)	(0.029)	(0.008)	(0.007)	(0.028)	(0.010)	(0.009)	(0.033)
	Home_Network	-0.005	-0.006	-0.014	-0.006	-0.006	0.005	0.008	0.0121	0.024*
		(0.011)	(0.010)	(0.013)	(0.010)	(0.009)	(0.013)	(0.011)	(0.011)	(0.015)
	Controls	NO	YES	YES	NO	YES	YES	NO	YES	YES
	Cragg-Donald Wald F-Stat.	-	-	16.646	-	-	16.646	-	-	16.646
	Hansen J Statistic (p-value)	-	-	0.687	-	-	0.912	-	-	0.911
	Observations	647	647	647	647	647	647	647	647	647
		OLS		IV	OLS		IV	OLS		IV
		(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
MALE ONLY	Dest_Network	0.003	0.004	0.011	-0.001	-0.002	0.014	-0.019	-0.0205	-0.056
		(0.011)	(0.012)	(0.037)	(0.010)	(0.010)	(0.037)	(0.013)	(0.013)	(0.042)
	Home_Network	0.008	0.014	0.012	-0.021*	-0.026**	-0.032*	0.002	-0.003	0.010
		(0.012)	(0.011)	(0.017)	(0.012)	(0.010)	(0.017)	(0.012)	(0.012)	(0.019)
	Controls	NO	YES	YES	NO	YES	YES	NO	YES	YES
	Cragg-Donald Wald F-Stat.	-	-	10.839	-	-	10.839	-	-	10.839
	Hansen J Statistic (p-value)	-	-	0.771	-	-	0.873	-	-	0.955
	Observations	277	277	277	277	277	277	277	277	277
		OLS		IV	OLS		IV	OLS		IV
		(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
FEMALE ONLY	Dest_Network	0.018	0.013	0.064	-0.010	-0.004	-0.106**	-0.016	-0.015	-0.059
		(0.012)	(0.013)	(0.049)	(0.010)	(0.011)	(0.050)	(0.014)	(0.014)	(0.051)
	Home_Network	-0.026*	-0.025	-0.039**	0.016	0.015	0.043**	0.025	0.027	0.039*
		(0.015)	(0.015)	(0.020)	(0.012)	(0.012)	(0.020)	(0.017)	(0.017)	(0.022)
	Controls	NO	YES	YES	NO	YES	YES	NO	YES	YES
	Cragg-Donald Wald F-Stat.	-	-	11.779	-	-	11.779	-	-	11.779
	Hansen J Statistic (p-value)	-	-	0.4742	-	-	0.800	-	-	0.935
	Observations	370	370	370	370	370	370	370	370	370

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; The outcomes are measured from a scale of 1-5. Destination and Home networks are measured as the size of the network. Networks are winsorized at the 1% level. We controlled for years of schooling; whether the migrant is married with spouse living abroad; whether the person was unemployed (unemployed=1), age (measured as birth year); years since migration if the migrant is a first-time migrant; and, health status; also. for the total sample, we controlled for gender (female=1).

Table 5 - Effect of Social Networks on Mental Health Indicators – Robustness Checks (Children + Remittances)

