Article

The migration journey and mental health: Evidence from Venezuelan forced migration

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Introduction

Migration and mental health

Regardless of whether individuals are among the globe’s 763 million internal migrants or 258 million international migrants (IOM, 2018), being on the move has the potential to negatively influence their mental health, especially if the migration is forced (Hou et al., 2020; Zimmerman, Kiss, & Hossain, 2011). These figures are expected to rise given the likelihood of increased migration due to population pressure, wars, social and political unrest, poverty, and climate change (Grassani, 2018, pp. 1–4; Tacoli, 2009; Vidal, Tjaden, & Global Migration Data Analysis Centre, 2018). Since mental health disorders are already considered the largest contributor to global disease burden (Whiteford et al., 2013), understanding the relationship between migration and mental health is critical for public health prevention efforts.

Migration involves multiple decisions made over time within different individual, social, and political contexts. The migration experience thus depends on its circumstances (e.g., Lindert, Ehrenstein, Priebe, Miëlk, & Brähler, 2009; Zimmerman et al., 2011) and phase (e.g., Alegria, Carson, Goncalves, & Keefe, 2011; Bhugra, 2004; James, Iyer, & Webb, 2019), prompting researchers to conceptualize its influence on mental health in terms of pre-migration, migration, and post-migration factors (e.g., Cantekin & Gençöz, 2017; James et al., 2019, 2019).

Some factors, which relate to an increased likelihood of having common mental health disorders, may be experienced before, during, and after migration. These include poverty, insecurity, homelessness, and risk of violence (e.g., Alegría, Álvarez, & DiMarzio, 2017; Bhugra, 2004; Patel & Kleinman, 2003). Other factors are unique to the pre-migration phase. People fleeing their homes due to forced displacement are more likely to have experienced trauma before migrating compared to those who voluntarily leave in search of improved economic opportunities (Zimmerman et al., 2011). Post-migration factors may include family and neighborhood context, social position, social support and exclusion, language competency, and discrimination and acculturative stress (Alegria et al., 2017).

However, while the potential for significant stress associated with migration is often linked to negative mental health outcomes (Dinesh Bhugra & Jones, 2001), the migration process can also relate to positive mental health results (Virupaksha, Kumar, & Nirmala, 2014). Cultural, community, familial, and individual factors may either increase the likelihood of migration contributing to mental health disorders (Siriwardhana, Ali, Roberts, & Stewart, 2014) or foster resilience in multiple domains (Cardoso & Thompson, 2010).

Based on a review of the literature, Bhugra (2004) developed a contingency model which hypothesizes vulnerability (risk factors) or resiliency (protective factors) for psychological disorders based on the person’s situation and migration stage. Much research has focused on the pre- and post-migration phases (Cantekin & Gençöz, 2017;
Migrating for a specific reason may therefore enhance a person of preparedness (Bhugra 2004; Del Amo et al., 2011). Rates of common mental health disorders among women are higher among women than men (Whiteford et al., 2013), a phenomenon reflected in migrant populations (e.g., Aroian, Norris, González de Chávez, Fernández, & García Averasturi, 2008; Bhugra, 2004; Del Amo et al., 2011). Rates of common mental health disorders are thus likely higher for women migrating from Venezuela to Peru.

Pre-migration vulnerabilities include factors operative in the migrant’s country of origin, including the migrant’s personality, age, skills deficits, and persecution. Given that Venezuelan migration to Peru increasingly constitutes forced displacement (Berganza et al., 2018), we expect an elevated risk for mental disorders for those entering Peru. Overall, few studies have examined the effect of pre-migration age on mental health, despite the propensity of younger people to migrate more than older generations. When age is considered, studies relate it instead to risk factors associated with post-migration acculturation processes (Kimbro, 2009). In regard to sex, rates of common mental health disorders are higher among women than men (Whiteford et al., 2013), a phenomenon reflected in migrant populations (e.g., Aroian, Norris, González de Chávez, Fernández, & García Averasturi, 2008; Bhugra, 2004; Del Amo et al., 2011). Rates of common mental health disorders are thus likely higher for women migrating from Venezuela to Peru.

Pre-migration resiliency is linked to situations in which the decision to migrate was voluntary and migrants could prepare for the endeavor. Migrating for a specific reason may therefore enhance a person’s sense of preparedness (Bhugra & Jones, 2001). The reasons for migrating and choosing a destination country are thus related to how different stressors play out in the pre-migration phase. For instance, those forcibly displaced to ensure survival likely have more elevated stressors than those migrating to access better labor or education opportunities. Furthermore, even under forced circumstances, having an elaborate migration plan and sound reasons for choosing a destination country may be protective against mental health disorders. Given that the present study focuses on the mental health status of people as they entered Peru, not before they left Venezuela, we adapted the model to the context of Venezuelan forced migration and focused on the reasons migrants had for choosing their destination country, including preferences for existing social networks, improved economic standing via access to labor opportunities, access to legal migration status, or higher perceived levels of respect for Venezuelan migrants.

Vulnerability factors operative during the migration phase may be related to experiences of loss (e.g., relationships, assets, support), bereavement, and trauma. We thus examined the migration vulnerability factors of status loss, mode of transportation, and traveling with children. We focus on education and wealth as a proxy for potential status loss since qualitative evidence from Latin American exiles in Sweden suggest that social degradation has a profound impact on mental health (Sandquist, Iglesias, & Isacsson, 1995). Status loss does not represent an objective loss of money or education, but relative differences in the wealth (e.g., inflation and/or currency rates) and education (e.g., degrees not transferring into a new country and/or loss of professional status) associated with migration.

