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Article

Mental health of sub-saharan african migrants: The gendered role of migration paths and transnational ties

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ABSTRACT

In Europe, migrants are at higher risk of common mental disorders or psychological distress than are natives. Little is known regarding the social determinants of migrant mental health, particularly the roles played by migration conditions and transnational practices, which may manifest themselves in different ways for men and for women. The goal of this paper was to understand the gendered roles of migration paths and transnational ties in mental health among sub-Saharan African migrants residing in the Paris, France, metropolitan area. This study used data from the Parcours study conducted in 2012–2013, which employed a life-event approach to collect data from a representative sample of migrants who visited healthcare facilities (n = 2468). We measured anxiety and depressive symptoms at the time of data collection with the Patient Health Questionnaire-4 (PHQ-4). Reasons for migration, the living conditions in the host country and transnational ties after migration were taken into account by sex and after adjustment. Our study demonstrates that among sub-Saharan African migrants, mental health is related to the migratory path and the migrant's situation in the host country but differently for women and men. Among women, anxiety and depressive symptoms were strongly related to having left one's home country because of threats to one's life. Among men, residing illegally in the host country was related to impaired mental health. For both women and men, cross-border separation from a child less than 18 years old was not independently associated with anxiety and depressive symptoms. In addition, social and emotional support from relatives and friends—both from the society of origin and of destination—were associated with lower anxiety and depressive symptoms. Migrant mental health may be impaired in the current context of anti-migrant policies and an anti-immigrant social environment in Europe.

Introduction

The increasingly anti-migrant policies and anti-immigrant social environment worldwide have raised concerns regarding their mental-health impact. Additionally, evidence indicates that migrants in Europe are at higher risk of depression and anxiety than are native-born Europeans (Levecque, Lodewyckx, & Vranken, 2007; Levecque & Van Rossem, 2015; Tinghög, Hemmingsson, & Lundberg, 2007). However, little is known regarding the social determinants of mental health among migrants. Studies have found that lower socio-economic status and experiencing discrimination in employment or housing are associated with a higher risk of anxiety and depressive disorders among non-European migrants (Thapa & Hauff, 2005; Wittig, Lindert, Merbach, & Brähler, 2008). However, these studies did not account for the conditions of migration, which may play an important role in migrant mental health and which may act differently for men and women. In addition, cross-border family separation and relations with those left behind may influence migrant mental health in destination societies. To date, few studies have considered the impact transnational ties may have on migrant mental health. Finally, because gender affects the human life and migration experiences, its role should be more systematically examined while investigating the social determinants of migrant health. The goal of this paper is to understand the role of migration paths and transnational ties in mental health among sub-Saharan African migrant women and men residing in the Paris, France, metropolitan area.

Sub-saharan african migrants in France

In France, sub-Saharan African migrants are the second-largest migrant group after migrants from Maghreb (Algeria, Morocco, Tunisia). In 2012, they represented approximately 13% of migrants in France and 1% of the French population. The primary place of origin of these individuals is West and Central Africa, and 60% reside in the Paris

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metropolitan area (INSEE, 2011). Sub-Saharan African migrants living in France constitute a heterogeneous population, with some having a relatively high level of education compared to migrants from other regions (Ichou and Goujon, 2017). However, they are particularly affected by unemployment. Additionally, many earn their livelihoods through menial occupations or undeclared employment (Annequin, Gosselin, & Dray-Spira, 2017). In addition, migrants from Sub-Saharan Africa face more discrimination than migrants from other regions (Beauchemin, Hamel, & Simon, 2015). Compared to natives, sub-Saharan African women and men migrants have an increased risk of hospital admission for psychosis (Tortelli et al., 2014).

Since the mid-1970s, French immigration policies and laws have become stricter, first limiting the flow of migrant labor and subsequently progressively restricting family reunification, in accordance with the general European context (Block & Bonjour, 2013). For many migrants, arrival in France is a time of legal insecurity. On average, after arrival, it requires 3 years for women and 4 years for men to obtain a residence permit valid for at least a year (Gosselin, Desgrées-du-Loû, Lelièvre, Dray-Spira, & Lydié, 2016). Recently, the French Defender of Rights has denounced discrimination regarding access to administrative rights for migrants (i.e., excessive requirements to comply with immigration regulations) (Defender of Rights, 2016), which may represent an important source of stress. The migration profiles of women and men are becoming more similar than previously. Women increasingly migrate to find employment, to pursue their education (Beauchemin, Borrel, & Régnard, 2013) and—more recently—to flee threats in their country of origin (Gosselin et al., 2016). Forced migration is accompanied by an increased risk of sexual violence (Pannetier, Ravalihasy, & Desgrées-du-Loû, 2017), with potential consequences for mental health.

At a time when forced migration is increasing among sub-Saharan African migrants and given the difficult political and social environment that sub-Saharan African migrants face in Europe, there is a need to understand the influence of the migratory path and living conditions in France on migrant mental health.