		MENTAL HEALTH INDEX			EMOTIONAL DISTRESS			ANXIETY		
		OLS		IV	OLS		IV	OLS		IV
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
FULL SAMPLE	Dest_Network	0.015	0.007	0.030	-0.008	-0.001	-0.033	-0.020**	-0.016*	-0.052
		(0.009)	(0.008)	(0.030)	(0.008)	(0.007)	(0.029)	(0.010)	(0.010)	(0.033)
	Home_Network	-0.005	-0.003	-0.011	-0.006	-0.008	0.002	0.009	0.010	0.022
		(0.011)	(0.010)	(0.014)	(0.010)	(0.009)	(0.013)	(0.011)	(0.010)	(0.015)
	Controls	NO	YES	YES	NO	YES	YES	NO	YES	YES
	Cragg-Donald Wald F-Stat.	-	-	15.384	-	-	15.384	-	-	15.384
	Hansen J Statistic (p-value)	-	-	0.665	-	-	0.914	-	-	0.895
	Observations	647	647	647	647	647	647	647	647	647
		OLS		IV	OLS		IV	OLS		IV
		(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
MALE ONLY	Dest_Network	0.003	0.005	0.002	-0.001	-0.002	0.014	-0.019	-0.024*	-0.047
		(0.011)	(0.011)	(0.037)	(0.010)	(0.010)	(0.037)	(0.014)	(0.013)	(0.044)
	Home_Network	0.008	0.014	0.015	-0.021*	-0.026**	-0.032*	0.002	-0.001	0.007
		(0.012)	(0.011)	(0.017)	(0.012)	(0.010)	(0.017)	(0.012)	(0.012)	(0.019)
	Controls	NO	YES	YES	NO	YES	YES	NO	YES	YES
	Cragg-Donald Wald F-Stat.	-	-	10.549	-	-	10.549	-	-	10.549
	Hansen J Statistic (p-value)	-	-	0.625	-	-	0.793	-	-	0.820
	Observations	277	277	277	277	277	277	277	277	277
		OLS		IV	OLS		IV	OLS		IV
		(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
FEMALE ONLY	Dest_Network	0.018	0.010	0.054	-0.010	-0.001	-0.093*	-0.016	-0.012	-0.052
		(0.012)	(0.012)	(0.049)	(0.010)	(0.010)	(0.051)	(0.014)	(0.014)	(0.052)
	Home_Network	-0.026*	-0.021	-0.034**	0.016	0.012	0.039*	0.025	0.023	0.034
		(0.015)	(0.015)	(0.020)	(0.012)	(0.012)	(0.020)	(0.017)	(0.018)	(0.023)
	Controls	NO	YES	YES	NO	YES	YES	NO	YES	YES
	Cragg-Donald Wald F-Stat.	-	-	10.732	-	-	10.732	-	-	10.732
	Hansen J Statistic (p-value)	-	-	0.323	-	-	0.826	-	-	0.823
	Observations	370	370	370	370	370	370	370	370	370

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; The outcomes are measured from a scale of 1-5. Destination and Home networks are measured as the size of the network. Networks are winsorized at the 1% level. We controlled for years of schooling; whether the migrant is married with spouse living abroad; whether the person was unemployed (unemployed=1), age (measured as birth year); years since migration if the migrant is a first-time migrant; whether the migrant left-behind children in Cape-Verde; and if he/she send remittances; also. for the total sample, we controlled for gender (female=1).

Table 6 - Effect of Social Networks on Mental Health Indicators – Robustness Checks (Works more than 40 hours per week)

