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Psicose e Urbanidade: Qual a Relação? Um Estudo Comparativo entre uma Área Urbana e uma Rural em Portugal

Urbanicity and Psychosis: Is there a Connection? A Comparative Study between an Urban and Rural Area in Portugal

JOÃO SAMPAIO LOPES^{1*}, ANA AFONSO QUINTÃO², CATARINA MELO SANTOS², MARIA DE FÁTIMA URZAL², INÊS DONAS-BOTO³

1. Departamento de Psiquiatria e Saúde Mental do Hospital do Espírito Santo de Évora, Évora, Portugal

2. Serviço de Psiquiatria de Adultos do Centro Hospitalar Lisboa Ocidental (Hospital Egas Moniz), Lisboa, Portugal

3. Instituto Português de Oncologia de Lisboa, Lisboa, Portugal

Resumo

Introdução: Os estudos sobre urbanidade e psicose apresentam resultados contraditórios. Nos países do Norte da Europa e China existe uma relação positiva; nos países do sul da Europa e países subdesenvolvidos não se encontraram diferenças significativas entre as taxas rurais e urbanas de psicose.

Métodos: Realizamos um estudo retrospectivo observacional, com os doentes admitidos em duas unidades de internamento por primeiro episódio psicótico (PEP) durante 5 anos, numa área rural (Évora) e numa área urbana (Lisboa). Excluimos psicoses afetivas ou orgânicas. Extraímos e analisamos estatisticamente dados sociodemográficos e clínicos.

Resultados: A prevalência de PEP foi igual para ambas as áreas (42/100 000 habitantes), com predomínio de indivíduos desempregados (63%) e sem relacionamento afetivo (81% em Évora *versus* 72% em Lisboa). A média de idades foi semelhante (43,4 anos *vs* 41,4 anos). Lisboa apresentou maior diversidade de nacionalidade (16,3% *vs* 4,6%) e maior taxa de perturbação psicótica devido ao uso de substâncias (26,5% *vs* 21,6%). O diagnóstico mais prevalente em Lisboa foi perturbação psicótica não especificada (PPNE) (34,7%), enquanto em Évora foram perturbação delirante (PD) (21,5%) e perturbação psicótica aguda e transitória (21,5%). A PD foi um diagnóstico prevalente em ambas as áreas, afetando sobretudo mulheres e com idade média superior. A duração da psicose não tratada (DPNT) inferior a 1 mês foi maior em Lisboa (24,5% *vs* 4,5%), mas houve uma elevada prevalência de DPNT superior a 2 anos em ambas as amostras (20,4% *vs* 23,1%).

Discussão: A idade média de PEP foi superior do que em outros estudos, o que pode traduzir uma prevalência significativa de PD ou refletir uma DPNT mais elevada. Uma reduzida DPNT inferior a 1 mês na área rural pode ser explicada por maior isolamento da população, menor literacia em saúde ou maior integração dos doentes na comunidade. A prevalência de PPNE foi maior na área urbana, possivelmente por diferentes formas de registos ou uma menor DPNT.

Conclusão: Os resultados estão em linha com estudos reportados em países do sul da Europa, onde não foi encontrada associação entre psicose e urbanidade, sendo necessários mais estudos para elucidar esta questão.

ABSTRACT

Introduction: Studies about urbanicity and psychosis show contradictory results. In northern European countries and China there is a positive relationship; in southern European and underdeveloped countries, a significant difference between rural and urban rates of psychosis has not been found.

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* Autor Correspondente/Corresponding Author: João Sampaio Lopes | jqlopes@hevora.min-saude.pt | Largo do Senhor da Pobreza, 7000-811 Évora

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Methods: We carried out a 5-year retrospective observational study, with patients admitted to two inpatient units for first-episode psychosis (FEP), in a rural area (Évora) and an urban area (Lisbon). We excluded affective or organic psychosis. Socio-demographic and clinical data were extracted and analyzed.

