Mental health and discrimination among migrants from Africa: An Italian cross-sectional study

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Abstract
This study aimed to assess depression, anxiety, posttraumatic stress disorder (PTSD) and discrimination in African migrants and investigate determinants. A cross-sectional study was conducted in Italy (July 2019–February 2020). Inclusion criteria: being a citizen of an African country or having parents who are citizens of an African country. Questionnaires included tests for depression, anxiety, PTSD, discrimination. Multivariable regressions were performed. Participants were 293. The prevalence of depression, anxiety, and PTSD was: 12.1%, 12.1%, and 24.4%. Only 7.2% declared not to be discriminated. Among significantly associated factors, waiting for/being in possession of temporary permits and discrimination were associated with all mental outcomes. Being (or having parents from) Sub-Saharan Africa increased the likelihood of discrimination. A relevant prevalence of mental illnesses was reported. Particularly, Sub-Saharan Africans potentially offer a unique point of view. Migrants' mental health should be a priority for national and international programs of health monitoring.
INTRODUCTION

In the last years, thousands of people migrated to southern Europe. Italy is one of the European countries most involved. To date, 8.7% of total Italian population is composed of migrants who are steadily living in Italy, with increasing rates of migrants from Africa (Caritas e Migrantes, 2018), foremost Nigerians (OECD, 2019). In particular, amongst male migrants, newcomers in Italy are mostly Africans. Moreover, Moroccans are the biggest community holding a staying permit (Caritas e Migrantes, 2020).

Although several studies outlined migrants are exposed to risk factors associated with their country of origin and with the process of migration, some works investigated risk factors associated with acculturation stress and struggle to integrate in the new country (Giacco et al., 2018). The integration process in a new country can be a source of stress and it can be associated with poor mental health (Lindert et al., 2008). Migrants experience a variety of psychiatric symptoms during migration, such as depression, anxiety, or posttraumatic stress disease (PTSD) (Lindert et al., 2008). These issues may last for years (Heeren et al., 2014). Many social determinants can play a role in migrants' mental health status (Hynie, 2018). For instance, legal status has been associated with migrants' wellbeing (Heeren et al., 2014). However, relationships between migrant conditions and mental health are still discussed as national and local policies can play a crucial role in promoting integration and in mitigating acculturative stress.

Among the main determinants of poor mental health, it has been suggested that the extent to which migrants feel welcomed or discriminated can have an important role (Hynie, 2018). In Italy, an analysis from the Italian National Institute for Statistics stated that 15.8% of migrants reported discrimination at work and, in addition, discrimination was linked to poorer mental health (Di Napoli et al., 2017); however, no data was available outside the workplace. Although evidence on the association between migrants' perceived discrimination and poor mental health is emerging in many high-income countries (Brydsten et al., 2019; Qin et al., 2020; Ra et al., 2019; Straiton et al., 2019), in Italy there has not been a significant chance in policies recently and the approach to integration is oriented to the handling of emergencies and short-term residency (Solano & Huddleston, 2020).

Moreover, several other variables have been associated with poor mental health in migrant populations, such as years of resettlement (Bustamante et al., 2017; Giacco et al., 2018), worries for the family left in another country and poor social support (Forte et al., 2018; Giacco et al., 2018), economic situation, working and living condition (Hynie, 2018; Jurado et al., 2017). In addition, migrants may have more difficulties in seeking help for both mental and physical issues as they might access to health services improperly (Norredam et al., 2010) and the lack of information on health care system can be associated with poor mental outcomes (Forte et al., 2018).

Since few studies in the Italian context exist (Cristofalo et al., 2018), this study aimed to assess prevalence of depression, anxiety, and PTSD in African migrants in Italy and to investigate the above-mentioned determinants in this specific subpopulation of migrants. In addition, the present paper aimed to explore level and determinants of perceived discrimination, which is one of the main factors associated with poor mental health in this population (Hynie, 2018).

METHODS

A cross-sectional study was performed amongst a convenience sample of adults living in Piedmont (North-West of Italy) between July 2019 and February 2020. Inclusion criteria were being a citizen of an African country or being an Italian citizen whose parents were citizen of an African country. The Ethics Committee of BLINDED approved
the protocol (BLINDED). Participation was voluntary and anonymous, and participants received no compensation. Written informed consents were obtained. Consents and questionnaires were provided in Italian, English, French, Spanish, and Arabic. The researchers and a cultural mediator, when appropriate, were available to clarify issues.

2.1 | Procedure

The paper questionnaires' distribution was performed by the researchers in public meeting spaces (e.g., university libraries and reading rooms) and in centers that provide integrated reception interventions (Sistema di protezione per titolari di protezione internazionale e per minori stranieri non accompagnati, SIPROIMI). Moreover, associations of foreign citizens in Piedmont were contacted by email. Two associations participated and helped the researchers to reach the participants (also in this case paper questionnaires were used). The study was interrupted in February 2020 because of the intercurrent SARS-CoV-2 pandemic, thus limiting the sample size.

2.2 | Measures

Questionnaires were self-administered and composed of two sections (32 items).

The first section investigated socio-demographic characteristics: age, gender, nationality (if Italian nationality: parents’ nationality was asked), country of birth, educational level, time spent in Italy (or participants not born in Italy), type of permit, working and study situation, economic, and living condition, and perception of health status. Respondents were asked if their family was living or not in Italy with them, and if they had someone (outside of their family) they can trust in Italy. Information about healthcare access was collected by asking where participants seek help when they have health problems. Most variables entered in this section were selected by the researchers based on their associations with poor mental health outcomes in migrant populations as explained in the Introduction section (Bustamante et al., 2017; Forte et al., 2018; Giacco et al., 2018; Heeren et al., 2014; Hynie, 2018; Jurado et al., 2017; Norredam et al., 2010).