Mental health and the migration path

To date, research on migrant health has favored acculturation frameworks. These frameworks have been challenged (Castañeda, Holmes, Madrigal, Young, Beyeler & Quesada, 2015; Viruell-Fuentes, Miranda, & Abdulrahim, 2012), and scholars have increasingly investigated how the social and political context of the home and destination society can affect migrant health.

For migrants, the economic and political context of their home and destination societies may result in an accumulation of stressors over their lifetimes. Studies conducted in the US on Latino migrants have demonstrated that exposure to political violence in the country of origin has a persistent effect on post-migration mental health (Fortuna, Porche, & Alegria, 2008; Ornelas & Perreira, 2011) and that unplanned migration was related to psychological distress for women (Torres & Wallace, 2013). Studies on refugees in Europe have found that psychological problems were related not only to pre-migration traumatic life events but also to living conditions in the host country, in particular the delay or absence of a residence permit (Lamkaddem, Essink-Bot, Devillé, Gerritsen, & Stronks, 2015; Warfa, Curtis, Watters, Carswell, Ingleby & Bhui, 2012).

Additionally, processes by which the host states themselves produce undocumented migrants by creating obstacles to visa extensions or refugee status may impact migrant mental health (Larchanché, 2012; Willen, 2012). A qualitative study has demonstrated than the state production of illegality was different for women and men (Sargent & Larchanché-Kim, 2006). Despite this evidence, the inclusion of legal-status measures in migrant health studies remains limited (Torres & Young, 2016).

Researchers have emphasized that studies on migrant health would benefit from considering "social determinants of health" in both the migrant's origin and destination societies (Acevedo-Garcia, Sanchez-Vaznaugh, Viruell-Fuentes, & Almeida, 2012; Zimmerman, Kiss, & Hossain, 2011). However, this approach is rarely adopted. Only, one study demonstrates that among Latino migrants to the US, migration to escape violence or persecution and post-migration discrimination were strongly associated with increased depressive symptoms (Ornelas & Perreira, 2011). Therefore, there is a need to examine the role of pre- and post-migration-related stressors on migrant mental health, particularly with respect to migration condition and legal status in the destination country, while accounting for gender specificities.

Transnational ties and mental health

An emerging body of literature that analyzes the impact of transnational ties on migrant mental health indicates that such ties can be both a source of risk and of resilience (Torres, Alcántara, Rudolph, & Viruell-Fuentes, 2016). To date, most researches on these issues come from the US among Latino migrants. It is therefore interesting to investigate the potential transferability of concepts/hypothesis from the US migration literature in a European context.

Studies have achieved mixed results regarding the impact of cross-border family separation on mental health. A study on Latino migrants in the US found no association between migration-related family stress defined as feeling guilty regarding leaving and having limited contact with family and friends in the country of origin (Torres, Alcántara, et al., 2016). However, among Mexican immigrant mothers, separation from children and spouses has been shown to contribute to depression (Ornelas & Perreira, 2011). Among young Latino adults in the US, cross-border separation from parents during childhood was associated with poorer self-rated health (Torres, 2013). Among several transnational ties, separation from family members was the primary predictor of poorer self-reported health outcomes for sub-Saharan African women residing in France (Afulani, Torres, Sudhinaraset, & Asunka, 2016).

In addition, to date, quantitative studies have primarily focused on the impact of the moral obligation of migrants to provide support (i.e., financial or another form of assistance or return visits home) to their relatives in their home country and demonstrated that this obligation can also be a source of stress, especially for women (Samari, 2016; Torres, Lee, González, Garcia, & Haan, 2016, Alcántara, Chen, & Alegría, 2015). The stress may be generated by fulfilling caregiving roles (expected more of women) across borders and/or by the inability to provide financial support to the family left behind. However, the reciprocity of the exchange and the support of family members abroad is rarely assessed in quantitative studies.

In that matter, a qualitative study conducted in Detroit, USA, on Mexican women demonstrated that social support from parents and siblings living abroad helped migrants cope with feelings of isolation and loneliness or anti-migrant sentiment and provided them "an alternative space of belonging" (Viruell-Fuentes & Schulz, 2009). A qualitative study conducted in France on Malians similarly revealed that transnational therapy management (i.e., health-related advice and resources) reinforces affective ties and creates a sense of belonging between migrants and their home-country relatives (Sargent & Larchanché, 2016).

Transnational ties are frequent among sub-Saharan African migrants in France, particularly in the form of financial transfers. Poverty and the social structure of the societies of origin, which are characterized by extended families and community solidarity, cause migrants to engage in their economies (Beauchemin et al., 2015). Also, Sub-Saharan African migrant men may have children and spouses in both the society of destination and the home country, which has been termed transnational polygyny (Kringelbach, 2016).