Other researchers have identified mode of transportation as a component of structural vulnerability during migration (Valdez, Valdez, & Sabo, 2015; Vogt, 2013). We thus consider whether migrants are walking during their journey, given its relevance to Venezuelan forced displacement. While some research examines the effect of transportation on health for those residing long term in one place (Macintyre, Ellaway, & Cummins, 2002), to our knowledge studies have yet to investigate the empirical relationship between mode of transport and mental health. Relatedly, the length of the migration journey may be associated with increased stress. While the relationship between the length of journey and mental health remains understudied, prior research has found that the amount of time migrants spend in a city is associated with attachment to the new city (Gilbert & Crankshaw, 1999) and this attachment is a predictor of better overall health (Dufour & Piperata, 2004).

In regard to traveling with children, research on Latino migration to the US has found that migrating with children is stressful for parents and exposes migrant parents to risk of mental health disorders (Ornelas & Perreira, 2011). Likewise, it is well documented that migrating while pregnant is related to common mental health disorders (Fellmeth, Fazel, & Plugge, 2017; Miszurka, Goulet, & Zunzunegui, 2010; Zelkowitz et al.,

![Fig. 1. Modified model of migration and mental health (Bhugra, 2004).](Image)
2004).

As for resiliency during the migration journey, having social support may be protective against common mental health disorders. While Bhugra (2004) has framed marriage as a form of social support, other work suggests marriage may not be protective against mental health in migrant populations beyond other migration-related stressors (James et al., 2019). Given the mixed evidence thus far, more research within a gender-focused framework is needed to better understand the relationship between marriage, health, and gender (Llacer, Zunzunegui, del Amo, Mazzarassa, & Bolímar, 2007). We thus investigate the relationship between pre-migration and migration-related factors to mental health, using the ongoing Venezuelan migration to Peru as a case example.

**Venezuelan forced migration**

In early 2020, Venezuela’s economic, political and humanitarian crisis led to the departure of at least 4.5 million people since 2014 (IOM & UNCHR, 2019) – over 13 percent of the country’s total population. We briefly summarize the historic and socio-economic context of contemporary Venezuelan forced migration. In the 19th century, when many countries in Latin America were ruled by military dictatorships, Venezuela was democratic and wealthy, and its prosperous economy and high living standards made it an attractive destination for migrants from across Europe and Latin America (Ordóñez-Góttii, 1991).

As outlined by Vivas and Paez (2017), in the 21st century, Venezuela shifted from a migrant receiving to a migrant sending country. In 1998, Hugo Chávez won the presidential election promising more equality by applying what he called “Socialism of the 21st Century.” A constitutional reform was enacted in 1999. The first phase of emigration began in 2000. In this phase, migrants were mainly from the upper- and middle-classes, many of whom disagreed with Chávez’s economic policies, including expropriations of private property and the nationalization of industries. Others were concerned about growing insecurity and social and political tensions. The main countries of destination in this first phase of emigration were the United States and Europe, given the migrants’ relative wealth (Vivas & Paez, 2017).

Vivas and Paez (2017) describe a second emigration phase which began in 2012, at the end of the Latin American commodity boom and re-election of Hugo Chávez for a third consecutive term. By then, the Venezuelan economy – which was and remains dependent on oil – entered a serious recession, with migrant profiles shifting to include people from less privileged social backgrounds. Consequently, geographically proximate countries such as Colombia, Panama, and the Dominican Republic became the main countries of destination (Vivas & Paez, 2017).

Finally, Vivas and Paez (2017) identify the third and current emigration phase to have begun around 2015, after the death of Hugo Chávez and the election of Nicolás Maduro as president in 2013. From 2015 to 2019 the Venezuelan economy effectively collapsed and the country fell into a severe humanitarian crisis. Venezuelans experienced a lack of food security, a broken public health system, restricted personal freedom and political persecution, and high levels of crime and insecurity (Vivas & Paez, 2017).

Given the lack of official data, it is difficult to capture this crisis in reliable numbers. According to the Encuesta de Condiciones de Vida (ENCovi), which is perhaps the most accurate measure of indicators such as poverty, food, employment, access to housing, and education, multi-dimensional poverty grew 10% in three years from 2015 to 2018, 90% of Venezuelans did not have enough income to buy food in 2018 and life expectancy fell by 3.5 years (ENCovi, 2018). The ENCovi survey found 698,000 children under five and 222,000 pregnant women (with 52.7% of pregnant women in the country living in poor households) at risk of or qualifying for undernourishment in 2018.

The vast majority of hospitals suffer from an acute shortage of surgical materials, medicines, and radiography and tomography services (OIM, 2019), while the incidence of disease among the Venezuelan population is elevated (Doocy, Page, de la Hoz, Spiegel, & Beyrer, 2019). Intimidation and political persecution threaten personal freedom, with the OIM (2019) reporting arbitrary arrests and the excessive use of violence by law enforcement agencies. Between January 2014 and November 2018, an estimated 12,949 people were arbitrarily detained (OAS, 2019). Armed groups, known as colectivos, also contribute to political intimidation by supporting security forces in the repression of the population.

Beginning in early 2019, political tensions increased when Juan Guaidó, president of the National Assembly, declared himself acting president. The opposition, led by the National Assembly, did not recognize Maduro’s re-election in May 2018 as legitimate. Since then, Guaidó has been recognized as president of Venezuela by over 50 countries, including the US and most countries in Latin America. Despite a base of support for Guaidó, the National Assembly was rendered powerless by the creation of the loyalist National Constituent Assembly in 2017, and the military’s continued support of Nicolás Maduro. By 2020, the political divide between Guaidó and Maduro had resulted in political stalemate and the opposition’s disillusionment with the Guaidó movement.

