








# Psychological distress among unemployed migrants settling in southwestern Spain

## A cross-sectional study

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### Abstract

Migrants living in the informal settlements of Southern Spain tend to have precarious employment and poor living conditions, making them vulnerable to mental health issues. This study aimed to assess psychological distress in a sample of unemployed migrants residing in informal settlements in the province of Huelva (southern Spain), during the fourth wave of the COVID-19 pandemic. A descriptive cross-sectional study was conducted during the months of April to June 2021, through a heteroadministered questionnaire, in informal settlements. The measurement instrument was the General Health Questionnaire (GHQ-12), used to analyze psychological distress, and other sociodemographic and health-related variables. Univariate and bivariate descriptive data analysis were performed, using the nonparametric statistics Mann-Whitney *U* test, Kruskal-Wallis *H* test, and Tau  $\beta$  correlation. A categorical regression analysis was performed to study the relationship between psychological distress and the rest of the variables. The sample consisted of 317 subjects, 83.9% of whom were males, and the mean age was 33.4 years (SD = 10.7 years). The mean score obtained in the GHQ-12 questionnaire was 13.69 points (SD = 3.86). Significant differences were found between levels of psychological distress and substance abuse ( $H = 14.085$ ;  $P = .049$ ), people who wished to stay in Spain ( $t = 6987$ ;  $P = .049$ ), people who experienced isolation due to COVID-19 contact ( $t = 1379.5$ ;  $P = .001$ ), people who needed medical assistance due to COVID-19 ( $t = 7.990$ ;  $P = .018$ ), and those who reported having chronic illnesses ( $t = 2686.5$ ,  $P = .02$ ). The mean score of psychological distress indicates general high levels of psychological distress. Participants who had experienced isolation due to COVID-19 contact, who consumed substances, and who had chronic illnesses reported the highest levels of psychological distress.

**Abbreviations:** COVID-19 = coronavirus disease 2019, GHQ-12 = General Health Questionnaire, IQR = Interquartile Range, SARS-CoV-2 = Severe Acute Respiratory Syndrome Coronavirus 2.

**Keywords:** COVID-19, informal settlements, migrants, psychological distress, public health, unemployment

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All data generated or analyzed during this study are included in this published article [and its supplementary information files].

Permission was obtained from the Research Ethics Committee of the Regional Government of Andalusia (Ref. 1539-N-20). All the subjects in the sample gave their voluntary, written consent and were informed about the aims of the study. All subjects were informed of the purpose of the study and the possibility of participating in it voluntarily, anonymously, and confidentially.

Unemployed migrants living in informal settlements in Huelva showed high levels of psychological distress.

Contact with COVID-19 and substances consumption reported the highest levels of psychological distress.

The vulnerable population that resides in the informal settlements had precarious employment and poor living conditions.

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## 1. Introduction

Migratory movements have been part of civilization since the beginning of time to satisfy basic needs or as a consequence of health crises, climate change, war, and persecution. In a highly interconnected and globalized world, the impact of the SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) pandemic has been described at the social, occupational, and economic levels. Despite being considered a worldwide health emergency, its consequences have not been exclusively health-related, and it has particularly affected the most vulnerable groups, such as migrant workers.<sup>[1]</sup>

According to the glossary on migration proposed by the International Organization for Migration,<sup>[2]</sup> migration is understood as the movement of people regardless of their size as a group, composition, or causes, to the territory of another State or within the own State; it therefore includes the migration of refugees, displaced persons, uprooted persons, economic migrants, among others. In Spain, 1 out of 5 people lives in settlements, especially in the Andalusia region.<sup>[3]</sup> Although it is a heterogeneous group, they may have a series of common characteristics, especially related to socioeconomic determinants of health. These determinants include lack of economic resources as a result of low-skilled jobs or unemployment, labor, socio-environmental, and housing conditions, problems related to social status and discrimination, an irregular administrative situation, and lack of social or family support networks.<sup>[4-6]</sup>