		MENTAL HEALTH INDEX			EMOTIONAL DISTRESS			ANXIETY		
		OLS		IV	OLS		IV	OLS		IV
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
FULL SAMPLE	Dest_Network	0.015	0.009	0.033	-0.008	-0.003	-0.035	-0.020**	-0.018*	-0.054*
		(0.009)	(0.008)	(0.029)	(0.008)	(0.007)	(0.029)	(0.010)	(0.009)	(0.032)
	Home_Network	-0.005	-0.006	-0.014	-0.006	-0.006	0.004	0.008	0.0121	0.024*
		(0.011)	(0.010)	(0.013)	(0.010)	(0.009)	(0.013)	(0.011)	(0.011)	(0.014)
	Controls	NO	YES	YES	NO	YES	YES	NO	YES	YES
	Cragg-Donald Wald F-Stat.	-	-	16.838	-	-	16.838	-	-	16.838
	Hansen J Statistic (p-value)	-	-	0.698	-	-	0.944	-	-	0.900
	Observations	647	647	647	647	647	647	647	647	647
		OLS		IV	OLS		IV	OLS		IV
		(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
MALE ONLY	Dest_Network	0.003	0.003	-0.001	-0.001	-0.002	0.019	-0.019	-0.019	-0.043
		(0.011)	(0.011)	(0.036)	(0.010)	(0.010)	(0.036)	(0.013)	(0.012)	(0.043)
	Home_Network	0.008	0.014	0.015	-0.021*	-0.025**	-0.033**	0.002	-0.002	0.006
		(0.012)	(0.011)	(0.017)	(0.012)	(0.010)	(0.017)	(0.012)	(0.012)	(0.019)
	Controls	NO	YES	YES	NO	YES	YES	NO	YES	YES
	Cragg-Donald Wald F-Stat.	-	-	11.278	-	-	11.278	-	-	11.278
	Hansen J Statistic (p-value)	-	-	0.558	-	-	0.668	-	-	0.775
	Observations	277	277	277	277	277	277	277	277	277
		OLS		IV	OLS		IV	OLS		IV
		(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
FEMALE ONLY	Dest_Network	0.018	0.013	0.067	-0.010	-0.004	-0.102**	-0.016	-0.016	-0.065
		(0.012)	(0.013)	(0.049)	(0.010)	(0.015)	(0.050)	(0.014)	(0.014)	(0.051)
	Home_Network	-0.026*	-0.025	-0.040**	0.016	0.015	0.042**	0.025	0.027	0.041*
		(0.015)	(0.015)	(0.020)	(0.012)	(0.012)	(0.020)	(0.017)	(0.017)	(0.022)
	Controls	NO	YES	YES	NO	YES	YES	NO	YES	YES
	Cragg-Donald Wald F-Stat.	-	-	11.947	-	-	11.947	-	-	11.947
	Hansen J Statistic (p-value)	-	-	0.409	-	-	0.793	-	-	0.939
	Observations	370	370	370	370	370	370	370	370	370

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; The outcomes are measured from a scale of 1-5. Destination and Home networks are measured as the size of the network. Networks are winsorized at the 1% level. We controlled for years of schooling; whether the migrant is married with spouse living abroad; whether the person was worked more than 40 weekly hours; age (measured as birth year); years since migration if the migrant is a first-time migrant; also. for the total sample, we controlled for gender (female=1).

Table 7 - Effect of Social Networks on Mental Health Indicators – Robustness Checks – Mechanism – Home Network

		MENTAL HEALTH INDEX			EMOTIONAL DISTRESS			ANXIETY		
		OLS		IV	OLS		IV	OLS		IV
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
FULL SAMPLE	Dest_Network	0.013	0.008	0.029	-0.009	-0.004	-0.032	-0.018*	-0.016*	-0.049*
		(0.009)	(0.008)	(0.027)	(0.008)	(0.007)	(0.026)	(0.009)	(0.009)	(0.030)
	Home_Network	0.026	0.022	0.025	0.0402	0.040	0.037	-0.026	-0.025	-0.029
		(0.042)	(0.037)	(0.037)	(0.046)	(0.042)	(0.042)	(0.049)	(0.043)	(0.043)
	Controls	NO	YES	YES	NO	YES	YES	NO	YES	YES
	Cragg-Donald Wald F-Stat.	-	-	18.020	-	-	18.020	-	-	18.020
	Hansen J Statistic (p-value)	-	-	0.640	-	-	0.930	-	-	0.886
	Observations	648	648	648	648	648	648	648	648	648
		OLS		IV	OLS		IV	OLS		IV
		(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
MALE ONLY	Dest_Network	0.007	0.010	0.004	-0.008	-0.011	0.010	-0.021*	-0.023**	-0.035
		(0.011)	(0.011)	(0.032)	(0.011)	(0.010)	(0.033)	(0.012)	(0.012)	(0.037)
	Home_Network	0.067	0.091*	0.088*	-0.062	-0.069	-0.058	-0.101*	-0.133**	-0.140**
		(0.046)	(0.049)	(0.050)	(0.048)	(0.048)	(0.048)	(0.057)	(0.061)	(0.062)
	Controls	NO	YES	YES	NO	YES	YES	NO	YES	YES
	Cragg-Donald Wald F-Stat.	-	-	13.182	-	-	13.182	-	-	13.182
	Hansen J Statistic (p-value)	-	-	0.572	-	-	0.756	-	-	0.979
	Observations	276	276	276	276	276	276	276	276	276
		OLS		IV	OLS		IV	OLS		IV
		(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
FEMALE ONLY	Dest_Network	0.014	0.009	0.067	-0.008	-0.002	-0.098**	-0.013	-0.012	-0.067
		(0.015)	(0.011)	(0.049)	(0.010)	(0.010)	(0.047)	(0.013)	(0.013)	(0.049)
	Home_Network	-0.047	-0.024	-0.030	0.135**	0.117**	0.126**	0.062	0.043	0.049
		(0.048)	(0.049)	(0.048)	(0.053)	(0.051)	(0.055)	(0.051)	(0.051)	(0.051)
	Controls	NO	YES	YES	NO	YES	YES	NO	YES	YES
	Cragg-Donald Wald F-Stat.	-	-	11.910	-	-	11.910	-	-	11.910
	Hansen J Statistic (p-value)	-	-	0.501	-	-	0.567	-	-	0.889
	Observations	372	372	372	372	372	372	372	372	372