Results: The prevalence of FEP was the same for both areas (42/100 000 inhabitants), with a predominance of unemployed (63%) and lonesome individuals (81% in Évora versus 72% in Lisbon). The mean age was similar (Évora 43.4 years old; Lisbon 41.4 years old). Lisbon had a greater diversity of nationalities (16.3% vs 4.6%) and a higher rate of psychotic disturbance due to substance use (26.5% vs 21.6%). The most prevalent diagnosis in the Lisbon was unspecified psychotic disorder (UPD) (34.7%), while in Évora it was delusional disorder (DD) (21.5%) and acute and transient psychotic disorder (21.5%). DD was a prevalent diagnosis in both areas, affecting mainly women and those with a higher median age. Duration of untreated psychosis (DUP) of less than 1 month was higher in Lisbon (24.5% vs 4.5%), but there was a high prevalence of DUP of more than 2 years in both samples (20.4% vs 23.1%).

Discussion: The mean age of FEP was higher than in other studies, which may translate a significant prevalence of DD or reflect a higher DUP. A reduced DUP of less than 1 month in the rural area can be explained by greater isolation of the population, lower health literacy or better integration of patients in the community. The prevalence of UPD was higher in the urban area, possibly due to different forms of registration or a lower DUP.

Conclusion: Our results are in line with studies reported in southern European countries, where no association was found between psychosis and urbanicity, and further studies are needed to elucidate this issue.

Palavras-Chave: Perturbações Psicóticas; População Rural; População Urbana

Keywords: Psychotic Disorders; Rural Population; Urban Population

INTRODUCTION

The etiological factors responsible for psychosis are not yet fully elucidated; along with genetic factors, environmental factors are thought to play an important role, and have extensively been studied for schizophrenia, involving obstetric and perinatal complications; drug consumption, especially cannabis; urbanicity; and migration.¹ Childhood trauma, bullying, social exclusion, and discrimination during adolescence and adulthood have also been pinpointed as possibly increasing the risk of developing a psychotic disorder; these could also explain elevated psychosis risk in vulnerable groups such as migrants or people of a visible minority status.²

Given the migratory flow seen in recent decades, with a tendency to increase, being estimated that already more than 50% of the world's population resides in cities, the understanding of the factors that contribute to the onset of psychosis becomes therefore an important topic.

Current data points to a link between psychosis and urbanicity (urban birth or moving towards urbanicity before age 10),³ mainly observed since the first half of the 20th century, although the results have not always been replicated.^{4,5} This link is still under research; so far, the majority of studies failed to explain how specific factors of urban environment combine to create protective or disruptive environments. The general term "urban stress", still poorly defined, has been used to describe most of these phenomena.⁶

European studies by country show an interesting trend, with some northern countries (United Kingdom and Netherlands,⁷ Sweden⁸) reporting higher risk for psychosis in urban settings, while southern countries (Spain, France, Italy) did not find an association. Likewise, a multicentre European study found no association between urbanicity and increased risk for psychosis.⁷

Worldwide, China has reported an association between psychosis and urbanicity (as previously stated, urban birth; also, living 10 years or more in an urban environment).^{9,10} An international study aimed at low and middle-income countries showed no association between urban living and self-reported psychotic disorders, although the results were heterogeneous; some countries, such as Mali, Senegal and the Philippines, even reported a lower risk of psychosis in urban areas.¹¹

Symptom expression also had a variation across countries, with urbanicity correlated to more positive and negative symptoms in the UK, but less symptoms in Spain.⁷

Another example showcasing conflicting evidence regards hospitalization rates for schizophrenia, which were lower in towns with more than 10 000 residents in the island of Sardinia, Italy.¹²

The mechanisms through which urbanicity increases the risk for psychosis are not yet fully understood.