In this sense, the province where the study was carried out (Huelva, in the south of Spain) stands out for its intensive, export-oriented agriculture, where a high number of seasonal workers are required to work on seasonal crops and no qualification is required. In fact, it is estimated that 3 out of 10 workers in the agricultural sector are immigrants.<sup>[7]</sup> The high cost of buying and/or renting housing means that they have to build a place to live. In some cases, these are permanent residences where almost all migrants are young people from Africa, and are usually close to farms and far from villages or towns.<sup>[8,9]</sup> This means that they have no access to electricity (neither legally nor illegally), they have to use water from wells or walk 5 to 10 kilometers to collect drinking water in large cans they find in the rubbish, and they build their substandard dwellings with materials they collect from the street, without thermal insulation and thus being potentially flammable.<sup>[9]</sup> Another phenomenon that often occurs in this context is that many people are hired in their country of origin and do not return at the end of the agricultural season, so they lack the resources to pay for housing. Moreover, since they do not have a work permit, they cannot get a rental contract.<sup>[9]</sup>

In the face of all these chronic difficulties, the pandemic hit this vulnerable population particularly hard. In Spain, the situation of COVID-19 (coronavirus disease 2019) in terms of cases diagnosed from April to June 2021 (the context in which the study takes place), went from around 3,100,000 total cases in Spain at the beginning of April, for an approximate total population of 47,500,000 people, to 3,800,000 total cases diagnosed at the end of June. Likewise, the cumulative incidence decreased from 72.7 to 55.4 cases per 100,000 inhabitants during this period.<sup>[10]</sup>

Formerly, the political authorities around the world, supported by scientific evidence, recommended the implementation of strategies aimed at preventing infection during the course of the pandemic; some of these measures included physical isolation, proper hand hygiene, teleworking, limited personal contact and the use of masks.<sup>[5]</sup> In the specific case of migrants living in informal settlements, the adoption of many of these measures had not been exhaustive. The implementation of protective measures has been subject to the structural conditions of the settlements, the mobility of migrants due to labor reasons, and the close contact between people due to the sharing of common spaces.<sup>[11]</sup> Equally, a low COVID-19 testing rate in these

settlements was a contributing factor for a low rate of reported cases, and the refugees who were infected with COVID-19 may have gone unnoticed by this issue.<sup>[12]</sup>

On the other hand, the impact of the COVID-19 pandemic on settled migrants' has intensified preexisting social inequalities in these settings, such as forced displacement, disruptions of necessary health services and reduction of social networks, thus affecting their mental health status.<sup>[13,14]</sup> In the general population, the course of the pandemic has worsened mental health levels, leading in some cases to an increase in the demand for psychological care.<sup>[15]</sup> In addition, situations such as isolation, loss of income or fear have led to the onset or aggravation of mental health disorders, with an increase in alcohol or drug use, sleep disorders, and problems related to stress and anxiety.<sup>[16]</sup>

In general, people living in informal settlements tend to work in sectors which are considered low-skilled, low-paying, temporary jobs.<sup>[17]</sup> As a result of the pandemic, the labor sector had to adapt suddenly and temporarily to minimize the transmissibility of the virus. In this regard, many jobs were forced to close permanently or temporarily, and in other cases, the workers had to adapt their daily tasks.<sup>[18]</sup> When a vulnerable population such as that of migrants living in informal settlements lose their jobs, they have to cope with loss of income, food shortages, family worries, and uncertainty about their future,<sup>[19,20]</sup> and this worsening of socio-economic conditions together with the loss of employment for low-income individuals increases the risk of developing psychiatric disorders,<sup>[21]</sup> such as psychological distress, depressive disorders, anxiety disorders, and substance use disorders.<sup>[22]</sup> Psychological distress refers to a range of nonspecific symptoms of stress, anxiety and depression that can trigger and act as signs of common mental disorders, such as depressive and anxiety disorders.<sup>[23]</sup> Migrants are often considered a particularly vulnerable group in terms of mental health in European host countries.<sup>[24]</sup> In fact, the prevalence of mental disorders among the irregular migrant population in Europe varies widely, ranging from 8% to 86% for depression, from 3.1% to 81% for anxiety levels, and from 3.4% to 57.6% for the development of post-traumatic stress disorder.<sup>[25]</sup> In addition, when migrant workers lose their jobs, they often have no financial compensation for dismissal or assistance from the State for being in an irregular employment situation, which further affects their lack of resources.<sup>[26,27]</sup>