Independent variables were coded from the above-mentioned items. To simplify because of the small sample size, certain questions were recoded as follows. Participants’ nationality (if not Italian) and parents’ nationality were clustered based on United Nations geographical regions: Northern Africa and Sub-Saharan Africa. Educational level was grouped in “lower than high school diploma,” “high school diploma,” and “higher than high school diploma.” For perceived economic and health situations, “insufficient” was combined with “poor,” and “good” was combined with “excellent.” For participants without Italian nationality, the type of permit was dichotomized in “waiting for/in possession of temporary permits” (e.g., asylum seeker, refugee/subsidiary protection/political asylum, resident with temporary/short-term residence permit) and “with a permanent permit” (permanent/long-term residents). The healthcare access was dichotomized: “seeking help from the National Health Service (NHS)” (hospital/emergency room, general practitioners/doctors on call) and “not seeking help from the NHS” (reception facility staff/volunteers/associations, compatriots).

The second section consisted of validated tests. Depressive symptoms were investigated through the Patient Health Questionnaire-2 (PHQ-2), a 2-item instrument for depression screening (Kroenke et al., 2003). Anxiety was measured by the Generalized Anxiety Disorder-2 (GAD-2), a 2-item questionnaire for anxiety disorder screening (Kroenke et al., 2007). A score of 3 or above (range: 0 to 6) represented a higher probability of major depression (PHQ-2) and anxiety disorders (GAD-2) (Kroenke et al., 2003, 2007) To assess PTSD, the Primary Care PTSD Screen for DSM-5 (PC-PTSD-5) was used. If participants denied traumatic events, they did not complete the PC-PTSD-5. If participants affirmed to have experienced traumatic events, they completed the PC-PTSD-5: the test was above the cut-off for PTSD if participants answered “Yes” at least to three items out of five (Prins et al., 2016). Concerning discrimination, the Everyday Discrimination Scale (EDS) (Williams et al., 1997) was modified to simplify
understanding and compilation of the survey. Specifically, a four options scale was proposed instead of a six option one. The four options that were used were: "Never/rarely" (0 points), "A few times a month" (1 point), "At least once a week" (2 points) and "Almost every day" (3 points). The final score ranged from 0 to 15. Therefore, the EDS that we used was not comparable with studies that used the original score. Nevertheless, the higher the score the greater the perceived discrimination is. The EDS was complemented by the recommended follow up questions to investigate the perceived reasons for discrimination experiences (possibility to indicate more options) (Williams et al., 1997). Since there are no EDS cut-offs to assess the presence or absence of discrimination, in the follow up questions we added the option "I do not think I have ever been discriminated" to have an estimate of the percentage of participants who did/did not perceive any discrimination (variable called "reported discrimination"). The above-mentioned tools were chosen for their shortness and ease of use. It must be noted that they can be used for symptom screening and they cannot be used to diagnose. Moreover, these instruments have already been used in studies on migrant populations (Beutel et al., 2016; Tibubos et al., 2018; Weine et al., 2012). The PC-PTSD-5 and EDS were translated by the authors and native collaborators with the help of cultural mediators, while the PHQ and GAD are freely available in many languages (Patient Health Questionnaire Screeners website, n.d.). In our sample, the used tools had an acceptable Cronbach's alpha (PHQ-2: 0.750; GAD-2: 0.674; PC-PTSD-5: 0.714; EDS: 0.911).

The present paper had four outcomes: depressive symptoms, anxiety symptoms, PTSD, and perceived discrimination. According to the above-mentioned criteria, the presence/absence of a high probability of depression, anxiety disorders, and PTSD were considered as binary outcomes. The EDS was analyzed as a continuous outcome.

2.3 | Statistical analysis

Descriptive analyses were performed. Continuous variables were expressed as the median and interquartile range (IQR) since the Shapiro Wilk test indicated non-normal distributions (e.g., age and EDS score). Differences in socio-demographic variables were examined by χ² and Mann Whitney U tests. To evaluate differences between the groups defined by each outcome, χ² tests and Mann Whitney U tests (when appropriate: Kruskal Wallis test) were computed. Three PC-PTSD-5 categories were considered in such analyses (no traumatic event; traumatic event but below the cut-off for PTSD; traumatic event and above the cut-off for PTSD), while two categories were used in regression models (above the cut-off for PTSD; below the cut-off for PTSD, including participants without traumatic event) (Prins et al., 2016).

For binary outcomes, multivariable logistic regressions were conducted to explore the influence of independent variables (results expressed as adjusted odds ratio [adjOR], 95% CI). Multivariable linear regression models were executed for the discrimination outcome (results expressed as adjusted unstandardized coefficient [adjB], 95% CI). For each outcome, three models were performed: one with all participants, one with participants without Italian nationality and one with participants with Italian nationality. All models were adjusted for age and gender. Final models were achieved with a backward stepwise method. EDS score was included in the first step of all mental health outcomes' models. The differences in the variables entered in the first step were: living in a reception facility (a kind of building dedicated to housing of migrants waiting for a residency permit) and personal nationality were entered in models with participants without Italian nationality, while parents' nationality was entered in models with participants without Italian nationality.