For many, including both (former) supporters and opponents of Chávez and Maduro, migration now constitutes a survival strategy. In October 2019, the countries that received the most Venezuelan migrants and refugees were Colombia (1.4 million), Peru (860,000), Chile (371,000) and Ecuador (330,000), and Brazil (212,000; IOM, 2019). In this period, migrant profiles further diversified, including many who could not afford plane tickets or bus fares and thus had no other option than to travel on foot to neighboring Colombia, Ecuador and Peru, despite the dangers this entails.

The vulnerability of Venezuelan migrants is multi-dimensional. While most migrants identify economic reasons for leaving (Freier, 2018), the circumstances under which they leave are “not those typically associated with purely economic migrations” (OAS, 2019, p. 6), resembling instead conditions of forced displacement. Based on the Cartagena declaration’s definition of refugee, which 15 countries in the region have incorporated in their legislation, Venezuelan migrants have a legal claim to refugee status (Berganza et al., 2018). Despite the significance of the Venezuelan displacement crisis, which could outpace Syrian displacement in 2020 (Dooley, 2019), few studies to date have examined the mental health effects of Venezuelan forced migration. To our knowledge, the only existing study of the mental health of Venezuelan migrants displaced by the ongoing crisis examined discrimination against migrants during the post-migration phase in the United States and Colombia (Schwartz et al., 2018). This study is the first to focus on pre-migration and migration factors influencing the mental health of Venezuelan migrants.

**Method**

**Power analysis**

Prior to fieldwork, we conducted sample size calculations for comparison of gender differences with the ability to detect 0.2 standardized effects with 80% power and an alpha of 0.05. This resulted in a suggested sample size of 393 males and 393 females. We met these sample requirements with a final sample of 799, or 405 males and 394 females.

**Survey procedures**

All procedures were approved by the review board at Universidad del Pacífico (IRB 19–10) as a part of a larger study investigating the socio-labor integration of Venezuelan migrants in Peru. Data collection took place from April 8–15, 2019 at the Centro Binacional de Atención de Frontera (CEBAF, Binational Border Care Center) in Tumbes, Peru. The CEBAF is located in northern Peru, on the border between Ecuador and Peru. Given the high levels of Venezuelan immigration at the time,
migration control was lengthy, and migrants spent several hours, if not days, at CEBAF. At the time, 1,310 Venezuelans passed through the CEBAF on average per day (OIM, 2019). Migrants were approached to complete the survey throughout the day.

The sampling and survey methods followed those used by the International Organization for Migration (IOM) in their quarterly Displacement Tracking Matrix (DTM, OIM, 2019). Surveys were conducted by trained surveyors who were native speakers or fluent in Spanish. All surveyors completed training sessions prior to data collection to familiarize themselves with the research instrument, participant confidentiality, and responsible conduct of research. To collect a representative sample, surveys occurred in shifts between 8am and 10pm, with one team of three surveyors conducting surveys from 8am to 2pm, and another team of three completing interviews from 2pm to 10pm. Each surveyor completed an average of 16 surveys per day over a continuous period of eight days.

In accordance with IOM protocol, surveyors were instructed to approach people at random, assuring that they maintained a gender balance. Participants were eligible if they were migrating from Venezuela, were over 18 years of age, accepted the invitation to participate, and signed a consent form. When approaching a participant, surveyors introduced the study and explained the aim to “understand their migration decisions, experiences and journey.” If the participant expressed interest, the surveyor read the consent form, reminding the participants that participation was voluntary, confidential, and would not result in any material or financial help. Following signing of the informed consent, the survey began. Participants subsequently received referrals to relevant social services (e.g., mental health tent, Red Cross complex, food and meals tent). Although the research team did not use any mechanism to track refusals to participate, surveyors reported that refusals were rare. When potential participants did refuse to complete the survey, they generally reported a lack of time because they had been called to complete one of the immigration procedures at the border. If someone could not finish the survey at a given time, the surveyor offered to return later. All measures were collected verbally using tablets.

Measures

Participants provided information on pre-migration factors, migration journey factors, and symptoms of anxiety and depression.

First, we assessed factors that influenced participants before migrating (see Fig. 1). These pre-migration factors included the socio-demographic variables of age (continuous) and sex (binary: male, female). Pre-migration factors also included reasons for selecting the destination country (dummy code). Options for selecting the destination country included if the destination country was desirable because it was perceived to return later. All measures were collected verbally using tablets.

Next, we assessed factors conceptualized to influence the migration journey experience (See Fig. 1). Migration factors variables that reflect status loss during migration included education level (categorical, none, primary education, secondary education, technical education, higher education, postgraduate education), and participant subjective wealth (categorical, 1–10), as measured with a modified economic Cantril ladder, known as the economic ladder question (Ravallion & Lokshin, 1999). The economic ladder question is a measure of perceived wealth, as opposed to actual wealth. Venezuela subjective wealth was measured by asking participants to imagine that all the people in Venezuela were placed on a ladder, where those on the first rung were the poorest and those on the tenth, or top rung, were the wealthiest. Participants provided a number between 1 and 10 to represent where they saw themselves on the wealth ladder 5 years ago. Five years were used in order to capture perceived wealth prior to the most acute bouts of socio-economic crisis, as described in the introduction. Community subjective wealth asked the same question of participants, but considering their relative wealth on a ladder representing their local community in Venezuela five years ago. Migration factors also included variables reflecting the migration experience itself such as whether the migrant walked during their journey (dummy code), their original country of choice (dummy code, Chile, Colombia, Peru, with 92% of respondents choosing one of these three), and the number of days spent traveling (log of number of days reported, 3 to 1159, with 77% having spent less than 31 days traveling). Migration factors also included participant childcare-related responsibilities, such as if the participant was pregnant (binary for women only, yes/no), and the number of children traveling with the participant (continuous, 0 to 7). Migration factors also included a variable for marital status (dummy code, single, married, divorced, widowed) to capture this aspect of social support.