### 1.1. Aims

In a scenario such as this, where the pandemic has had a particular impact on the most vulnerable groups, it is necessary to focus on and dive deeper into a hitherto unknown reality. Thus, assessing the level of psychological distress in unemployed people whose main means of sustenance is their working activity, and who may suffer from lack of savings and poor working, environmental, housing, etc. conditions, can lead to a number of public health consequences, such as an increased likelihood of developing infectious and mental illnesses, a higher risk of social and labor exclusion, and long working hours, among others. At this point, the dichotomy of wanting to stay in the country but having no resources due to unemployment may exist, with the subsequent increase in psychological distress. In this context, the aim of this study was to assess psychological distress on a sample of unemployed migrants residing in informal settlements in the province of Huelva (southern Spain), during the fourth wave of the COVID-19 pandemic.

## 2. Materials and methods

### 2.1. Study design

Observational, cross-sectional study. It was conducted during the months of April to June, in 2021, in the province

of Huelva (Spain). Bureaucratic restrictions and difficulty of access to the study population prevented the study from being carried out during the first and second waves of the COVID-19 pandemic. The STROBE guidelines were followed.

## 2.2. Population and sample

There is no official registry of people residing in informal settlements at southern Spain. According to estimates by Cruz Roja Huelva (Red Cross at Huelva), an organization participating in the present study, an approximate population size of 5000 individuals, employed or unemployed, was estimated (confidence level (CI) = 95%. Precision = 3%;  $\alpha$  error = 0.05; Assumed loss = 25%). Therefore, a necessary sample of at least 260 subjects was anticipated. Finally, the sample consisted of a total of 317 unemployed migrants. The inclusion criteria were: being migrant, belonging to one of the informal settlements in the province of Huelva, speaking and/or understanding Spanish, French and Arabic, as these are the majority languages in the migrants' countries of origin, who voluntarily accepted to participate in the study, to be unemployed since the onset of the pandemic and not receiving any remuneration for work activities without an official employment contract, and declaration of being over 16 years of age. Exclusion criteria included: to be employed, with formal contract or not, not understanding the study by their own means or through cultural mediators, and not signing the informed consent form for whatever reason.

A non-probabilistic snowball sampling was used, with the help of acknowledged cultural mediators and informal leaders of the potential study population. The informal leaders, residents of the settlements for more than 10 years and regular collaborators of the Red Cross NGO, are referents among the migrant community in each settlement; they also know the approximate sample size of these settlements, and they are informed about the arrival of new migrants to the settlements. Prior to the start of the study, after having accepted to participate on a voluntary basis, they received training and coaching from the research team and Red Cross NGO cultural mediators on the objectives of the study and the data collection procedure. The instruction for informal leaders was to identify all possible individuals who wished to voluntarily participate in the study, regardless of their country of origin, language, or legal status in the country. Their mission was to recruit sample and solve minor language or cultural problems, if any.

The data collection process was carried out by the team of Red Cross NGO cultural mediators, accompanied by the informal leaders, on different sampling days, on foot through the settlements. The cultural mediators are culturally experienced professionals, as they carry out their work in prevention and health promotion on a regular basis for the Red Cross NGO in these settlements, and are also competent in English, French and Spanish. As for the informal leaders, all of them understood Spanish and, at least, French (as well as native languages), which were the priority languages in these settlements. In addition, the interviewed subjects facilitated the identification of other potential informants in a consecutive manner, as they felt they trusted the data collectors.

To collect the information provided by the sample, an online questionnaire was utilized (Google, US), which contained information about the study and the informed consent, in addition to the rest of the items related to the study variables. This questionnaire was available in Spanish, French, and Arabic. The questionnaire was administered with the help of Red Cross NGO cultural mediators to help with information and technological comprehension.

## 2.3. Patient and public involvement

Before completing the questionnaire, 10 people were involved in the design of this study through a pilot study. These subjects were identified and recruited with the help of the Red Cross of Spain, among key informants and reference persons who reside in the settlements and who are contact persons for the organization. Ten men, whose country of origin was Morocco, Mali, or Ghana, responded to the interviews. No modifications were necessary, as none of the subjects reported comprehension difficulties or other issues.