Data analysis was performed using SPSS (v25) and a double-tailed p value<.05 was considered statistically significant. Missing values were excluded. The variables with the highest percentage of missing data were "perceived health status" (4.4%) and "seeking help from the NHS" (3.4%). The outcomes had a low percentage of missing data: PHQ-2 1%, GAD-2 1%, EDS 1.4% and PC-PTSD-5 0.7%. All other variables had a percentage of missing data below 1.7%.
3 | RESULTS

3.1 | Characteristics of the sample

A total of 293 questionnaires were collected. Females accounted for 28.3% and median age was 31 (IQR = 27–40). Participants with Italian nationality were 146 (49.8%), and among them 38 (26.4%) had parents from Northern Africa and 106 (73.6%) from Sub-Saharan Africa (represented for 70.8% by Western Africa). Among respondents without Italian nationality (50.2%), 34 (23.1%) came from Northern Africa and 113 (76.9%) from Sub-Saharan Africa (represented for 77.9% by Western Africa). Most of the sample was not born in Italy (n = 243, 83.2%). Among participants with Italian nationality, 31.5% was born in Italy. Among participants without Italian nationality, 44 (29.9%) lived in a reception facility and 92 (62.6%) had a temporary permit or were waiting for it.

The majority (82.4%) had an insufficient/poor perceived economic situation and 15% had an insufficient/poor perceived health status. Over 90% declared to seek help from NHS in case of need. Respondents with and without Italian nationality presented different frequencies of most of the socio-demographic variables (Table 1).

3.2 | The outcomes

The PHQ-2 resulted above the cut-off for depressive symptoms in 12.1% with a median score of 2 (IQR = 0–2), the GAD-2 was above the cut-off for anxiety disorder symptoms in 12.1% with a median score of 1 (IQR = 1–2). A total of 62.2% had no traumatic event, while 24.4% was above the cut-off for PTSD according to the PC-PTSD-5 (i.e., 64.5% of participants who had a traumatic event). The median EDS score was 5 (IQR = 3–7). The outcomes were differently distributed stratifying by nationality: there was a higher prevalence of mental health outcomes above the cut-off for symptoms among respondents without Italian nationality and higher EDS median among people with Italian nationality (Table 1).

Considering the EDS follow up questions, only 7.2% declared not to be discriminated. The most frequently reported reason for perceived discrimination was color of the skin (80.2%), followed by national origin (73.4%), ethnicity (56.7%), and religion (39.9%) (possibility to indicate more options).

Significant associations were found between mental health outcomes, showing possible connections between the considered disorders. The EDS score resulted differently distributed across the categories of PHQ-2, GAD-2, and PC-PTSD-5: the EDS median score was higher in the category above the cut-off for symptoms of each of the above-mentioned outcomes (Table 2).

Some variables showed a significant association with each mental health outcome and with EDS, for example, time spent in Italy, type of permit, working in Italy, living in a reception facility, and seeking help from the National Health Service. Other variables reported a significant relationship only with all mental health outcomes, for example, educational level, family in Italy, and perceived health status. Parents’ nationality, perceived economic situation, and reported discrimination revealed a significant association only with EDS score. Other relationships are shown in Table 2.

3.3 | Multivariable regression models

Considering PHQ-2, participants who were waiting for/in possession of temporary permits had a higher likelihood of resulting above the cut-off for depressive symptoms both compared with respondents with Italian nationality (overall model: \( p = 0.001 \)) and to people with a permanent permit (without Italian nationality model: \( p = 0.004 \)). Compared with high school diploma, having an education level lower than high school increased the probability of depressive symptoms both in the overall model \( (p = 0.011) \) and in the model with participants with Italian nationality
## TABLE 1  Descriptive analysis of the sample and χ² analysis and non-parametric tests by Italian nationality

| Variables                        | Overall                  | Italian nationality  |
|----------------------------------|--------------------------|----------------------|
|                                  | N (%) | N (%) | N (%) | p value |
| **Characteristics**              |       |       |       |         |
| Gender                           |       |       |       |         |
| Male                             | 210 (71.7) | 114 (54.3) | 96 (45.7) | 0.025 |
| Female                           | 83 (28.3) | 33 (39.8) | 50 (60.2) |         |
| Age (years)                      | 31 (27–40) | 29 (24–39) | 35 (29–41) | <0.001 |
| Time spent in Italy (months)a    | 204 (72–300) | 96 (36–228) | 252 (228–360) | <0.001 |
| Educational level                |       |       |       |         |
| Lower than high school diploma   | 118 (40.5) | 80 (67.8) | 38 (32.2) | <0.001 |
| High school diploma              | 136 (46.7) | 51 (37.5) | 85 (62.5) |         |
| Higher than high school diploma  | 37 (12.7) | 16 (43.2) | 21 (56.8) |         |
| Working in Italy                 |       |       |       |         |
| No                               | 71 (24.2) | 55 (77.5) | 16 (22.5) | <0.001 |
| Yes                              | 222 (75.8) | 92 (41.4) | 130 (58.6) |         |
| Studying in Italy                |       |       |       |         |
| No                               | 85 (29.1) | 61 (71.8) | 24 (28.2) | <0.001 |
| Yes                              | 207 (70.9) | 86 (41.5) | 121 (58.5) |         |
| Perceived economic situation     |       |       |       |         |
| Good/excellent                   | 51 (17.6) | 37 (72.5) | 14 (27.5) | <0.001 |
| Insufficient/poor                | 239 (82.4) | 109 (45.6) | 130 (54.4) |         |
| Family in Italy                  |       |       |       |         |
| No                               | 136 (46.6) | 104 (76.5) | 32 (23.5) | <0.001 |
| Yes                              | 156 (53.4) | 43 (27.6) | 113 (72.4) |         |
| Someone to trust                 |       |       |       |         |
| No                               | 22 (7.6) | 11 (50) | 11 (50) | 0.987 |
| Yes                              | 267 (92.4) | 134 (50.2) | 133 (49.8) |         |
| Perceived health status          |       |       |       |         |
| Good/excellent                   | 238 (85) | 105 (44.1) | 133 (55.9) | <0.001 |
| Insufficient/poor                | 42 (15) | 37 (88.1) | 5 (11.9) |         |
| Seeking help from NHS            |       |       |       |         |
| No                               | 25 (8.8) | 24 (96) | 1 (4) | <0.001 |
| Yes                              | 258 (91.2) | 119 (46.1) | 139 (53.9) |         |
| Reported discrimination          |       |       |       |         |
| Yes                              | 272 (92.8) | 137 (50.4) | 135 (49.6) | 0.808 |
Having an education level higher than high school diploma increased the probability of depressive symptoms both in the overall model ($p = 0.003$) and in the model with people without Italian nationality ($p = 0.004$).