Some possible explanations have been drawn on the basis of a higher psychosis incidence in migrant groups, which are more prevalent in urban areas.^{4,13-15}

In an umbrella review of risk factors for psychosis, grading the associations between each factor and a diagnosis of non-organic psychotic disorder (convincing, highly suggestive, suggestive, weak, non-significant), there was only convincing evidence of association in ultra-high-risk state for psychosis and Black-Caribbean ethnicity in England. However, several factors were highly suggestive (ethnic minority in low ethnic density area, second generation immigrants) and suggestive (urbanicity, ethnic minority in high ethnic density area, first generation immigrants, North-African immigrants in Europe) of association.¹⁶

Another investigation tried to differentiate the weight of various factors. Economic deprivation, social isolation and

urbanicity emerged as independent risk factors when ethnicity was accounted for.¹⁷

The very assumption of psychosis being higher in migrant groups or ethnic minorities remains somewhat controversial; for example, UK studies point towards discrimination and social deprivation as causal factors, whereas USA studies take into account an elevated rate of misdiagnosis in the African American population.¹⁸

In yet another study, higher psychosis risk was not associated with urbanicity *per se*: when factors such as ethnic minority status, owner occupancy of housing, household status (single person) and unemployment were accounted for, psychosis risk was not significantly associated with urbanicity.^{5,19} Several studies show that within cities, first episode psychosis (FEP) incidence is higher in more deprived areas, with higher social fragmentation and lower social capital.^{20,21} A study testing the association between the incidence of schizophrenia and social capital (that encompasses community networks, civic engagement, sense of belonging, solidarity, equality, cooperation, trust) pinpoints to a gauss curve, in which both the neighbourhoods with lower and higher social capital have a higher incidence of schizophrenia (independent of age, sex, ethnicity, ethnic density, ethnic fragmentation and socio-economic deprivation). Incidence in the former would be explained by higher social stress, whereas explanations for the latter are based on 2 different hypotheses: social exclusion of the people who are considered outsiders, and greater informal social control (psychotic individuals in these communities with increased likelihood of coming to the attention of mental health services).²²

While it has been proposed that urbanicity might have a bigger effect on psychosis on those genetically predisposed to it, it has also been argued that those most vulnerable to psychosis are also more compelled towards city living.²³ On the other hand, urban living can have advantages in health access and resources, which can mean earlier access and better treatment; for instance, a study showed that patients in rural areas were less likely to take antipsychotics (35.4 vs 17.5%).²⁴ Nevertheless, some studies showed that urban patients did not access care earlier than rural ones, even though they had significantly higher income and access to health services,^{19,20} as well as higher average levels of education (5.3 vs 8.11 years in India and 45% vs 67% of university frequency in Australia). Others showed the opposite trend, advocating that resident of rural areas had fewer access to care.^{25,26}

It has also been debated that exposure to green spaces reduces risk of psychosis (whether by itself or as a proxy for urban stress, pollution and toxin exposure),¹⁹ thus making rural areas less prone to it. The concept also applies within cities, with those living in less green neighbourhoods showing higher rates of psychosis. This can, to an extent, be linked to socio-economic factors (richer neighbourhoods possessing more green spaces).²⁷ Lack of green space exposure and risk of psychosis seem to be more relevant during childhood.⁷

There has also been research relating urban upbringing with reduction in grey matter volume; interestingly, this association was only true for males.²⁸

Given these findings, it seems important to clarify this issue in order to identify possible leading mechanisms and eventually develop preventive strategies.

Therefore, we aimed to study the clinical and sociodemographic differences in two contrasting catchment areas. In order to do that, we analysed all first psychotic episode admissions in a 5 year period in 2 Portuguese hospitals, one in a more urban area and another in a more rural one.