## 2.4. Variables

Considering the existing literature on the study topic and the stated objectives, the following variables were identified: socio-demographic variables (sex, age, country of origin, desire to return to the country of origin, work permit, and highest level of education), health-related variables (chronic disease, substance abuse, COVID-19 diagnosis, isolation related to COVID-19 risk contact, and COVID-19 medical assistance needed), and psychological distress (GHQ-12 scale,<sup>[28]</sup>).

## 2.5. Instrument

The General Health Questionnaire (GHQ-12) is an instrument utilized for screening of nonpsychotic psychiatric disorders (Original Cronbach's alpha<sup>[28]</sup>: 0.82–0.86; Spanish version<sup>[29]</sup>: 0.86–0.76; Arabic version alpha<sup>[30]</sup>: 0.86; French version alpha<sup>[31]</sup>: 0.94). The correction scale is Likert-type 0-1-2-3, with a maximum score of 36 points. The total score is calculated by adding the scores obtained on all items of the scale; as the scores increase, the level of mental health decreases. Scores  $\geq 12$  were considered as potential cases of psychiatric morbidity. All versions have the same cutoff point as described above, and were these versions used in this study.

A recent study carried out a two-factor modeling that showed that most of the variance was explained by one general factor. Therefore, these authors demonstrated that GHQ-12 is an essentially unidimensional scale, and it is not recommended to use and interpret subscale scores because they mainly reflect general mental health and not distinct constructs.<sup>[32]</sup>

## 2.6. Data analysis

Univariate and bivariate descriptive data were analyzed using SPSS Software v.26 (IBM, Armonk, NY),<sup>[33]</sup> in relation to socio-demographic variables, health-related variables, and scale variables. The Kolmogorov-Smirnov test performed on the scale variable (total score on the GHQ-12 questionnaire) showed that the data distribution was not normal, so nonparametric statistics were used.

For data analysis, descriptive statistics of median and interquartile range (IQR) were used, as well as contrast tests: Mann-Whitney *U* test, to contrast psychological distress with the isolation, medical assistance, chronic disease, and willing to return variables; Kruskal-Wallis *H* test, to contrast psychological distress with the substance abuse variable; and Tau  $\beta$  correlation, to study the association between psychological distress and age. A confidence level of 95% was established for all the statistical tests applied.

To study the relationship between the psychological distress and the variables that showed statistically significant differences in the bivariate analysis, a categorical regression analysis was performed as these variables were qualitative. The categorical regression analysis included characteristic aspects of classical regression analysis coefficient of determination ( $R^2$ ), analysis of variance for regression, and significance of the model parameters. The optimal scale option was selected in the software, and dummy variables were introduced to calculate the final model.<sup>[34,35]</sup>

## 2.7. Ethical aspects

The Research Ethics Committee of the Regional Government of Andalusia (Ref. PI 036/20) approved the protocol of this study. All the subjects in the sample gave their voluntary, written consent and were informed about the aims of the study. Confidentiality and anonymization were ensured in all the participants. All subjects were informed of the purpose of the study and the possibility of participating in it voluntarily, anonymously, and confidentially. The authors have permission to use this instrument from the copyright holders.<sup>[28]</sup>

## 3. Results

The sample consisted of 317 subjects, where 83.9% of them were men, and the median age of the total sample was 36 years (IQR = 14 years). In relation to the level of education, 83.6% had primary education or not completed a minimum education, 13.2% had secondary education, and only 3.1% had completed higher education. The sociodemographic profile of the sample is described in Table 1.

Regarding the marital status, 49.5% were singles and 41.3% were married; the rest of the sample were divorced, engaged, or widowed. About the migration process, 83.6% of the total sample did not wish to return to their country of origin. In relation to health-related variables, only 8% had a chronic disease, 6.6% had suffered an isolation related to COVID-19, and 2.8% had been COVID-19 diagnosed; among them, only 5 subjects had needed medical assistance in a hospital (1.6%).

According to the countries of origin of the sample, 94% of the sample came from Africa, with higher percentages from the countries of Morocco (27.93%), Mali (27.29%), Ghana (21.19%), and Senegal (8.83%); the remaining 6% came from European countries.

The median score for the level of psychological distress, assessed by GHQ-12 scale was 13.69 points (IQR = 5). This score is higher than 12, and this would indicate that the sample is suffering from psychological distress.

No significant differences were found between levels of psychological distress and sex, marital status, educational level, work permit, and COVID-19 diagnosis variables in the bivariate analysis.