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; The outcomes are measured from a scale of 1-5. Home Network is measured as the frequency of contact with the immediate family in Cape-Verde (parents, spouses and/or children). We controlled for years of schooling; whether the migrant is married with spouse living abroad; whether the person was unemployed (unemployed=1), age (measured as birth year) and years since migration if the migrant is a first-time migrant; also. for the total sample, we controlled for gender (female=1).

Table 8 - Effect of Social Networks on Mental Health Indicators – Robustness Checks – Mechanism – Home Network (Children + Remittances)

		MENTAL HEALTH INDEX			EMOTIONAL DISTRESS			ANXIETY		
		OLS		IV	OLS		IV	OLS		IV
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	12.471
FULL SAMPLE	Dest_Network	0.013	0.007	0.027	-0.009	-0.003	-0.030	-0.018*	-0.015*	-0.047
		(0.009)	(0.008)	(0.028)	(0.008)	(0.007)	(0.027)	(0.009)	(0.009)	(0.031)
	Home_Network	0.026	0.019	0.020	0.040	0.042	0.039	-0.026	-0.021	-0.024
		(0.042)	(0.036)	(0.036)	(0.046)	(0.042)	(0.042)	(0.049)	(0.042)	(0.043)
	Controls	NO	YES	YES	NO	YES	YES	NO	YES	YES
	Cragg-Donald Wald F-Stat.	-	-	16.689	-	-	16.689	-	-	16.689
	Hansen J Statistic (p-value)	-	-	0.598	-	-	0.929	-	-	0.875
	Observations	648	648	648	648	648	648	648	648	648
		OLS		IV	OLS		IV	OLS		IV
		(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
MALE ONLY	Dest_Network	0.007	0.012	0.006	-0.008	-0.014	0.007	-0.021*	-0.026**	-0.039
		(0.011)	(0.011)	(0.033)	(0.011)	(0.010)	(0.034)	(0.012)	(0.011)	(0.038)
	Home_Network	0.067	0.083*	0.081*	-0.062	-0.057	-0.048	-0.101*	-0.125**	-0.130**
		(0.046)	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)	(0.057)	(0.060)	(0.060)
	Controls	NO	YES	YES	NO	YES	YES	NO	YES	YES
	Cragg-Donald Wald F-Stat.	-	-	12.471	-	-	12.471	-	-	12.471
	Hansen J Statistic (p-value)	-	-	0.530	-	-	0.689	-	-	0.930
	Observations	276	276	276	276	276	276	276	276	276
		OLS		IV	OLS		IV	OLS		IV
		(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
FEMALE ONLY	Dest_Network	0.014	0.006	0.052	-0.007	0.000(0.0	-0.086*	-0.013	-0.009	-0.054
		(0.012)	(0.011)	(0.048)	(0.009)	10)	(0.048)	(0.013)	(0.013)	(0.050)
	Home_Network	-0.053	-0.030	-0.034	0.136**	0.118**	0.126**	0.063	0.048	0.053
		(0.048)	(0.049)	(0.047)	(0.053)	(0.050)	(0.053)	(0.051)	(0.050)	(0.050)
	Controls	NO	YES	YES	NO	YES	YES	NO	YES	YES
	Cragg-Donald Wald F-Stat.	-	-	10.796	-	-	10.796	-	-	10.796
	Hansen J Statistic (p-value)	-	-	0.353	-	-	0.681	-	-	0.954
	Observations	372	372	372	372	372	372	372	372	372