Finally, we assessed common mental health disorders including anxiety and depression. Depression was measured with the Spanish version of the 9-item Patient Health Questionnaire (PHQ-9, Calderón et al., 2012; Kroenke, Spitzer, & Williams, 2001). The PHQ-9 has been validated (Calderón et al., 2012; Zhong, Gelaye, Rondon, Sánchez, Simon, Henderson et al., 2015) and used (Barrios et al., 2015; Gomez-Beloz, Williams, Sanchez, & Lam, 2009) widely in Peruvian and Venezuelan populations (Ghisi et al., 2017). Participants responded to nine prompts assessing how often they have been bothered by depressive symptoms over the past 14 days (2 weeks) such as having “little interest or pleasure in doing things” between 0 = not at all to 3 = almost every day. The resulting summary score ranges between 0 and 27. A cut off of 10 was used as a provisional diagnosis for depression, given substantial evidence that this is the ideal cutoff based on sensitivity and specificity (Levis, Benedetti, & Thomsbs, 2019). Internal consistency for the PHQ-9 was good (Cronbach’s alpha = 0.82).

Anxiety was measured with the Spanish version of the 7-item generalized anxiety disorder questionnaire (GAD-7, Garcia-Campayo et al., 2010; Spitzer, Kroenke, Williams, & Löwe, 2006). The GAD-7 has been adapted for Spanish speaking populations (Garcia-Campayo et al., 2010), including being validated in Peruvian populations (Zhong, Gelaye, Zaslavsky, Fann, Rondon, Sánchez et al., 2015) and used with people migrating from Venezuela to Colombia and the United States (Calderón et al., 2012). Participants respond to 7 prompts assessing how bothered they have been by problems related to anxiety over the past 14 days (2 weeks) such as “feeling nervous, anxious, or on edge” from 0 = not at all to 3 = nearly every day. The resulting summary score ranges from 0 to 21. A cut off of 10 was used to capture “moderate” severity of generalized anxiety disorder (Spitzer et al., 2006), with evidence supporting the sensitivity and specificity of this cutoff in Spanish-speaking populations (Garcia-Campayo et al., 2010). Cronbach’s alpha in the present analysis was acceptable (Cronbach’s alpha = 0.78).

Statistical analysis

First, we examined the frequency distribution of demographic characteristics and migration factors. Logistic regressions were used to calculate odds ratios (OR) and 95 percent confidence intervals (95% CI) to assess the associations between exposure factors consistent with pre-migration/migration factors and depression and anxiety. Separate models were run for anxiety and depression, and all analyses included...
all independent variables explicated in the methods section, as well as fixed effects for surveyors, day of the week, and morning vs. afternoon shift. Initially, we ran a pooled model with the entire sample, modelling anxiety and depression separately. All variables were entered into the model simultaneously. Next, we performed the same regressions interacting gender with each independent variable. First, we entered variables associated with pre-migration (Model 1), and then added the migration factors (Model 2). Finally, as a robustness check, we partitioned the database by gender, creating two separate models for each main outcome. The regression models were tested for multicollinearity for which there was no evidence, with a total variance inflation factor below 2. Data analysis was conducted with the use of Stata (StataCorp, 2019). The level of statistical significance was set at p values < 0.05, and all tests were two-tailed.

Results

Table 1 presents the sample’s sociodemographic and mental health characteristics. Sex balancing of the sample was successful with 49% of participants identifying as female. Nineteen percent of the sample qualified for a provisional depression diagnosis with a score on the PHQ-9 of 10 or higher, and 23% of the sample qualified for a provisional generalized anxiety disorder with a score of 10 or higher on the GAD-7.

Further analysis examined predictors of depression and anxiety, beginning with the pooled model (Table 2). For pre-migration factors and depression, citing safety and respect (OR = 1.16; 95% CI: 1.01–1.33) as a reason for choosing the destination country was associated with increased odds for depression. For migration factors and depression, being pregnant (OR = 4.15; 95% CI: 1.05–16.48) was related to increased odds for depression. For pre-migration factors and anxiety, none of the factors were associated with anxiety. For migration factors and anxiety, loss of status as proxied by education (OR = 1.37; 95% CI: 1.11–1.67) and walking at any point in the journey (OR = 1.65; 95% CI: 1.03–2.64) were associated with increased odds of anxiety. Additionally, choosing Peru as a destination country (OR = 0.45; 95% CI: 0.22–0.95) was associated with decreased odds for anxiety.

Next, we examined the model interacted with gender (Table 3), with the pre-migration and migration factors entered separately for depression and anxiety. For women and the pre-migration model and depression (Table 3, Depression Model 1), choosing the destination country for safety and respect (OR = 0.54; 95% CI: 0.41–0.70) was associated with decreased odds for depression. For women and the migration model and depression (Table 3, Depression Model 2), being pregnant was related to increased odds of depression (OR = 4.37; 95% CI: 1.05–18.24). Although the days spent traveling missed standard levels of significance (log, OR = 0.80; 95% CI: 0.63–1.03) the decreased odds of depression are suggestive. Finally, choosing Colombia as the destination country was associated with decreased odds of depression (log, OR = 0.12; 95% CI: 0.02–0.70). For women and pre-migration and anxiety (Table 3, Anxiety Model 1), choosing the destination country for safety and respect (OR = 0.54; 95% CI: 0.41–0.70) was associated with decreased odds for anxiety. For women and migration and anxiety (Table 3, Anxiety Model 2), choosing the destination country for safety reasons were replicated. In addition, the choice of Peru (OR = 0.29; 95% CI: 0.09–0.93) and Chile (OR = 0.23; 95% CI: 0.06–0.82) as destination country were associated with decreased odds of anxiety (See Appendix A, for similar results when women were analyzed in the partitioned database.).