Objectives

In this study, using data from the Parcours life-event study conducted among sub-Saharan Africa living in France, we investigate the influence of migratory paths and transnational ties on women and men migrant mental health. In Europe, migrants from sub-Saharan Africa are particularly affected by hepatitis B and C and by human immunodeficiency virus (HIV) (Desgrées-du-Loû et al., 2015; Rice, Elford, Yin, & Delpech, 2012). Consequently, specific surveys have been conducted in France to understand the conditions of migrants living with HIV and hepatitis B (Annequin, Lert, Spire, Dray-Spira, & VESPA2 Study Group, 2015; Desgrées-du-Loû et al., 2016). The Parcours life-event study was conducted among three groups of sub-Saharan migrants, one group living with HIV, one group living with chronic hepatitis B and one group free from these infections. This study allows to compare mental health between these groups and it includes a rich set of measures of pre and post-migration experiences, including two measures reflecting cross-border family connection and separation. It therefore represents a unique opportunity to assess the impact of pre and post-migration experiences and transnational ties on migrant mental health in a European context.

Our objectives were the following:

Objective 1: To assess if migratory paths marked by exposure to threats in the country of origin and being undocumented in the destination country were associated with symptoms of anxiety and depression, for women and men separately.

Objective 2: To assess if cross-border ties with relatives and friends and separation with a child were associated with symptoms of anxiety and depression, for women and men separately.

Methods

The ANRS-Parcours study was conducted on migrants born in sub-Saharan Africa who were residing in the greater Paris metropolitan area. The survey was conducted between February 2012 and May 2013 on 2468 individuals visiting 74 healthcare facilities: one group was visiting primary-care centers, one group was receiving HIV care, and one group had CHB (but was not HIV positive). The study used time-location sampling (Magnani, Sabin, Saidel, & Heckathorn, 2005), in which healthcare facilities were randomly selected from three exhaustive lists of primary-care centers (including primary-care centers for vulnerable populations), HIV outpatient hospital clinics and hepatitis treatment clinics. We constructed three distinct sampling frames (one for each healthcare specialty) by each half-day that the healthcare facilities were open. All eligible patient visits were included from each healthcare facility and each half-day time interval. To construct a sample that reflected the contribution of the various types of healthcare facility found in Île-de-France, the number of individuals to include from each facility was determined according to the group's weight within the total population of migrants from sub-Saharan Africa in the Paris metropolitan era. The data were weighted according to each individual's probability of inclusion in the survey.

Patients were eligible if they were born in sub-Saharan Africa, were citizens of a sub-Saharan African country at birth, were between 18 and 59 years old, and had not been diagnosed with either HIV or hepatitis B (for the primary-care group) or had been diagnosed with HIV infection or chronic hepatitis B (the other two groups) for at least 3 months. Recruitment occurred at the healthcare facilities. Physicians asked their eligible patients to participate and acquired their written consent. A trained interviewer administered a face-to-face standardized life-event history questionnaire to each participant. Professional interpreters were available on demand. The interviews were primarily conducted in French. Only 23 interviews were conducted in another language. All information was collected anonymously. More detailed information regarding recruitment, the refusal rate and non-respondent characteristics has been presented elsewhere (Desgrées-du-Loû et al., 2016). We excluded 26 individuals with missing data from the analyses.

The participants received 15 € vouchers. The project was approved by the Advisory Committee on Data Collection in Health Research (CCTIRS) and the French Data Protection Authority (CNIL). The complete survey protocol is registered at Clinicaltrials.gov (NCT02566148, **https://clinicaltrials.gov/ct2/show/**NCT02566148).

Variables of interest

Mental-health outcomes

Anxiety and depressive symptoms at time of data collection were measured with the Patient Health Questionnaire-4 (PHQ-4), a validated measure of these two disorders (Kroenke, Spitzer, Williams, & Löwe, 2009; Löwe et al., 2010). Because anxiety and depression are frequently comorbid, the PHQ-4 was developed to conduct routine screenings for anxiety and depressive symptoms in clinic settings (Kroenke et al., 2009; Löwe et al., 2010). The PHQ-4 contains the 2-item anxiety scale GAD-2 and the 2-item depression scale PHQ-2, which are valid and reliable short forms of validated scales that measure anxiety (GAD-7) and depression (PHQ-9), respectively (Kroenke, Spitzer, & Williams, 2003; Kroenke, Spitzer, Williams, Monahan, & Löwe, 2007). Participants were asked to indicate how often they had been bothered by the following problems during the preceding 2 weeks: little interest or joy in their activities; depression, melancholy or hopelessness; nervousness, fear or irritation; and the feeling of being unable to stop worrying. The response options for each item were not at all (0), several days (1), more than half the days (2) or nearly every day (3). The PHQ-4 total score ranged from 0 to 12. The Cronbach's alpha coefficients were at least 0.81 for each group. Based on Lowe's recommendations, we used a cut-off score: 6 or higher indicated mild to severe anxiety and depressive symptomatology that merited further evaluation by a physician (Löwe et al., 2010). Consistent with previous research (Kroenke et al., 2007), we replaced missing values of a scale with the mean value of the remaining items when 25% or fewer items were missing (n = 50). If more than 25% of items were missing, the sum score was not computed and was counted as missing (n = 20).

Pre- and post-migration-related stressors

We considered migration motivated by a threat to one's life as a proxy of exposure to interpersonal and/or political violence in the country of origin, and then as a potential pre-migration related stressor. Therefore, we distinguished exposure to threats from other reasons for migration, such as medical treatment, seeking employment or "taking a chance", study abroad or joining a family member.