Among people without Italian nationality, age increased the likelihood of reporting depressive symptoms ($p = 0.003$) and having someone to trust decreased it ($p = 0.042$). Increasing EDS score was associated with depressive symptoms in each model (overall: $p < 0.001$; without Italian nationality model: $p = 0.009$; Italian nationality model: $p = 0.003$) (Table 3).

Regarding findings of anxiety, participants reporting they had someone to trust had a reduced likelihood of having a GAD-2 score above the cut-off for anxiety disorder symptoms (overall model: $p = 0.041$; without Italian nationality model: $p = 0.040$), as well as people who were working in Italy (overall model: $p = 0.005$). Instead, a higher probability was reported for participants who were waiting for/in possession of temporary permits, compared with respondents with a permanent permit (without Italian nationality model: $p = 0.029$), people living in a reception facility (without Italian nationality model: $p = 0.001$), and participants with an education higher than diploma (without Italian nationality model: $p = 0.009$). Increasing EDS score was associated with anxiety symptoms in each model (overall: $p < 0.001$; without Italian nationality model: $p < 0.001$; Italian nationality model: $p = 0.035$) (Table 3).

PTSD was more likely to occur among people who were waiting for/in possession of temporary permits, both compared with participants with Italian nationality (overall model: $p = 0.019$) and to respondents with a permanent

### TABLE 1 (Continued)

| Variables                        | Overall | Italian nationality |
|----------------------------------|---------|---------------------|
|                                  |         | No ($n = 147$)      |
|                                  |         | Yes ($n = 146$)     |
| **Outcomes**                     |         | $p$ value           |
| PHQ-2: Above the cut-off for depressive symptoms | 21 (7.2) | 10 (47.6) | 11 (52.4) | 0.047 |
| Yes                              | 255 (87.9) | 122 (47.8) | 133 (52.2) | 0.047 |
| GAD-2: Above the cut-off for anxiety symptoms | 35 (12.1) | 23 (65.7) | 12 (34.3) | 0.017 |
| No                               | 255 (87.9) | 120 (47.1) | 135 (52.9) | 0.017 |
| Yes                              | 35 (12.1) | 24 (68.6) | 11 (31.4) | 0.017 |
| **PC-PTSD-5:** PTSD              |         |                     |
| No traumatic event               | 181 (62.2) | 68 (37.6) | 113 (62.4) | <0.001 |
| Below the cut-off for PTSD       | 39 (13.4) | 35 (89.7) | 4 (10.3) | 0.003 |
| Above the cut-off for PTSD       | 71 (24.4) | 42 (59.2) | 29 (40.8) | 0.003 |
| EDS: Perceived discrimination    | 5 (3–7) | 4 (2–5) | 5 (5–8) | <0.001 |

Note: Bold values provide significance of $p$ value < .050. $n$ = sample size.

Figures are expressed as number ($N$), column percentages (%) for overall analysis and row percentages (%) for "Italian nationality" analysis. Figures are expressed as median and interquartile range in brackets for: EDS, age, time spent in Italy.

$p$ value obtained via $\chi^2$ test. $p$ value obtained via Mann–Whitney $U$ test for: EDS, age, time spent in Italy.

Abbreviations: EDS, Everyday Discrimination Scale; GAD-2, Generalized Anxiety Disorder-2; NHS, National Health Service; PC-PTSD-5, Primary Care PTSD Screen for DSM-5; PHQ-2, Patient Health Questionnaire-2; PTSD, posttraumatic stress disorder.

*Time spent in Italy was calculated only for participants who were not born in Italy ($n = 243$).
### TABLE 2  Chi-squared analyses by mental health outcomes (PHQ-2; GAD-2; PC-PTSD-5) and non-parametric tests by the perceived discrimination outcome (EDS)

| Variable | PHQ-2: Above the cut-off for depressive symptoms N (%) | GAD-2: Above the cut-off for anxiety symptoms N (%) | PC-PTSD-5 N (%) | EDS median (IQR) |
|----------|-------------------------------------------------------|---------------------------------------------------|-----------------|-----------------|
|          | No (n = 255)                                         | Yes (n = 35)                                     |                 |                 |
|          |                                                      |                                                   |                 |                 |
|          | Yes (n = 255)                                        |                                                    |                 |                 |
|          |                                                      |                                                   |                 |                 |
| PHQ-2: Above the cut-off for depressive symptoms |                                                      |                                                   |                 |                 |
| No       |                                                      |                                                   |                 |                 |
| Yes      |                                                      |                                                   |                 |                 |
| GAD-2: Above the cut-off for anxiety symptoms |                                                      |                                                   |                 |                 |
| p < 0.001 |                                                      |                                                   |                 |                 |
| No       | 242 (95.3)                                           | 12 (4.7)                                         |                 |                 |
| Yes      | 12 (34.3)                                            | 23 (65.7)                                        |                 |                 |
| PC-PTSD-5: PTSD |                                                      |                                                   |                 |                 |
| p < 0.001 | p < 0.001                                            |                                                   |                 |                 |
| No traumatic event | 168 (93.9)                                           | 11 (6.1)                                         |                 |                 |
| Below the cut-off for PTSD | 36 (92.3)                                             | 3 (7.7)                                          |                 |                 |
| Above the cut-off for PTSD | 49 (70.0)                                             | 21 (30.0)                                        |                 |                 |
| Gender | p = 0.967                                             | p = 0.967                                         | p = 0.611       | p = 0.641       |
| Male | 183 (88)                                              | 25 (12)                                          | 126 (60.6)      | 52 (25)         |
| Female | 72 (87.8)                                             | 10 (12.2)                                         | 55 (66.3)       | 19 (22.9)       |
| Age (years) | p = .446                                              | p = 0.045                                         | p < 0.001       | p = 0.007       |
|          | 31 (28–40)                                           | 30 (27–41)                                        | 26 (23–30)      | 30 (26–39)      |
| Time spent in Italy (months) | p = 0.003                                           | p = 0.004                                         | p < 0.001       | p < 0.001       |
|          | 216 (84–300)                                         | 120 (28–264)                                      | 240 (168–336)   | 144 (36–300)    |
| Country of birth | p = 0.71                                              | p = 0.71                                          | p = 0.023       | p = 0.444       |
TABLE 2 (Continued)