The differences between the mean scores of GHQ-12 and substance abuse was significant ( $H = 14.085$ ;  $P = .049$ ). Hence, polyconsumers (regular abuse of more than 2 substances), only tobacco consumers, and any consumption obtained the higher mean scores. People who requested to live in Spain showed higher levels of psychological distress ( $t = 6987$ ;  $P = .049$ ). Furthermore, people who experienced isolation due to risk contact, people who needed medical assistance related to COVID-19, and those who reported having chronic illnesses, had higher levels of psychological distress ( $t = 1379.5$ ,  $P = .001$ ;  $t = 7.990$ ,  $P = .018$ ;  $t = 2686.5$ ,  $P = .02$ ; respectively) (Table 2). However, the correlation between GHQ-12 median score and age mean was not significant (Tau  $\beta = 0.17$ ,  $P = .61$ ).

Finally, those variables that had obtained significant differences in the hypothesis tests were introduced in the regression models. As shown in the regression analysis of Table 2, the substance abuse, isolation, medical assistance, chronic illness, and willing to return variables obtained  $P$  values  $< .05$  and presented statistically significant differences. Therefore, they were inserted in the regression analysis. Table 3 shows the results of the categorical regression. It is observed that the desire to return, isolation, and substance abuse variables are related to the presence of psychological distress in the unemployed migrant sample, and this model explains 48% of the variance of the variable.

## 4. Discussion

The data analyzed in this work constitute a sub-analysis of a previous study by the authors.<sup>[36]</sup> The results of the current study

**Table 1**

**Sociodemographic characteristics of the sample and GHQ-12 mean and median scores.**

Sex	Male	n = 266 (83.9%)	Total sample N = 317
	Female	n = 51 (16.1%)	
Age	Mean	33.4	
	Standard deviation	10.7	
Educational level	No studies/primary studies	n = 265 (83.6%)	
	Secondary studies	n = 42 (13.2%)	
	Higher studies	n = 10 (3.1%)	
Marital status	Single	n = 157 (49.5%)	
	Married	n = 131 (41.3%)	
	Separated/divorced	n = 7 (2.2%)	
	Engaged	n = 15 (4.7%)	
	Widowed	n = 7 (2.2%)	
Willing to return	No	n = 252 (79.5%)	
	Yes	n = 65 (20.5%)	
Work permit	No	n = 238 (74.8%)	
	Yes	n = 79 (25.2%)	
Chronic disease	No	n = 309 (97.5%)	
	Yes	n = 8 (2.5%)	
Covid-19 diagnosis	No	n = 308 (97.2%)	
	Yes	n = 9 (2.8%)	
Medical assistance	No	n = 312 (98.4%)	
	Yes	n = 5 (1.6%)	
Isolation	No	n = 296 (93.4%)	
	Yes	n = 21 (6.6%)	
Substance abuse	None	n = 201 (63.4%)	
	Alcohol	n = 22 (6.9%)	
	Tobacco	n = 51 (16.1%)	
	Alcohol/Tobacco and Hashish	n = 40 (12.6%)	
	Heroin	n = 1 (0.3%)	
	Polyconsumption	n = 2 (0.6%)	
GHQ-12 scale	Mean	13.69	Maximum score = 36 points
	Standard deviation	3.86	
	Median	13	
	Interquartile range	3	

specifically assess psychological distress in the same study population yet controlling for the employment variable. Therefore, our results indicate that unemployed migrants living in informal settlements in Huelva have developed high levels of psychological distress (mean GHQ-12 score: 13.69). Recent qualitative investigations in this informally settled population reported sadness and fear feelings related to housing, family, or bureaucracy in the general context of informal settlements in Huelva.<sup>[37]</sup> Our study added that psychological distress was potentially higher for those who had lived in isolation due to suspicion of contagion of COVID-19 than for those who had not, for those who wished to remain in Spain, and for those who had consumed more than 2 types of toxic substances. In this sense, similar levels of psychological distress measured with GHQ-12 were also reported in the employed<sup>[38]</sup> and unemployed<sup>[39]</sup> segments of the general Spanish population during the pandemic. Nevertheless, it should be noted that the population of this study was not of Spanish origin. Therefore, despite the data reflecting psychological distress in Spain, cultural considerations should also be addressed in subsequent studies on this topic. As stated in 2015, the negative evolution of health indicators among settled immigrants leads to a situation where the less socioeconomically advantaged groups experience the worst effects of a crisis, mainly unemployment and mental health deterioration.<sup>[40]</sup>