We considered that to be undocumented at the time of the interview as a potential post-migration related stressor. Therefore, we distinguished having no residence permit from having a short-term residence permit (1 to 3 years) and having a long-term residence permit (10-year resident card or French nationality).

Transnational ties

Our data also enabled us to consider one form of cross-border separation: having a child less than 18 years old who lives in a different country. Cross-border family support was measured using the following question: "Currently, do you have someone close to you whom you can rely on in times of hardship?" The response options were as follows: "Yes, in France", "Yes, in my country of origin", "Yes, both in France and in my country of origin" and "No".

Control variables

Socio-demographic characteristics and factors known to be associated with poor mental health in the general population and among migrants (Agyekum and Newbold, 2016; Kessler and Bromet, 2013;

Macdowall et al., 2013; Pan Ké Shon & Duthé, 2013) were introduced as control variables. We considered the following as control variables: age at interview (25–34, 35–44, 45–60 years), educational level (secondary or higher *vs.* primary or none), occupational status based on the International Standard Classification of Occupations (elementary occupation, intermediary/superior occupation, unemployed or inactive, student), time since arrival in France based on the average time required to become settled (Gosselin et al., 2016) (0–6 years, 7 years and more), living in a stable relationship (yes *vs.* no) and religious practice (regular *vs.* irregular). We also considered two life events that are known to impact mental health as control variables: having experienced homelessness in France and having experienced forced sexual relation (s) through life.

Analysis

The sociodemographic characteristics of migrants, pre- and post-migration social determinants, transnational ties and mental-health outcomes were compared by study group (HIV, hepatitis B and primary care). Weights were applied to all the percentages. The proportions were compared using design-based chi-square tests, mean scores were compared with log linear regressions, and medians were compared with quantile regressions using a robust variance estimator. The factors associated with anxiety/depressive symptoms were examined using univariate and multivariate design-based logistic regression models. For the modeling, the three study groups were gathered into a single pooled sample, and the observations were weighted so that each group would have the same re-weighted sample size. All the models were adjusted for each study group. To ensure that the associations found between the pre- and post-migration-related stressors, transnational ties and mental-health outcomes were robust and not due to over control or countervailing positive factors, the association were separately entered into four models adjusted for control variables. To determine whether the associations found for anxiety and depressive symptoms were robust, all analyses were computed using the PHQ-4 total score as a continuous variable, with multivariate log linear regression models. All analyses were performed in Stata SE 13.1 (Stata Corporation, College Station, Texas, USA).

Results

Migration because of a threat to one's life, legal status and transnational ties

Most of the migrants (> 95%) came from former French colonies in Western and Central Africa. Côte d'Ivoire, Cameroon, Mali, the Democratic Republic of the Congo, and Senegal were the most frequent countries of origin (data not shown). The median duration of residence in France was 13 years for women and 12 years for men in the primary-care group. The other groups did not differ significantly. Migration because of a threat to one's life in the country of origin was applied to 17% of the women and 24% of the men in the primary-care group, and the percentages were higher in this group. The proportion of women who migrated to France under these circumstances (fleeing under a threat) increased from 13% among those who arrived before 2005 to 32% among those who arrived after 2005 (data not shown). The proportion of women who were subjected to forced sex was high: 21% in the primary-care group; the other groups did not differ significantly. A significant proportion of migrants had no residence permit at the time of the interview, particularly men: 20% in the primary-care group, with no significant differences between groups (Table 1).

Having a child in another country was more than twice as likely for men than for women: 33% and 15% in the primary-care group, respectively. The other groups did not differ significantly. Most migrants had someone to rely on in both their home and destination country: 72% for women and 65% for men in the primary-care group (Table 1).

Anxiety and depressive symptoms and their relation to factors known be associated with depression

Higher levels of anxiety and depressive symptoms were found in women than men. A total of 24% of women and 18% of men reported anxiety or depressive symptoms in the primary-care group, and there were no significant differences between groups (Table 1). As shown in Table 2, the likelihood of anxiety and depressive symptoms was higher for women and men who had experienced forced sex (OR = 1.5[CI = 1.0–2.2], OR = 2.6[CI = 1.1–6.2], respectively) or homelessness (OR = 2.3[CI = 1.3–4.3], OR = 2.35[CI = 1.4–4.5], respectively) and for those who were unemployed at the time of the survey (OR = 3.4[CI = 2.5–5.9], OR = 1.9[CI = 1.0–3.4], respectively) or employed in an elementary occupation for women (OR = 1.6[CI = 1.1–2.5]). The likelihood of anxiety and depressive symptoms decreased with age, time spent in France (particularly for men), among those living in a stable relationship, and (for men only) among those who frequently practiced religion.