| Variable | PHQ-2: Above the cut-off for depressive symptoms N (%) | GAD-2: Above the cut-off for anxiety symptoms N (%) | PC-PTSD-5 N (%) | EDS median (IQR) |
|----------|--------------------------------------------------------|---------------------------------------------------|-----------------|------------------|
|          | No (n = 255) | Yes (n = 35) | No (n = 255) | Yes (n = 35) | No events (n = 181) | Below the cut-off for PTSD (n = 39) | Above the cut-off for PTSD (n = 71) | (IQR) |
| Italy    | 211 (87.9)  | 29 (12.1)  | 211 (87.9)  | 29 (12.1)  | 143 (59.3)  | 38 (15.8)  | 60 (24.9)  | 5 (3–7) |
| Other    | 44 (89.8)   | 5 (10.2)   | 44 (89.8)   | 5 (10.2)   | 37 (75.5)   | 1 (2)      | 11 (22.4)  | 5 (4–8) |

| Type of permit | p < 0.001 | p < 0.001 | p < 0.001 | p < 0.001 |
|----------------|-----------|-----------|-----------|-----------|
| Italian nationality | 133 (91.7) | 12 (8.3) | 135 (92.5) | 11 (7.5) | 113 (77.4) | 4 (2.7) | 29 (19.9) | 5 (5–8) |
| With a permanent permit | 49 (98) | 1 (2) | 48 (96) | 2 (4) | 39 (81.3) | 2 (4.2) | 7 (14.6) | 5 (4–6) |
| Waiting for/in possession of temporary permits | 68 (75.6) | 22 (24.4) | 67 (75.3) | 22 (24.7) | 26 (28.3) | 32 (34.8) | 34 (37) | 3 (1–5) |

| Nationality<sup>b</sup> | p = 0.455 | p = 0.38 | p = 0.035 | p = 0.016 |
|--------------------------|-----------|-----------|-----------|-----------|
| Northern Africa | 30 (88.2) | 4 (11.8) | 30 (88.2) | 4 (11.8) | 22 (66.7) | 5 (15.2) | 6 (18.2) | 2 (0–5) |
| Sub-Saharan Africa | 92 (82.9) | 19 (17.1) | 90 (81.8) | 20 (18.2) | 46 (41.1) | 30 (26.8) | 36 (32.1) | 4 (2–6) |

| Parents’ Nationality<sup>c</sup> | p = 0.135 | p = 0.176 | p = 0.797 | p = 0.001 |
|-------------------------------|-----------|-----------|-----------|-----------|
| Northern Africa | 37 (97.4) | 1 (2.6) | 37 (97.4) | 1 (2.6) | 31 (81.6) | 1 (2.6) | 6 (15.8) | 5 (0–5) |
| Sub-Saharan Africa | 94 (89.5) | 11 (10.5) | 96 (90.6) | 10 (9.4) | 81 (76.4) | 3 (2.8) | 22 (20.8) | 5 (5–9) |

| Educational level | p < 0.001 | p = 0.003 | p < 0.001 | p = 0.516 |
|-------------------|-----------|-----------|-----------|-----------|
| Lower than high school diploma | 93 (79.5) | 24 (20.5) | 94 (81) | 22 (19) | 56 (47.9) | 28 (23.9) | 33 (28.2) | 5 (2–7) |
| High school diploma | 129 (96.3) | 5 (3.7) | 128 (94.8) | 7 (5.2) | 96 (70.6) | 10 (7.4) | 30 (22.1) | 5 (4–7) |
| Higher than high school diploma | 31 (83.8) | 6 (16.2) | 31 (83.8) | 6 (16.2) | 27 (75) | 1 (2.8) | 8 (22.2) | 4 (3–5) |

| Working in Italy | p < 0.001 | p < 0.001 | p < 0.001 | p = 0.002 |
|------------------|-----------|-----------|-----------|-----------|