For men when pre-migration and migration factors were entered separately for depression and anxiety (Table 3), we found overall less significance for migration and pre-migration factors. For men and pre-migration and depression (Table 3, Depression Model 1), choosing the

| Table 1 | Sociodemographic and mental health characteristics of the study population. |
|---------|--------------------------------------------------------------------------|
| All Participants (N = 799) | |
| **Pre-migration Factors** | |
| Female | 394 | 49% |
| Age | <M = 30 (SD = 10.3) | Min = 18, Max = 70 |
| Country of Choice | | |
| Peru | 503 | 63% |
| Colombia | 80 | 10% |
| Chile | 152 | 19% |
| Others | 64 | 8% |
| Chose host country for (multiple choice): | | |
| Social reasons | 564 | 71% |
| Work reasons | 477 | 60% |
| Respect reasons | 15 | 2% |
| Legal reasons | 19 | 2% |
| **Migration Factors** | | |
| Education | Secondary | 319 | 40% |
| Wealth Venezuela ≤5 | 329 | 41% |
| Wealth Community ≤5 | 365 | 46% |
| Marital Status | | |
| Single | 436 | 55% |
| Married | 337 | 42% |
| Divorced | 20 | 2% |
| Widowed | 6 | 1% |
| Traveling with children | | |
| 1 Child | 130 | 16% |
| 2 Children | 69 | 9% |
| 3+ Children | 33 | 4% |
| Pregnant (n = 394 women) | 27 | 7% |
| Walked at any point | 251 | 31% |
| Days travelled | M = 65 SD = 162.4 |
| **Mental Health Outcomes** | | |
| Depression (PHQ9≥10) | 149 | 19% |
| Anxiety (GAD≥10) | 181 | 23% |

| Table 2 | Logit regression modelling relation between pre-migration and migration factors and depression (PHQ9≥10, N = 799) and anxiety (GAD7≥10, N = 799). |
|---------|------------------------------------------------------------------|
| **Depression** | |
| Female | 1.62* | 0.96–2.72 | 1.37 | 0.90–2.10 |
| Age | 1.01 | 0.98–1.03 | 1.00 | 0.98–1.02 |
| Reasons for Migrating: | | |
| Legal access and welfare services | 1.11 | 0.95–1.31 | 1.04 | 0.91–1.19 |
| Family reunification | 1.24* | 0.97–1.60 | 1.09 | 0.91–1.32 |
| Safety and respect | 1.16** | 1.01–1.33 | 0.91 | 0.71–1.17 |
| Region of host country | 1.23 | 0.95–1.59 | 0.96 | 0.80–1.16 |
| **Anxiety** | |
| Female | 2.72 | 1.37–5.42 | 1.47 | 0.91–2.41 |
| Age | 2.19 | 1.59–2.98 | 1.87 | 1.30–2.69 |
| Reasons for Migrating: | | |
| Legal access and welfare services | 1.33 | 1.06–1.68 | 1.07 | 0.83–1.39 |
| Family reunification | 1.24* | 0.97–1.60 | 1.09 | 0.91–1.32 |
| Safety and respect | 1.16** | 1.01–1.33 | 0.91 | 0.71–1.17 |
| Region of host country | 1.23 | 0.95–1.59 | 0.96 | 0.80–1.16 |
| Education | 0.98 | 0.76–1.27 | 1.37*** | 1.11–1.67 |
| Wealth Venezuela | 1.17 | 0.91–1.50 | 0.92 | 0.75–1.13 |
| Wealth Community | 0.83 | 0.64–1.07 | 1.01 | 0.83–1.22 |
| Married | 1.25 | 0.73–2.16 | 1.35 | 0.85–2.14 |
| Divorced | 0.98 | 0.31–3.06 | 0.66 | 0.18–2.47 |
| Widowed | 1.70 | 0.40–7.26 | 1.15 | 0.23–5.80 |
| Traveling with children | 1.00 | 0.72–1.39 | 1.16 | 0.92–1.47 |
| Walked at any point | 1.50 | 0.85–2.67 | 1.65** | 1.03–2.64 |
| Log Days travelled | 0.88 | 0.73–1.06 | 1.02 | 0.88–1.19 |
| Destination Country: | | |
| Peru | 0.69 | 0.25–1.87 | 0.45** | 0.22–0.95 |
| Colombia | 0.32* | 0.09–1.11 | 0.98 | 0.39–2.42 |
| Chile | 0.71 | 0.23–2.19 | 0.53 | 0.23–1.19 |
| Constant | 0.10* | 0.01–1.21 | 0.05*** | 0.01–0.25 |

Cl = Robust confidence intervals in OR= Odds ratios. ***p < 0.01, **p < 0.05 and *p < 0.1.

a Ref = Not pregnant.
b Ref = Single.
c Ref = Single.
d Ref = Single.
e Ref = No walking during the journey.
f Ref = All other countries.
Logit regression modelling interaction between gender and pre-migration factors and depression (PHQ9≥10, N = 799) and anxiety (GAD7≥10, N = 799), Model 1 includes premigration factors only and, Model 2 included premigration and migration factors.

| Reference categories | Depression | Anxiety |
|---------------------|------------|---------|
|                     | Model 1    | Model 2 |
|                     | OR CI      | OR CI   | OR CI      | OR CI     |
| Female              | 2.46 0.54-11.29 | 16.49 0.36-763.76 | 6.67*** 2.04-21.85 | 15.84* 0.71-355.00 |