Role of threats and illegality: gender differences

As indicated in Table 2, multivariate analyzes indicated that migration motivated by threats was positively associated with anxiety/depressive symptoms for women (OR = 2.3[CI = 1.2–4.6]) but not for men after adjustment for control variables (OR = 1.6[CI = 0.8–3.1]). Having no residence permit was associated with anxiety/depressive symptoms for men (OR = 2.1[CI = 1.2–3.9]) but not for women after adjustment for control variables (OR = 1.3[CI = 0.7–2.3]). These results suggest that for women anxiety/depressive symptoms are associated with threats-related migration and for men they are associated with illegal/undocumented status, after adjusting for control variables.

Role of transnational ties: gender similarities

Having a child of less than 18 years old in the country of origin was not significantly associated with anxiety/depressive symptoms after adjustment for control variables. The probability of having anxiety and depressive symptoms was lower in women and men who had relatives/friends to rely on in both home and host country compared to women and men who had no one close to rely on (OR = 0.5 [CI = 0.3–1.0], OR = 0.5 [CI = 0.3–0.8], respectively). After adjustment, having someone to rely on only in the home country or only in the host country was not associated with a decrease in anxiety/depressive symptoms (Table 2).

Discussion

The design of our study, which considers the entire life course of an individual, is specifically adapted to investigate the role of the migration path by considering both what precedes and what succeeds migration as well as the role played by transnational ties in migrant mental health.

This study is the first to examine anxiety and depressive symptoms among a representative sample of sub-Saharan migrants, including undocumented migrants. It offers more detailed knowledge than population-based studies, in which legal status is difficult to collect because undocumented migrants are less likely to participate in surveys and because those who participate are reluctant to declare undocumented status for fear of being reported to the authorities. Healthcare facilities represent one of the few locations where residence permit information can be collected without the interviewees being afraid to declare it. Given that migrants can access social security coverage and rapidly gain access to healthcare after their arrival (Vignier et al., 2016), our results are likely to apply to the full diversity of sub-Saharan migrants who reside in Île-de-France.

This study demonstrates that levels of anxiety and depressive symptoms were high, possibly because factors known to be related to

Table 1
Socio-demographic characteristics, pre-and post-migration social determinants, transnational social ties and mental health by sex and health care services – ANRS PARCOURS study.

	Women				Men			
	Primary care	**HIV**	**CHB**		**Primary care**	**HIV**	**CHB**	
	N = 405	*N = 568*	*N = 216*		*N = 351*	*N = 349*	*N = 553*	
	Med/%	*Med/%*	*Med/%*	*p*	*Med/%*	*Med/%*	*Med/%*	*p*
Pre-and post-migration related stressors								
Reasons for coming to the host country								
Threat in the home country	17.3	9,8	13,7	0.002	24,1	17,9	17,6	0.036
Medical	3.7	8,4	7,0		1,8	9,2	5,8	
Find a job	19.8	35,2	25,2		37,8	42,9	48,1	
Study	13.0	8,1	6,8		20,6	15,4	16,5	
Family reunion	46.1	38,6	47,3		15,7	14,6	11,9	
Legal status in France								
No residence permit	13.8	6.9	21.8	< 0.001	20.9	10.2	25.8	0.000
Temporary residence permit including 1 or 3 years	24.1	42.5	33.1		27.2	44.6	36.7	
Long residence permit and French-Nationals	62.1	50.5	45.0		51.9	45.3	37.5	
Transnational social ties								
A child of less than 18 years old not in France	15.5	19.6	18.6	0.444	32.5	37.8	33.5	0.527
Someone close to rely on in times of hardship								
In host and home countries	71.8	53.8	67.0	< 0.001	65.2	57.8	65.4	0.116
In the host country only	13.9	23.5	16.5		11.6	23.9	17.6	
In the home country only	6.1	12.2	3.8		9.6	9.3	7.3	
Has no one	8.2	10.5	12.7		13.6	8.9	9.7	
Mental health								
Mild/severe anxiety/depressive symptoms	24.5	31.4	21.7	0.114	17.5	19.6	19.7	0.769
Socio-demographic characteristics								
Age								
18–34	33.9	22.3	38.4	< 0.001	32.7	11.8	32.3	< 0.001
35–44	25.1	47.3	42.4		27.6	31.8	37.7	
45–59	41.0	30.4	19.2		39.7	56.4	30.0	
Median Age	41	40	37	< 0.001	41	47	39	0.009
IQR	(31–50)	(35–46)	(31–43)		(31–50)	(39–52)	(33–46)	
7 years and more since arrival in France	67.8	69.5	53.9	0.020	61.4	73.2	62.5	0.048
Median years in France	13	12	10	< 0.001	12	13	12	< 0.001
IQR	(6–25)	(7–17)	(4–16)		(4–24)	(8–24)	(6–17)	
Secondary/higher educational level	80.1	81.2	78.6	0.769	76.1	80.1	68.1	0.023
Occupational status								
Elementary occupation	39.4	42.4	33.5	0.176	40	44.2	49.2	0.113
intermediary/superior occupation	22.0	16.0	17.2		26.2	28.2	25.3	
Without occupation	33.1	35.0	38.1		27.0	26.1	21.9	
Student	5.5	6.6	11.1		6.9	1.6	3.7	
Stable partnership	51.1	33.6	45.8	0.000	38.1	34.6	38.4	0.713
Regular religious practice	69.7	61.3	71.6	0.042	62.0	55.4	66.8	0.014
Life events								
Experience of forced sex	21.5	25.0	20.7	0.596	2.6	6.4	2.8	0.170
Experience of homelessness	5.5	6.6	3.9	0.591	13.6	10.5	8.7	0.227