(Continues)
| Variable                      | No (n = 255) | Yes (n = 35) | No (n = 255) | Yes (n = 35) | PC-PTSD-5 N (%) | EDS median (IQR) |
|-------------------------------|--------------|--------------|--------------|--------------|----------------|------------------|
|                               |              |              |              |              |                |                  |
|                               |              |              |              |              | No events (n = 181) | Below the cut-off for PTSD (n = 39) | Above the cut-off for PTSD (n = 71) |
| Studying in Italy             | p = 0.618    | p = 0.907    | p = 0.129    | p = 0.075    |                |                  |
| No                            |              |              |              |              |                |                  |
|                               | 52 (75.4)    | 17 (24.6)    | 51 (73.9)    | 18 (26.1)    | 22 (31)        | 21 (29.6)        | 28 (39.4)         | 4 (2–5)           |
| Yes                           |              |              |              |              | 203 (91.9)     | 18 (8.1)         | 204 (92.3)        | 17 (7.7)          | 159 (72.3)        | 18 (8.2)         | 43 (19.5)         | 5 (4–7)          |
| Perceived economic situation  | p = 0.052    | p = 0.154    | p = 0.603    | p = 0.001    |                |                  |
| Good/excellent                |              |              |              |              |                |                  |
|                               | 48 (96)      | 2 (4)        | 46 (93.9)    | 3 (6.1)      | 34 (68)        | 6 (12)          | 10 (20)           | 4 (2–5)           |
| Insufficient/poor             |              |              |              |              | 205 (86.1)     | 33 (13.9)       | 206 (86.6)        | 32 (13.4)         | 144 (60.5)        | 33 (13.9)       | 61 (25.6)        | 5 (4–7)          |
| Family in Italy               | p = 0.005    | p = 0.001    | p = 0.001    | p = 0.123    |                |                  |
| No                            |              |              |              |              |                |                  |
|                               | 110 (82.1)   | 24 (17.9)    | 108 (81.2)   | 25 (18.8)    | 65 (48.1)      | 30 (22.2)       | 40 (29.6)         | 5 (3–6)           |
| Yes                           |              |              |              |              | 145 (92.9)     | 11 (7.1)      | 146 (93.6)        | 10 (6.4)          | 115 (74.2)        | 9 (5.8)         | 31 (20)          | 5 (4–8)          |
| Someone to trust              | p = 0.289    | p = 0.080    | p = 0.054    | p = 0.599    |                |                  |
| No                            |              |              |              |              |                |                  |
|                               | 17 (81)      | 4 (19)       | 16 (76.2)    | 5 (23.8)     | 9 (40.9)       | 3 (13.6)        | 10 (45.5)         | 5 (2–5)           |
| Yes                           |              |              |              |              | 236 (88.7)     | 30 (11.3)     | 236 (89.1)        | 29 (10.9)         | 169 (63.8)        | 35 (13.2)       | 61 (23)          | 5 (3–7)          |
| Living in a reception facility| p = 0.017    | p < 0.001    | p < 0.001    | p < 0.001    |                |                  |
| No                            |              |              |              |              |                |                  |
|                               | 218 (89.7)   | 25 (10.3)    | 222 (91.7)   | 20 (8.3)     | 170 (70.5)     | 17 (7.1)       | 54 (22.4)         | 5 (4–8)           |
| Yes                           |              |              |              |              | 33 (76.7)      | 10 (23.3)     | 29 (67.4)         | 14 (32.6)         | 8 (17.8)         | 20 (44.4)       | 17 (37.8)       | 3 (1–5)          |
| Perceived health status       | p < 0.001    | p = 0.001    | p < 0.001    | p = 0.663    |                |                  |
| Good/excellent                |              |              |              |              |                |                  |
|                               | 216 (91.5)   | 20 (8.5)     | 214 (90.7)   | 22 (9.3)     | 160 (67.5)     | 28 (11.8)      | 49 (20.7)         | 5 (3–7)           |
| Variable                        | No (n = 255) | Yes (n = 35) | No (n = 255) | Yes (n = 35) | No events (n = 181) | Below the cut-off for PTSD (n = 39) | Above the cut-off for PTSD (n = 71) | EDS median (IQR) |
|--------------------------------|--------------|--------------|--------------|--------------|-------------------|------------------------------------|------------------------------------|------------------|
| Insufficient/poor              | 29 (69)      | 13 (31)      | 30 (73.2)    | 11 (26.8)    | 12 (29.3)         | 10 (24.4)                          | 19 (46.3)            | 5 (2–9)          |
| Seeking help from NHS          |              |              |              |              |                   |                                    |                      |                  |
| No                             | 19 (76)      | 6 (24)       | 17 (68)      | 8 (32)       | 4 (16)            | 11 (44)                            | 10 (40)              | 3 (2–5)          |
| Yes                            | 229 (89.5)   | 27 (10.5)    | 230 (90.2)   | 25 (9.8)     | 170 (66.4)        | 28 (10.9)                          | 58 (22.7)            | 5 (3–7)          |
| Reported discrimination        |              |              |              |              |                   |                                    |                      |                  |
| Yes                            | 237 (88.1)   | 32 (11.9)    | 238 (88.5)   | 31 (11.5)    | 165 (61.1)        | 36 (13.3)                          | 69 (25.6)            | 5 (4–7)          |
| No                             | 18 (85.7)    | 3 (14.3)     | 17 (81)      | 4 (19)       | 16 (76.2)         | 3 (14.3)                          | 2 (9.5)              | 0 (0–1)          |

Note: Bold values provide significance of p value < .050. n = sample size.

Figures are expressed as number (N) and row percentages (%). Figures are expressed as median and interquartile range in brackets for: EDS, age, time spent in Italy.

PHQ-2, GAD-2, PC-PTSD-5: p value obtained via χ² test, except for age and time spent in Italy (Mann–Whitney U test).

EDS: p value obtained via Mann–Whitney U test (or Kruskal–Wallis test), except for age and time spent in Italy (univariable linear regression. Figures are unstandardized coefficients B).