**Premigration Factors**

- Male # Age: 1.02 0.98-1.06, 1.01 0.97-1.05
- Male # Legal access and welfare services: 1.15* 0.98-1.36, 1.16 0.97-1.40
- Male # Family reunification: 1.32 0.95-1.83, 1.34* 0.95-1.89
- Male # Safety and respect: 1.71*** 1.22-2.41, 1.79*** 1.31-2.46
- Male # Region of host country: 0.97 0.64-1.48, 1.07 0.64-1.76
- Female # Age: 1.00 0.97-1.03, 1.01 0.98-1.04
- Female # Legal access and welfare services: 1.06 0.69-1.63, 1.00 0.61-1.66
- Female # Family reunification: 1.19 0.87-1.63, 1.16 0.82-1.66
- Female # Safety and respect: 0.60*** 0.40-0.90, 0.66** 0.44-0.97
- Female # Region of host country: 1.12 0.87-1.45, 1.31* 0.97-1.78
- Female # Married: 1.64 0.29-9.14
- Female # Widowed: 1.99 0.65-1.84
- Female # Married: 1.12 0.52-2.58
- Female # Divorced: 1.64 0.29-9.14
- Female # Traveling with Children: 1.19 0.53-2.67
- Female # Log Days Travelled: 0.95 0.70-1.30
- Female # Peru: 2.29 0.65-8.06
- Female # Chile: 1.72 0.36-8.37
- Female # Region of host country: 0.05*** 0.01-0.22, 0.02*** 0.00-0.37

**Model 2**

Logit regression modelling interaction between gender (male) and migration factors and depression (PHQ9≥10, N = 799) and anxiety (GAD7≥10, N = 799), Model 1 includes premigration factors only and, Model 2 included premigration and migration factors.

| Migration Factors | Depression | Anxiety |
|-------------------|------------|---------|
|                    | Model 1    | Model 2 |
|                    | OR CI      | OR CI   | OR CI      | OR CI     |
| Female             | 2.46 0.54-11.29 | 16.49 0.36-763.76 | 6.67*** 2.04-21.85 | 15.84* 0.71-355.00 |

**Migration Factors**

- Male # Education: 1.08 0.71-1.63
- Male # Wealth Venezuela: 1.18 0.84-1.67
- Male # Wealth Community: 0.81 0.57-1.16
- Male # Married: 1.16 0.52-2.58
- Male # Divorced: 1.64 0.29-9.14
- Male # Traveling with Children: 1.19 0.53-2.67
- Male # Log Days Travelled: 0.95 0.70-1.30
- Male # Peru: 2.29 0.65-8.06
- Male # Chile: 1.72 0.36-8.37
- Male # Region of host country: 0.05*** 0.01-0.22

**Model 2**

Logit regression modelling interaction between gender (female) and migration factors and depression (PHQ9≥10, N = 799) and anxiety (GAD7≥10, N = 799), Model 1 includes premigration factors only and, Model 2 included premigration and migration factors.

| Migration Factors | Depression | Anxiety |
|-------------------|------------|---------|
|                    | Model 1    | Model 2 |
|                    | OR CI      | OR CI   | OR CI      | OR CI     |
| Female             | 0.94 0.66-1.35 | 1.25 0.93-1.68 |
| Female             | 1.18 0.84-1.67 | 1.02 0.67-1.12 |
| Female             | 0.83 0.60-1.14 | 1.13 0.87-1.47 |
| Female             | 4.37** 1.05-18.24 | 1.25 0.36-4.38 |
| Female             | 1.39 0.60-3.21 | 1.53 0.78-2.99 |
| Female             | 0.77 0.14-4.37 | 0.72 0.11-4.68 |
| Female             | 2.47 0.40-15.10 | 1.99 0.36-11.01 |
| Female             | 0.82 0.53-1.26 | 1.06 0.76-1.48 |
| Female             | 2.05 0.86-4.89 | 1.70 0.83-3.52 |
| Female             | 0.80 0.63-1.03 | 1.11 0.89-1.38 |
| Female             | 0.27 0.05-1.38 | 0.29** 0.09-0.93 |
| Female             | 0.12** 0.02-0.70 | 0.87 0.21-3.66 |
| Female             | 0.34 0.06-1.87 | 0.23** 0.06-0.82 |

CI = Robust confidence interval, OR = Odds ratio. ***p < 0.01, **p < 0.05 and * p < 0.1. Fixed effects for surveyor and shift.

Reference categories are specific to gender groups (e.g., all male categories are referent to male categories).

1,2,3,9,10 ref: Single. There are no widowed male so the variable is blank.
4 & 12 ref: No walking during the journey.
5 & 13 ref: Not Peru.
6 & 14 ref: Not Colombia.
7 & 15 ref: Not Chile.
8 ref: Not Pregnant.
Discussion

This study investigates the prevalence of depression and anxiety in Venezuelan migrants crossing the border between Ecuador and Peru and the contribution of relevant migration factors to their incidence. Our analysis, guided by a modified version of Bhugra’s (2004) migration and mental health model, found elevated levels of depression and anxiety in Venezuelans migrating into Peru. On one hand, the prevalence of depression was 19% for anxiety and 25% for depression, which are higher than rates found in global population prevalence studies, where longitudinal analyses find depression point prevalence rates at about 4.4% and anxiety point prevalence rates ranging from 3.8 to 4% (Baxter et al., 2014). On the other hand, the prevalence found is lower compared to other migration – and especially forced displacement populations – such as rates of depression in Syrian refugee populations estimated at about 45% (Cantekin & Gençöz, 2017; Poole, Hedd-Gauthier, Liao, Raymond, & Birnighausen, 2018). However, most studies investigate mental health status of migrants during the post-migration phase or within refugee resettlement camps. Indeed, models of migration would posit that mental health effects may continue to rise in the post-migration phase if settlement conditions are less than ideal (Bhugra, 2004). Our study thus provides a preliminary look at the migration related mental health effects of a population in the migration journey phase.