Weighted percentages. p value: design-based x2 test comparison of proportion and quantile regression with robust variance estimator for median comparison across groups. log linear regression for mean comparison IQR. interquartile range. CHB. chronic hepatitis B.

depression appeared frequently: unemployment and an elementary occupation, experience of forced sex (particularly for women) and homelessness (more for men). Regarding pre- and post-migration-related stressors, the study reveals that anxiety and depressive symptoms were independently associated with forced migration to escape threats for women and residing illegally in the destination country for men. For both women and men, cross-border separation from a child of less than 18 years old was not independently associated with anxiety and depressive symptoms. For both women and men, social and emotional support from relatives and friends—both in the origin and destination society—was independently associated with a lower level of anxiety and depressive symptoms.

Gender-specific vulnerabilities of the migration path

Exposure to threats in the country of origin was related to anxiety/depressive symptoms for women after adjustment for control variables. This outcome is consistent with a previous study in France that showed high rates of anxiety, depression and post-traumatic stress disorder as well as the experience of political violence (i.e., war rape and torture) among asylum seekers and refugees, particularly among sub-Saharan African women migrants in France (Veïsse, Wolmark, & Revault, 2012). Women who have fled their country of origin because of threats to their lives are more likely to report anxiety/depressive symptoms even after controlling for lifetime experience of forced sex, which means that these women may be exposed to different forms of violence, including gender-based violence, domestic and/or political. Studies have also demonstrated that female refugees and asylum seekers are at high risk of experiencing multiple forms of violence, including sexual violence, both in the country of origin and of destination (Freedman, 2016; Keygnaert, Vettenburg, & Temmerman, 2012) with potential lasting mental-health consequences.

Being undocumented in the destination country was associated with anxiety/depressive symptoms among men after adjustment for control

Table 2
Associated factors to anxiety/depressive symptoms (PHQ-4 of 6 or greater) among women N = 1189 and men N = 1253.

	Women			Men		
	N	Univariate OR [95% CI]	Multivariate ORa [95% CI]	N	Univariate OR [95% CI]	Multivariate ORa [95% CI]
Pre- and post-migration related stressors						
Reasons for coming to France						
Being threatened in their country	168	**3.6***** **[2.1,6.1]**	**2.2*** **[1.1,4.3]**	231	**2.9**** **[1.5,5.6]**	1.5 [0.8,2.8]
Medical reasons	83	**2.5***** **[1.5,4.1]**	**2.3**** **[1.2,4.2]**	72	2.2 [0.9,5.3]	1.2 [0.5,3.2]
Take a chance/find a job	356	1.4 [0.9,2.1]	1.1 [0.7,1.8]	587	1.5 [0.9,2.4]	1.1 [0.6,1.8]
Study reasons	99	1.2 [0.6,2.3]	1.3 [0.6,3.0]	202	0.5 [0.2,1.2]	0.6 [0.3,1.4]
Family reunion	483	Ref.	Ref.	161	Ref.	Ref.
Legal status in France						
No residence permit	177	**2.6***** **[1.5,4.5]**	1.1 [0.5,2.1]	293	**5.0**** **[3.2,7.8]**	**1.9*** **[1.0,3.4]**
Temporary residence permit including 1 or 3 years	435	1.4 [0.9,2.3]	0.6 [0.4,1.2]	445	**2.4**** **[1.5,3.8]**	1.2 [0.8,1.9]
Long residence permit and French-Nationals	577	Ref.	Ref.	515	Ref.	Ref.
Transnational social ties						
A child less than 18 years old not in France (Ref. No)	224	**1.9**** **[1.2,2.8]**	1.0 [0.6,1.6]	455	**1.8**** **[1.2,2.7]**	1.3 [0.9,1.9]
Someone close in times of hardship						
Both in the host and in the country of origin	733	**0.4***** **[0.2,0.6]**	**0.5*** **[0.3,1.0]**	231	**0.3***** **[0.2,0.5]**	**0.5**** **[0.3,0.8]**
Only in host country	220	**0.5*** **[0.3,0.9]**	0.7 [0.4,1.2]	587	0.6 [0.4,1.1]	1.0 [0.6,1.7]
Only in the country of origin	105	1.2 [0.6,2.8]	1.3 [0.5,3.0]	161	1.2 [0.6,2.2]	1.0 [0.6,1.9]
None	130	Ref.	Ref.	202	Ref.	Ref.
Potential confounders						
Age						
18–34	367	**1.8*** **[1.1,2.8]**	1.5 [0.9,2.3]	345	**2.6**** **[1.7,4.1]**	1.0 [0.6,1.9]
35–44	468	1.4 [0.9,2.2]	1.3 [0.8,2.1]	426	**2.3**** **[1.4,3.7]**	1.4 [0.8,2.3]
45–59	354	1.0 [1.0,1.0]	1.0 [1.0,1.0]	482	1.0 [1.0,1.0]	1.0 [1.0,1.0]
7 years and more since arrival in France (Ref. No)	751	**0.5***** **[0.3,0.7]**	0.7 [0.5,1.1]	789	**0.3***** **[0.2,0.5]**	0.7 [0.4,1.2]
Secondary and higher educational level	953	1.1 [0.7,1.6]	1.0 [0.7,1.5]	912	**0.9 [0.5,1.7]**	1.1 [0.6,2.0]
Occupational status						
Elementary occupation	471	**1.6*** **[1.1,2.5]**	**1.6*** **[1.1,2.5]**	570	**1.8*** **[1.1,2.9]**	1.2 [0.7,2.1]
intermediary/superior occupation	214	Ref.	Ref.	304	Ref.	Ref.
Without occupation	431	**4.3***** **[2.6,7.0]**	**3.4***** **[2.0,5.9]**	330	**4.1***** **[2.5,6.8]**	**1.9*** **[1.0,3.4]**
Student	73	**2.7*** **[1.0,7.1]**	2.5 [1.0,6.7]	49	1.6 [0.6,4.2]	1.4 [0.5,3.9]
In a stable partnership (Ref. No)	457	**0.5**** **[0.3,0.7]**	0.8 [0.6,1.2]	468	**0.5**** **[0.3,0.6]**	0.8 [0.6,1.3]
Regular religious practice (ref. No)	775	1.0 [0.6,1.6]	0.9 [0.6,1.4]	786	**0.7*** **[0.5,0.9]**	0.7 [0.5,1.0]
Experience of forced sex (ref. No)	313	**2.1**** **[1.4,3.1]**	**1.5*** **[1.0,2.2]**	45	**4.8**** **[2.2,10.6]**	**2.6*** **[1.1,6.2]**
Experience of homelessness	78	**3.8**** **[2.0,7.3]**	**2.3**** **[1.3,4.3]**	144	**5.1**** **[3.0,8.8]**	**2.5**** **[1.4,4.5]**
Groups						
Primary care	405	1.0 [1.0,1.0]	1.0 [1.0,1.0]	351	1.0 [1.0,1.0]	1.0 [1.0,1.0]
HIV	568	1.4 [0.9,2.3]	1.4 [0.8,2.5]	349	1.1 [0.7,1.9]	1.2 [0.7,2.1]
CHB	216	0.9 [0.5,1.4]	0.7 [0.4,1.3]	553	1.2 [0.7,1.9]	1.3 [0.8,2.0]