Abbreviations: EDS, Everyday Discrimination Scale; GAD-2, Generalized Anxiety Disorder-2; Neg., negative; NHS, National Health Service; PC-PTSD-5, Primary Care PTSD Screen for DSM-5; PHQ-2, Patient Health Questionnaire-2; Pos., positive; PTSD, posttraumatic stress disorder.

aTime spent in Italy was calculated only for participants who were not born in Italy (n = 243).

bNationality calculated only among participants without Italian nationality.

cNationality of parents calculated only among participants with Italian nationality.
| TABLE 3 | Multivariable regression models considering the whole sample and stratified by nationality |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                | PHQ-2            | GAD-2           | PC-PTSD-5       | EDS             |
|                | Overall sample   | Participants    | Participants    | Overall sample  | Participants    | Participants    |
|                | adjOR (95% CI)   | without Italian | without Italian | adjOR (95% CI)  | without Italian | without Italian |
| Overall sample | 1.0 (0.9; 1.1)   | 1.1 (1.0; 1.2)  | 1.0 (0.9; 1.1)  | 1.0 (0.9; 1.1)  | 1.0 (0.9; 1.1)  | 1.0 (0.9; 1.1)  |
| Italian        | Ref.             | -               | -               | Ref.            | -               | -               |
| nationality    |                  |                  |                  |                 |                  |                  |
| With a permanent | 0.3 (0.03; 2.4)  | -               | -               | 0.4 (0.1; 2.3)  | -               | 0.9 (0.4; 2.7)  |
| permit         |                  |                  |                  | -               |                  | -               |
| Waiting for/   | 5.6 (2.1; 15.0)  | -               | -               | 2.7 (0.8; 8.9)  | -               | 3.0 (1.2–7.5)   |
| in possession of |                  |                  |                  | -               |                  |                  |
| temporary permits |                 |                  |                  | -               |                  | -               |
| High school diploma | Ref. | Ref. | Ref. | Ref. | Ref. | Ref. |

* indicates statistical significance.
| TABLE 3 (Continued) | PHQ-2 | GAD-2 | PC-PTSD-5 | EDS |
|---|---|---|---|---|
| | Overall sample | Participants without Italian nationality | Participants with Italian nationality | Overall sample | Participants without Italian nationality | Participants with Italian nationality | Overall sample | Participants without Italian nationality | Participants with Italian nationality |
| adjOR (95% CI) | adjOR (95% CI) | adjOR (95% CI) | adjOR (95% CI) | adjOR (95% CI) | adjOR (95% CI) | adjOR (95% CI) | adjB (95% CI) | adjB (95% CI) | adjB (95% CI) |
| **Lower than high school diploma**<br>adjOR (95% CI)<br>6.5 (0.8; 51.0) | 8.4 (1.5; 46.7)* | - | 1.4 (0.2; 9.6) | 3.0 | - | 0.3 (0.1; 1.0) | - | - | - |
| **Higher than high school diploma**<br>adjOR (95% CI)<br>8.4 (2.0; 34.5)* | 44.0 (3.3; 592.4)* | 1.6 (0.1; 18.1) | 22.2 (2.2; 224.8)* | 1.2 (0.1; 12.0) | - | 1.5 (0.3; 7.6) | - | - | - |
| **Perceived economic situation: insufficient/poor**<br>adjOR (95% CI)<br>3.9 (0.8; 19.7) | 3.5 (0.4; 29.3) | - | - | - | - | - | 1.34 (0.41; 2.28)* | 2.07 (0.86; 3.22)* | - |
| **Perceived health status: Insufficient/poor**<br>adjOR (95% CI)<br>- | - | - | - | - | - | 2.7 (1.1; 6.9)* | 2.5 (0.9; 7.0) | 0.1 (−0.2; 2.0) | 3.3 (0.7; 5.9)* |
| EDS score | - | - | - | - | - | - | - | - | - |

(Continues)
### Table 3 (Continued)

|                        | PHQ-2 | GAD-2 | PC-PTSD-5 | EDS |
|------------------------|-------|-------|-----------|-----|
|                        | Overall sample | Participants without Italian nationality | Participants with Italian nationality | Overall sample | Participants without Italian nationality | Participants with Italian nationality | Overall sample | Participants without Italian nationality | Participants with Italian nationality |
| **adjOR (95% CI)**     |   |       |           |     |       |           |       |       |           |     |
| Waiting for/in possession of temporary permits | 1.3 (1.2; 1.5) * | 1.3 (1.1; 1.5) * | 1.7 (1.2; 2.4) * | 1.4 (1.2; 1.6) * | 1.5 (1.2; 1.9) * | 1.4 (1.0; 1.8) * | 1.3 (1.1; 1.4) * | 1.4 (1.2; 1.6) * | 1.2 (1.0; 1.4) * |
| Studying in Italy:     | - | 5.29 (0.9; 28.8) | - | - | - | 0.4 (0.1; 3.2) | 3.4 (1.4; 8.3) * | 2.4 (0.9; 7.0) | 7.0 (0.8; 58.9) | - | - |
| Yes                    | - | 0.1 (0.01; 0.9) * | 0.8 (0.1; 8.6) | 0.36 (0.1; 0.9) * | - | - | - | - | - | - |
| Someone to trust:      | - | 0.2 (0.02; 1.2) | - | - | - | - | - | - | - | - |
| Yes                    | - | - | - | - | - | - | - | - | - | - |
| Northern Africa        | - | 0.5 (0.1; 4.2) | - | - | - | - | - | - | - | - |
| (personal nationality)| - | - | - | - | - | - | - | - | - | - |

* p < 0.05
| TABLE 3 (Continued) | PHQ-2 | GAD-2 | PC-PTSD-5 | EDS |
|---------------------|-------|-------|-----------|-----|
| Overall sample      |       |       |           |     |
| Participants without Italian nationality |       |       |           |     |
| adjOR (95% CI)      |       |       |           |     |
| Northern Africa (parents’ nationality) |       |       |           |     |
|                     | 0.5   |       |           | -2.49 | (−3.44; −1.55) |
|                     | (0.04; 5.7) |       |           |     |
| Working in Italy:    | -     | -     | -         | -   |
| Yes                 | 0.2 (0.1; 0.6) | -     | -         | -   |
| Family in Italy:     | -     | -     | -         | -   |
| Yes                 | 0.3   |       |           | -   |
|                     | (0.1; 1.0) |       |           | -   |
| Living in a reception facility: | -     | -     | -         | -   |
| Yes                 | 24.9  |       |           | -2.4 | (−3.75; −1.06) |
|                     | (3.7; 166.1) |       |           |     |

Note: Bold values provide significance of p value < .050.