The profile of the majority of the sample is that of a man of about 33 years of age, uneducated, from Africa, with no intention of returning to his country of origin, without a work permit, who has not been diagnosed with COVID-19, has no chronic illnesses, and does not consume any substances. It is particularly striking that 84% of the sample was made up of

**Table 2**  
Significant contrast hypothesis results.

Scale	Variable	Variable values	Median	Interquartile range	Contrast hypothesis
GHQ-12	Substance abuse	None	13	3	0.049†
		Alcohol	14	6	
		Tobacco	14	3	
		Alcohol/Tobacco and Hashish	12	3	
		Heroin	12	3	
		Polyconsumption	28	5	
	Isolation	No	12	3	0.001*
		Yes	16	4	
	Medical assistance	No	13	3	0.018*
		Yes	17	8	
Chronic disease	No	13	3	0.02*	
	Yes	15	6		
Willing to return	No	14	3	0.049*	
	Yes	12	5		

\* Mann–Whitney *U* test.

†Kruskal–Wallis *H* test.

**Table 3**  
Regression model.

Scale	Variables	Beta coefficient	Variable significance ( <i>P</i> value)	<i>R</i> <sup>2</sup> value	Model significance ( <i>P</i> -value)
GHQ-12	Isolation	0.176	.02	0.48	.001*
	Willing to return	−0.173	.001		
	Chronic disease	0.077	.073		
	Medical assistance	0.064	.127		
	Substance abuse	−0.113	.005		

\*ANOVA.

young men, unlike the samples obtained in other studies carried out in similar contexts. In the case of the study by Muhula et al<sup>[41]</sup> carried out in Kenya, it can be seen that the profile of the majority of the sample is that of a woman between 35 and 54 years of age with no education or primary education and who works on a temporary basis. Similarly, in a study carried out in informal settlements in Peru,<sup>[42]</sup> the sample was almost equally composed of women and men (51.2% vs 48.8%, respectively), with a higher mean age (40.75 ± 7.49 years), and where 3 out of 4 were illiterate. In Spain, a study was carried out in a similar context (south-eastern part of Spain as opposed to the south-western part of the present study). In this study, the population reported a mean age of 33.29 years (SD: 9.11), 55.88% were men and 44.12% were women, with a mean length of residency in Spain of 5.09 years, and 35.29% of them did not work while 64.71% of them worked in greenhouses.<sup>[43]</sup> In this case, 2 similar realities coexist in southern Spain (from east to west).

Another point to note was that the participants who reported their willingness to stay in Spain presented a higher mean score compared to those who wished to return to their country of origin (14 vs 12, respectively). In this sense, in a study conducted on a sample of refugee migrants and non-refugee migrants with common mental disorders compared to Swedish-born subjects, it was observed that both refugee migrants and non-refugee migrants had a higher risk of long-term unemployment compared to Swedish-born participants. This indicates that immigrants had a higher risk of long-term unemployment than people from the country where the study was conducted.<sup>[44]</sup> In addition, the study by Sotomayor et al<sup>[42]</sup> that was conducted with disadvantaged communities in Peru revealed that unemployed people and even those who had managed to keep their jobs during the pandemic were predisposed to feel greater levels of fear of COVID-19, and the authors attribute this fact to the possible fear of contagion in the performance of their work duties. In line with the present study, is the study by Burton-Jeangros et al,<sup>[45]</sup>

where 71.4% of undocumented migrants reported symptoms related to anxiety or depression.