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.01$. OR: Odds Ratio. aOR: adjusted Odds Ratio. CI: Confidence Interval.

variables. This quantitative result supports the hypothesis that labeling undocumented migrants "illegal" and treating them as undesirable others and a menace to the state may affect migrant health outcomes (Castañeda et al., 2015; Viruell-Fuentes et al., 2012) beyond the social hardships caused by the lack of a residence permit. Anxiety and depression among undocumented male migrants may also stem from a fear of being arrested by the police resulting in deportation and thus the failure of their migration effort. Overall black men are more subject to police checks than white men (Defender of Rights, 2017) and undocumented black men may be exposed to questioning about legal status by the police.

Women are more vulnerable to migration related to threats and men are more vulnerable to being undocumented because women and men may not be exposed to the same forms of violence and constraints through their migration path. Migration because of threats implies multiple forms of violence for women before, during and after migration, forms of violence with lasting mental health consequences that men may be less exposed to. On the other hand, in the host country, undocumented men may be more exposed to different types of institutional violence than undocumented women are, especially in relation to contact with the police. Generally, women are less subject to police checks than men in the public space because they are generally considered less likely to be delinquents (Jobard, Lévy, Lamberth, & Névanen, 2012). Nevertheless, we observe through the regression analysis that being undocumented for women is not associated to anxiety/depressive symptoms after adjustment, but being employed in unstable and unqualified jobs still is. Then, for women, illegality may lead to difficult undeclared, insecure jobs in housework and care activity (Sargent & Larchanché-Kim 2006) and that may have an impact on their mental health. Further quantitative and qualitative researches should be undergone to investigate the gendered role of interpersonal and institutional violence through the migration path on migrants' mental health.

We also observe that the probability of experiencing anxiety/depressive symptoms was higher during the first 7 years spent in the destination country. We previously demonstrated in the Parcours study that the first 7 years after arrival in the destination country correspond to a period during which the migrant's administrative, economic and residential circumstances remain uncertain (Gosselin et al., 2016). Psychological distress during the first years after migration is a key

issue that requires appropriate forms of support and care. However, in contrast to social issues or other health issues (such as tuberculosis or HIV), this issue appears to have been overlooked. Additionally, in the literature, migrant health variables, such as the length of time in the host country, are often interpreted as proxies for acculturation. However, the meaning of this marker should be reconsidered with respect to specific contexts, particularly in studies on the most recent migrant populations and refugees.