In general, pre-migration was not a substantial contributor to mental health. The only variable associated with increased risk for anxiety and depression was choosing the destination country for safety and respect. For women, choosing the destination country for safety and respect was associated with increased odds of depression and anxiety, while for men, it was associated with increased odds of depression and anxiety. Prior research has found that forced migration is particularly harmful for mental health as migrants are unable to sufficiently prepare for the migration journey (James et al., 2019). Thus, while many migrants likely imagine that their safety will increase upon leaving Venezuela, the reality is that the journey is also dangerous (UNHCR, 2019) and destination countries, such as Peru, are showing increasing levels of xenophobia (Associated Press, 2019; Freier & Parent, 2019; Sequera, 2019). It may be that men in particular continue to experience the perceived burden of providing protection against insecurity and xenophobia, while women feel relief from having escaped insecurity in Venezuela. However, the present study cannot speak to the reasons behind this finding, and future qualitative research is warranted.

Several significant relationships appeared linking migration journey factors with depression and anxiety. Pregnancy contributed to depression for women; walking at any point in the journey was related to anxiety for both men and women; length of travel and choosing Colombia as a destination country were protective against depression in women; choosing Peru and Chile were protective against anxiety in women; and education contributed to anxiety for men.

The most robust relationship between migration and mental health was between pregnancy and depression. Thus, pregnancy may be the most significant factor that women deal with while migrating, though one must consider that being pregnant may also have entered into the decision to migrate in the first place. Other research has found rates of depression are high among pregnant women in Peru (Gelaye, Rondon, Araya, & Williams, 2016). That migrant women in the present study were nearly four times more likely to qualify for a depression diagnosis than non-pregnant women is concerning, and, unfortunately, in line with other research on pregnant migrant women (Miszurk et al., 2010; Zelkowitz et al., 2004). In addition, the number of children Venezuelans were migrating with was not related to depression or anxiety. While migrating with children has been found to be stressful for parents (Ornelas & Perreira, 2011), the stress may not be great enough to outweigh the benefits of being with your children. Additionally, research on the effect of parental migration on children suggests that migrant children seem to mostly be protected from the effects of risk factors on mental health (Stevens & Vollebergh, 2008). Thus, in terms of familial variables related to migration, pregnancy is more robustly related to mental disorders, and pregnant migrants should be screened for depression. However, it is important to note that prior research on pregnancy and migration (e.g., Miszurk et al., 2010) has not conceptualized pregnancy in terms of pre-migration and migration related phases, and it is difficult to say whether the relation between depression and pregnancy is due to the pre-migration variables associated with the pregnancy (e.g., motivations for leaving the country with pregnancy) or the stressors associated with the migration journey (e.g., physical and hormonal changes in pregnancy). Future conceptual models of migration should further explore how pregnancy may affect individual women in the migration journey context.

Next, whether migrants walked at any point during the migration journey was related to generalized anxiety. A bus ticket from Venezuela to Peru can cost between 180 USD to 300 USD per person. While some can pay for a bus by using their savings or selling belongings before traveling (Blouin & Freier, 2019; JRS, 2019), not all can afford traveling parts of, much less the entire, trip by bus. This has led hundreds of thousands of individuals to leave the country on foot (Casey & González, 2019), which results in increased vulnerability and a higher likelihood of exposure to stressful and traumatic experiences.

When examining mode of traveling, our results suggest that days spent traveling was protective against depression in women though it nearly missed standard levels of significance. This contrasts with existing, but limited, literature that suggests the more time migrants spend in a city, the more attachment they have to that new city (Gilbert & Cankkash, 1999) and the better their overall health (Dufour & Piperata, 2004). It may be that in this particular context, the ability to take one’s time during the journey, often involving more extended time in Colombia or Ecuador, is associated with better integration, better migration conditions, or other factors related to depression. Indeed, more granular information is needed on this novel finding, and future research should explore this relationship, ideally in qualitative exploration. Similarly, the relationship between destination country of choice and mental health was protective for women. The choice of Colombia was protective against depression, while choosing Peru or Chile was protective against anxiety. In this case, given that people are arriving in Peru at the time of the survey, the arrival in your country of choice (Peru) or the most proximate country (Chile) may provide relief that overrides feelings of anxiety. Ultimately, these findings provide further support that the variables associated with the migration journey, such as how you travel, how long you travel, and where you intend to travel, are particularly important for mental health outcomes in forcibly displaced populations.

In regard to status loss, and in line with our conceptual model, we found that education was related to anxiety for men. Given the considerable percentage of students dropping out of schools in Venezuela (Alharran Peña, 2019), the process of status loss occurs before and during migration, affecting a large number of migrants, and may be a particularly salient contributor to mental health in the current context (McIlwaine, 2008; Roizblatt & Pilowsky, 1996). However, status loss as measured by relative wealth did not significantly relate to mental health. This lack of a relationship between (subjective) wealth and...
mental health may be related to the ubiquity of wealth loss in Venezuela.

We did not find a significant relationship between marital status and mental health. While marital status has been a protective factor in some prior studies, other variables have been more important than marriage for mental health. For example, the psychological distress associated with the inability to work while asylum claims are being assessed or inadequate state support were found to negatively influence mental health over and above social support (James et al., 2019). Unfortunately, we did not assess if couples were traveling together, making it difficult to assert if marital status represents social support or fails to counteract other forms of distress during migration.

This study is not without limitations. Due to the cross-sectional research design, we cannot claim any of the variables studied here are counteracted other forms of distress during migration. Appendix C. Supplementary data

Especially of restrictive policy changes should investigate the effects of changing immigration policies to the country (Acosta, Blouin, & Freier, 2019; Bolivar, Freier, & Luzes, 2019; Freier & Castillo, 2019; Freier & Luzes, 2020). Future research should investigate the effects of changing immigration policies – especially of restrictive policy changes on mental health.