In line with other studies, a worsening of mental health conditions was found compared to pre-pandemic levels and to non-migrant populations.<sup>[27]</sup> As well as social determinants to which they were exposed, job loss could be another reason why substance use, especially tobacco use, was exacerbated. In a qualitative study conducted in south-eastern Spain, it was identified that irregular migrants were at a higher risk of exposure to COVID-19 psychological consequences due to their precarious living conditions, administrative situation, and limited access to the health care system.<sup>[43]</sup> Indeed, the barriers to accessing the health system could be the result of the coalition of cultural experiences, marginalization and system discrimination, hence cultural mediators can perform essential work during the health promoting interventions to diminish these inequities of the health system.<sup>[43,46]</sup> Living in informal settlements was also a determining factor in the development of psychological distress and has a strong influence on refugee safety.<sup>[47]</sup> Saab et al, in 2020,<sup>[48]</sup> analyzed the Lebanese population living in settlements and revealed high levels of psychological distress associated with the support by humanitarian organizations, resilience, and economic factors. Similarly, a study carried out in the world's largest refugee camp highlighted that poor socioeconomic conditions, previous traumatic experiences, uncertainty and poor access to health services were the factors that maintained the prevalence of anxiety and stress among the adult population.<sup>[49]</sup>

The implications of these findings highlight the importance of the cultural approach to the population that resides in informal settlements. The uptake of effective prevention measures could be hindered by cultural obstacles, such as low severity perception or COVID-19 denial and misconceptions about the disease, that may lead to a low level of threat (susceptibility and severity) and wrong beliefs about the efficacy of preventive behaviors.<sup>[50]</sup> Thus, the government administrations should implement culturally adapted public health policies with targeted interventions for migrants living

in informal settlements in order to mitigate socio-labor problems and advocating for relevant and comprehensive evidenced-based policies. In this sense, trusted and respected members of local communities are considered reliable resources for health management in both formal and informal settings.<sup>[51]</sup>

This study is not exempt from limitations. First, there is no official census of the study population, explained by the very nature of informal settlements, and this favored a non-probabilistic snowball sampling by convenience, carried out with the help of cultural mediators and informal leaders of these settlements. For this reason, it is important to point out a possible bias in the sharing of information, since participants' network connections through this sampling method can lead to homogeneity of responses and participants could have been influenced by the opinions or experiences of those who were recruited before. The lack of a randomization process could imply that the participants share similar characteristics, which could lead to a lack of representativeness of the population with respect to other informal settlements that exist in Spain, and even, in other settlements worldwide. However, with the help of key informants in each settlement, who usually collaborate with the different NGOs in the field, efforts have been made to obtain data from a sample as large as possible, in order to present representative statistics. In this sense, by increasing the statistical power of the obtained data, a sample which was larger than the minimum recommended was collected. Likewise, as this was a descriptive cross-sectional study, the findings should be confirmed with other follow-up studies since they do not allow establishing causal relationships between variables. At the same time, the possible significant differences between men and women have not been studied, since 83.9% of the sample were men; therefore, the study of the effect of the sex variable on the rest of the variables should be addressed in new studies with a more equal sample between men and women. Third, it is possible that not all variables that can affect psychological distress have been considered and aspects such as personality traits, coping strategies, sense of coherence, or resilience have not been evaluated. Similarly, since this was a self-reported study, the data provided by the participants are assumed to be valid. However, response bias should be considered. Finally, although the data collection tool was translated into French and Arabic, it is possible that some subjects may speak dialects specific to their country of origin that differ from the standard translation executed. In these situations, the role of cultural mediators and informal leaders was essential for a correct communication.

## 5. Conclusion

The median score of psychological distress in unemployed migrants living in informal settlements in Huelva indicated general high levels of psychological distress (GHQ-12 = 13). Among the subjects, participants who had experienced isolation due to contact with COVID-19, consumed substances, and had chronic illnesses reported the highest levels of psychological distress.

The results would identify employment, either formal or informal without a contract, as a possible mediating variable of psychological distress in migrants residing in informal settlements of Huelva during the COVID-19 pandemic. This issue deserves reflection on the part of public institutions as it is possible to assume that, by modifying this employment variable, e.g. through education and training strategies, the levels of mental health among this population could improve. Reasons for this hypothesis may lie in the fact that the perception of receiving financial retribution has an impact on self-perception and self-concept, and this may be closely related to the willingness to improve health-illness processes.

This investigation highlights the importance of the cultural approach to the population that resides in informal settlements. Cultural nuances may influence the perception and expression

of psychological distress among migrants in different contexts, therefore, the importance of mediators and investigators' cultural competency in dealing with diverse populations is acknowledged. Principally, this study emphasizes the importance of using specific strategies to ensure cultural sensitivity in the study design and data interpretation.

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