Abbreviations: adjB, adjusted B; adjOR, adjusted odds ratio; CI, confidence interval; EDS, Everyday Discrimination Scale; GAD-2, Generalized Anxiety Disorder-2; PC-PTSD-5, Primary Care PTSD Screen for DSM-5; PHQ-2, Patient Health Questionnaire-2.

*p < 0.050.
permit (without Italian nationality model: $p = 0.020$). Also students (overall model: $p = 0.009$) and those with an insufficient/poor perceived health status (overall model: $p = 0.034$) had a higher likelihood of reporting PTSD. Instead, participants who were working in Italy reported a reduced probability (overall: $p = 0.044$; without Italian nationality model: $p = 0.039$). Increasing EDS score was associated with PTSD in each model (overall: $p < 0.001$; without Italian nationality model: $p < 0.001$; Italian nationality model: $p = 0.031$) (Table 3).

Lastly, waiting for/in possession of temporary permits, compared with having Italian nationality (overall model: $p < 0.001$) and living in a reception facility (without Italian nationality model: $p = 0.001$) were negatively associated with EDS score. An insufficient/poor economic situation was positively associated with EDS score (overall: $p = 0.005$; without Italian nationality model: $p = 0.001$), as well as an insufficient/poor perceived health status (Italian nationality model: $p = 0.013$). Compared with Sub-Saharan Africa, Northern Africa was negatively correlated to EDS score, both considering nationality of participants (without Italian nationality model: $p = 0.003$) and parents’ nationality (Italian nationality model: $p < 0.001$) (Table 3).

4 | DISCUSSION

This paper aimed to explore depression, anxiety, and PTSD among African migrants in Italy. Additionally, perceived discrimination was evaluated.

The results showed a high frequency of mental health issues. Indeed, 12.1% showed depressive symptoms and 12.1% anxiety symptoms. These findings seem consistent with existing studies. A recent meta-analysis calculated a depression prevalence of 15.6% among migrants worldwide (Foo et al., 2018). Previous data outlined a big variety in prevalence. Considering migrants from various countries, the prevalence resulted to be from 3% to 81% for depression and from 5% to 90% for anxiety (Lindert et al., 2008).

Considering the variables associated with depressive risk, subjects that defined their health status insufficient/poor showed an increased risk of depression, confirming results that showed that self-rated health was a depression predictor up to 5 years (Ambresin et al., 2014). Employed subjects reported a lower risk of depressive symptoms, coherently with findings that highlighted effects of unemployment can be magnified among minorities (Paul & Moser, 2009). Furthermore, we found participants waiting for/in possession of temporary permits were more likely to report symptoms, similarly to a study showing that a long wait for a legal residency status was associated with psychopathologies (Laban et al., 2008). Data also hint that aspects related to integration, for example, having someone to trust or having a job, might have a role in depression and anxiety. These data seem to confirm previous findings that outlined the role of poor social integration in increasing mental illness in this population (Giacco et al., 2018).

The PTSD prevalence was remarkably high. About a quarter of the sample was above the cut-off for PTSD. The frequency of PTSD is hard to compare with other studies considering the high variability of the results. Indeed, previous works showed a PTSD prevalence ranging from 4% to 86% (Lindert et al., 2008). Other papers have already tried to explain the increased rate of PTSD in this population, suggesting that exposure to traumatic events before or during migration plays a role (Giacco et al., 2018).

A vast majority reported discrimination. Based on our results, migrants who reported more discrimination were Italians with Sub-Saharan Africa’s parents and a poor economic status. This can be explained by greater expectancies that second-generation migrants have towards western lifestyle (King & Lulle, 2016). Furthermore, the likelihood of all mental health outcomes was significantly increased by the discrimination, consistently with previous findings that reported the discrimination as a determinant of poor mental health among migrants (Hynie, 2018).

This study presents some limitations. Considering numerous existing barriers, quantitative data are not easy to collect to assess this specific topic. We tried to overcome this limitation by using validated tests (or slightly modified versions) translated in different languages; nevertheless, an additional weakness of our paper is represented by the fact that we did not validate the translation of two scales nor the modified EDS. However, migrants are a
heterogeneous group, with relevant differences between asylum seekers and refugees, “voluntary” long term migrants and “involuntary” migrants (Lindert et al., 2008); therefore, a greater sample size with enough participants to represent each category would improve the study of this issue. Additionally, the decision to analyze only African migrants limits the generalizability of results. Also, the used tools are screening instruments and cannot assess the prevalence of a diagnosed disorder. Lastly, the cross-sectional design restricts causal interpretation and convenience sampling increases the possibility of a selection bias.

Nevertheless, the results showed a substantial prevalence of mental symptoms, suggesting that this issue deserves further studies. These findings are relevant considering that Italy is one of the European countries with a particularly limited access to health care for non-European migrants (Rosano et al., 2017), thus highlighting the urgent need of addressing more resources to improve the access to care not only for physical health but also for mental health. Moreover, our research added evidence about the burden of discrimination among migrants in Italy and its strong link with poor mental health also outside the workplace, which was the only setting where this condition was thoroughly explored (Di Napoli et al., 2017). Last, European countries should face this important public health priority by improving the implementation of programs of health monitoring at national and international levels.

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CONFLICT OF INTERESTS
The authors declare that there are no conflict of interests.

ETHICAL APPROVAL
This study was conducted according to the guidelines laid down in the Declaration of Helsinki. The Ethics Committee of the University of Torino reviewed and approved the protocol (Protocol number 250096).

PEER REVIEW
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DATA AVAILABILITY STATEMENT
All relevant data are within the paper.

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