Gender, mental health and transnational ties

Our study also indicates that separation from a child under 18 years old is not significantly associated with anxiety and depression for either women or men. However, another study conducted on sub-Saharan African migrants found that separation from a child is associated with poorer physical health for women (Afulani et al., 2016). Therefore, the link between separation from a child and women's general health may not be due to the stress of the separation but to the fact that women may "deprive" themselves to send money home, which can impair their health. This absence of statistical association between having a child abroad and anxiety/depression is consistent with theories that postulate and empirical studies that demonstrate that only relationships that can offer support play a protective role against depression for both women and men. Relationships of dependency, such as having young children, do not offer protection from depression for either women or men (Cousteaux & Pan Ké Shon, 2008).

For women and men, having both local and transnational support was associated with a lower level of anxiety/depressive symptoms. Therefore, given the long period of insecurity after arrival that migrants face in France (Gosselin et al., 2016), local support may be important for one's emotional well-being because it helps one cope with the settlement process. This result is consistent with those of a qualitative study conducted in Detroit, USA, on Mexican women revealed that while local ties provide support related to settlement in the host country social support from parents and siblings living abroad helped migrants cope with isolation or anti-migrant sentiment and provided them "an alternative space of belonging" (Viruell-Fuentes & Schulz, 2009). The similarities between men and women regarding migration motives and settlement process may explain why we did not observe sex differences regarding the association between a better mental health and the existence of support networks both "here" and "there". Our data only enabled us to study transnational ties in terms of cross-border support. We were unable to investigate the possible relation between mental health and potential stress generated by practices such as providing financial support.

Mental health and chronic diseases among migrants

This study is the first to demonstrate that sub-Saharan migrants infected with HIV or CHB have a probability of reporting anxiety/depressive symptoms that is equal to that of sub-Saharan migrants not infected with HIV/CHB. A previous study has shown that sub-Saharan migrants suffering from HIV had higher rates of depression than the general French population (Feuillet et al., 2016). However, the major difficulties encountered by migrants with HIV may be more associated with difficulties related to their migrant status than with HIV status. In fact, the tightening of immigration policy makes it more difficult for migrants to establish administrative and economic security/stability, which in turn appears to be a post-migration trigger of poor mental health. In France, patients living with HIV may benefit from global care (Pourette, 2013) and support groups (Gerbier-Aublanc, Gosselin, & PARCOURS Study Group, 2016) to help them cope with difficulties. Additionally, migrants living with HIV can access to a one-year renewable resident permit granted to foreigners who suffer from an illness that cannot be effectively treated in the medical system of their country of origin. Although this legislation was recently restricted, it was at the time of the survey granted to such migrants nearly automatically. Thus, the shock of an HIV diagnosis may be tempered by socio-medical support, which helps patients face their other difficulties as migrants. Additionally, given that the participating migrants with HIV had known of their diagnosis for an average of 8 years at the time of the survey (data not shown), most were past the shock stage provoked by their diagnosis. This fact may explain the absence of differences between the HIV-positive group and the reference group.

Limitations and strengths

Our study has several limitations that should be acknowledged. First, the survey was conducted in the greater Paris metropolitan region. Thus, the results may not be generalizable to other regions. However, 60% of the sub-Saharan migrants who reside in France are concentrated in this region that accounts for 18% of the French population (INSEE, 2011). Our sample is representative of migrants who visited healthcare facilities in this region, and it is sufficiently large and diverse to represent as closely as possible the population of sub-Saharan African migrants. Non-probability sampling is more frequent in studies conducted on migrants. However, recruitment in healthcare settings may include less healthy individuals or individuals more inclined to interact with the healthcare system. Because of the retrospective design of our study, migrants who were forcibly or willingly returned to their country of origin were not included. Our analysis of migrant mental health is cross-sectional. It does not consider previous episodes of anxiety and depression, either before or after migration, and it cannot provide evidence of causal association. Finally, no cross-cultural validation of the PHQ-4 among the diverse populations and languages of sub-Saharan Africa has been performed. However, we found a strong association between PHQ-4 scores and socio-demographic risk factors known to be related to anxiety and depression: unemployment, a history of sexual violence and a lack of housing. These associations suggest that the PHQ-4 can be used as a valid general marker of anxiety and depressive symptoms in this population even in the absence of a specifically validated mental-health score.

Conclusion

Leaving one's home country because of threats to one's life and living illegally in a host country are experiences that impair mental health. In the current context of increasing barriers to immigration as well as renewed fears regarding migrants and increased discrimination in European societies against them, migrant mental health is a significant issue. Because it is important to assess the long-term consequences of mental-health problems on the social inclusion and physical health of migrants in Europe, future research should be conducted with validated measurement tools and longitudinal data. There is a need to address migrant mental health using a combination of political, social and public health responses because mental-health determinants appear related to structural factors, such as residential, economic and administrative vulnerabilities, which are high in this population. This study also indicates the importance of organizing mental-health problem prevention for refugees with an understanding of gender-specific interpersonal and institutional violence for the sake of their social inclusion and overall health.

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