As explicated above, the conceptual model utilized in the present study is not without limitations. We were missing variables such as mental health status pre-migration and family mental health history, while several variables we did include lacked additional nuance that would be informative in future research. For instance, our pregnancy variable was binary and did not include gestational stage, which may influence the likelihood of depression due to hormonal (Maccari, Darnaudery, Morley-Fletcher, Zuena, & Reeth, 2003) and environmental factors (Heijmans, Tobi, Lumey, & Slagboom, 2009). A more nuanced understanding of the relative timing of significant events (i.e., pre-migration or migration), such as discovering one is pregnant before migrating or during the migration journey, will strengthen future investigations with the present conceptual model and likely reduce the variability (i.e., high confidence intervals) in the results. However, as this is the first study of its kind, and such data is difficult to collect from individuals who have been forcibly displaced from their country of origin, we find the study results to be an important addition to the existing literature.

In sum, although we found few pre-migration related factors associated with the incidence of mental health disorders, we did find various migration journey factors related to mental health. Accordingly, within the context of forced displacement, the most complex relationships between mental health and migration seem to center around the experience of the migration journey itself. This suggests that pathways to mental health in displaced populations may be bolstered by screening and support for individuals who have had particularly difficult migration journeys (i.e., walking, pregnant). Indeed, more work is needed to model the journey, understand the influence of forced displacement on mental health, and explore the implications of how people migrate on their long-term health. Future work would benefit from more nuance in the measurement of migration-related variables, such as through qualitative supplemental interviews. Regardless, the fact that we find associations between pre- and migration-related factors and mental health is important and concerning, as the experience of migration and associated psychological distress may influence post-migration mental health (Bhugra, 2004). For this sample, the effects of pre- and migration-related factors on mental health will likely increase in the post-migration phase at least over the short term as migrants seek initial integration.

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Appendix C. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ssmph.2020.100551.

Appendix A. Women Only: Logit regression modelling relation between pre-migration and migration factors and depression (PHQ9≥10, N = 394) and anxiety (GAD7≥10, N = 394), Model 1 includes premigration factors only and, Model 2 included premigration and migration factors

|                        | Depression | Anxiety |
|------------------------|------------|---------|
|                        | Model 1    | Model 2 | Model 1   | Model 2   |
|                        | OR   | CI   | OR   | CI   | OR   | CI   | OR   | CI   |
| **Premigration Factors** |   |     |   | |   |     |   |     |
| Age                    | 1.00| 0.97–1.03| 1.01| 0.98–1.04| 0.98**| 0.95–1.00| 0.98| 0.96–1.01|
| Reasons for Migrating: |   |     |   | |   |     |   |     |
| Legal access and welfare services | 1.10| 0.72–1.66| 1.02| 0.62–1.69| 1.04| 0.77–1.42| 1.00| 0.77–1.30|
| Family reunification   | 1.17| 0.86–1.59| 1.14| 0.81–1.60| 0.91| 0.72–1.14| 0.89| 0.70–1.14|
| Safety and respect     | 0.60**| 0.40–0.90| 0.69*| 0.46–1.03| 0.55***| 0.42–0.72| 0.50***| 0.37–0.68|
| Region of host country | 1.12*| 0.84–1.48| 1.33*| 0.96–1.83| 0.98| 0.78–1.23| 0.81| 0.61–1.09|

(continued on next page)
### Appendix B. Men Only: Logit regression modelling relation between pre-migration and migration factors and depression (PHQ9≥10, N = 405) and anxiety (GAD7≥10, N = 405), Model 1 includes premigration factors only and, Model 2 included premigration and migration factors

| Depression | Anxiety |
|------------|---------|
| **Model 1** | **Model 2** | **Model 1** | **Model 2** |
| **OR** | **CI** | **OR** | **CI** | **OR** | **CI** | **OR** | **CI** |
| **Education** | 0.96 | 0.66–1.38 | 1.24 | 0.93–1.67 |
| **Wealth Venezuela** | 1.24 | 0.88–1.75 | 0.84 | 0.64–1.09 |
| **Wealth Community** | 0.79 | 0.56–1.12 | 1.17 | 0.91–1.52 |
| **Premarriage** | 3.63* | 0.92–14.39 | 1.33 | 0.39–4.55 |
| **Married** | 1.24 | 0.55–2.81 | 1.49 | 0.75–2.95 |
| **Divorced** | 0.66 | 0.11–3.94 | 0.67 | 0.12–3.70 |
| **Widowed** | 2.07 | 0.33–12.74 | 1.59 | 0.27–9.37 |
| **Traveling with children** | 0.85 | 0.56–1.27 | 1.03 | 0.73–1.45 |
| **Walked at any point** | 1.96 | 0.84–4.56 | 1.78 | 0.88–3.56 |
| **Log Days Travelled** | 0.79* | 0.60–1.04 | 1.12 | 0.90–1.43 |
| **Destination Country** | 0.27* | 0.06–1.26 | 0.30** | 0.10–0.91 |
| **Peru** | 0.12** | 0.02–0.61 | 1.10 | 0.28–4.37 |
| **Colombia** | 0.12** | 0.02–0.61 | 1.10 | 0.28–4.37 |
| **Chile** | 0.33 | 0.06–1.74 | 0.25** | 0.07–0.84 |
| **Constant** | 0.19** | 0.04–0.92 | 0.56 | 0.01–22.61 | 0.32* | 0.09–1.10 | 0.19 | 0.02–1.71 |

*CI = Robust confidence interval, OR = Odds ratio. ***p < 0.01, **p < 0.05 and * p < 0.1.
1 ref: Not pregnant.
2 & 4 ref: Single.
3 ref: No walking during the journey.
5 ref: All other countries.

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