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; The outcomes are measured from a scale of 1-5. Home Network is measured as the frequency of contact with the immediate family in Cape-Verde (parents, spouses and/or children). We controlled for years of schooling; whether the migrant is married with spouse living abroad; whether the person was unemployed (unemployed=1), age (measured as birth year) and years since migration if the migrant is a first-time migrant; whether the migrant sends remittances; and whether the migrant has children in Cape-Verde; also. for the total sample, we controlled for gender (female=1).

APPENDIX B – DATA AND QUESTIONNAIRE

1. Mental Health Questionnaire

Statements:

a) *Sadness about past:* I get very sad when I remember bad things from the past.

b) *Difficult life:* I find life hard, even when I am at home or somewhere else.

c) *Sadness:* I feel sad most of the time.

d) *Bad Thoughts:* I think about bad things from the past.

e) *Unable to rest:* There are nights when I can't rest.

f) *Chest pain:* I feel chest pains when I'm thinking a lot or worried about something.

g) *Difficulty in concentrating*: I have trouble concentrating.

h) *Anxiety tremors:* My body shakes uncontrollably when I am thinking a lot or worried about something.

i) *Helplessness:* I feel helpless.

Answers - Likert Scale:

(1) Completely Disagree (2) Disagree (3) Do not agree nor disagree (4) Agree (5) Completely Agree

Main outcomes generated:

Mental Health Index: All statements were used to calculate the overall mental health index. To be able to create a positive index, i.e., the highest value of the mental health index would be associated with better mental well-being, we inverted the scale of the Likert Scores. Then, based on the respondent answers, we computed a simple average of the values attributed to each statement.

Similar to the subdivision performed on the BDI-II Index, we divide the mental health index into two-subdivisions to better understand the effects of social networks: (1) An index comprised of the emotional component of mental health problems and, (2) a physical component.

Emotional Distress: Only statements a), b), c), d) and i) were used to compute the emotional distress index. This index includes all statements related to the affective components of the questionnaire – namely, regarding emotions and signs of depression. We do not perform any alteration to the Likert Scale in this dimension, therefore, a higher value will translate into a higher emotional distress.

Anxiety: The remaining statements - e), f), g) and h) - were used to compute the anxiety level which includes all statements which are associated with physiological feelings associated with anxiety. Similarly, to the previous dimension, we did not alter the Likert Scale and, consequently, higher values are associated with greater anxiety.

2. Frequency of Contact Question

- How often do you get in touch with the [*first name of the friend/relative*]?

(1) Every day (2) At least two or three times per week (3) Every week (4) At least twice or three times per months (5) Every month (6) At least two or three times per year (7) Annually or occasionally (99) Prefers not to answer/Does not know [*The interviewer would not read this last option and, during data cleaning this value was transformed into missing value*]

How did we generated the frequency of contact variable used in this analysis?

First, we inverted the scale of the answers so that the higher value would be associated with the highest frequency of contact; we did this to mainly ease interpretation. Secondly, we generated a simple average of the Likert Scores attributed to each answer given by the respondent on the

frequency of contact with his/her immediate family which consists of the migrant's parents, spouses and/or children.