METHODS

a. General overview

The concept of urbanicity is difficult to define, and mainly referred to as the quality of being urban. Population density is often used as a proxy. Rural areas are usually classified by exclusion (the areas that do not meet the criteria for urban areas).²⁹ The European Commission defines an Urban Center as having a minimum of 50 000 inhabitants plus a population density of at least 1500 people per square kilometre or density of build-up area greater than 50%; an Urban cluster as having a minimum of 5000 inhabitants plus a population density of at least 300 people per square kilometre; and a Rural setting as having fewer than 5000 inhabitants.³⁰

b. Study areas

The rural area (Évora), with a Hospital that serves a whole district, is an interior district located in the south of Portugal, with an approximate population of 153 000 inhabitants.²⁵ It covers an area of 7393 km², making it the second largest district in terms of area in the country, with a population density of 21 inhabitants/km² (ranging from 7 in the lower density areas to 41 inhabitants in Évora). The local economy is now more diversified, with the strengthening of the industrial and service sectors, but it still has a strong agricultural component. The mental health services include an inpatient service, with 16 beds, located at the Hospital do Espírito Santo in the district capital, with outsourced consultations in the district's municipalities and a community team that brings mental health care to more distant areas.

In the urban area (Lisbon), Hospital Egas Moniz comprises, together with two other hospitals, the Hospital Center which serves the Western part of Lisbon (Portugal's capital) and the municipality of Oeiras, and encompasses a population of 231 738 inhabitants,²⁵ covering a small, but densely populated area (Lisbon with 5475 inhabitants/km², Oeiras with 3745 inhabitants/km²). The local economy relies on industry and services. The mental health services include an inpatient service, located at Hospital Egas Moniz, with 25 beds; three community-allocated teams; a Day Hospital; and other smaller services, such as liaison, forensics, and perinatal psychiatry.

c. Study design

We conducted a retrospective observational study including all patients, in both areas, of cases admitted to the inpatient service of the respective hospital, in which the first psychotic episode was identified, during a 5 year period. The existence

of psychotic symptoms as described in the DSM 5²⁶ (hallucinations, delusions or disorganization of thought or behaviour) was considered and the sample was evaluated in general and according to the differential diagnosis at discharge within non-affective psychoses, since our objective was to study psychosis as a primary phenomenon, that is, only primary psychosis disorders, and not psychotic symptoms as secondary to other symptoms. Hence, all hypothetical cases within the group diagnosis of “schizophrenia spectrum and other psychotic disorders” (delusional disorder, brief psychotic disorder, schizophreniform disorder, schizoaffective disorder, substance/medication induced psychotic disorder, psychotic disorder due to another medical condition, other specified schizophrenia spectrum and other psychotic disorders, unspecified psychotic disorder) were reviewed and sociodemographic data, clinical characteristics and information about the context of hospitalization (date, sex, age at admission, length of hospitalization, compulsory hospitalizations, primary diagnosis at discharge, employment status, relationship status, nationality, substance use, duration of untreated psychosis) were collected. All information collected were extracted anonymously and destroyed after being processed.

In both areas, potential participants with FEP were included if they met the following criteria: presenting with a clinical diagnosis of FEP, even if longstanding untreated disease, resident within the catchment area at first presentation, with 18 years old and above. Cases were excluded if they were not resident in the catchment area, had presented previously with a psychotic episode, had a diagnosis at discharge of affective psychosis, or had a clear organic cause for their symptoms. Formal methods of calculating the DUP, i.e., through the use of semi-structured interviews, is regularly used in a research context, with highly trained teams. This method is not usually used on a daily basis in clinical settings. In this sense, and based on the methodology, the calculated DUP was obtained through the clinical records and the information contained therein.

d. General population data

Data for the general populations stratified by age and gender were obtained in Instituto Nacional de Estatística – Census 2021.

e. Statistical analysis

In this initial assessment, we chose to compare the socio-demographic variables of each catchment area. Descriptive statistics of the results obtained were performed. Statistical tests were performed with a 95% confidence interval to calculate differences between subgroups. A p value <0.05 was considered statistically significant.

RESULTS

In Évora, 65 cases of FEP were identified during the 5-year period covered by the study. This value corresponds to a prevalence of 42/100 000 inhabitants. The average age of the subjects is 43.4 years and 52.3% are women ($p=0.6805$). In Lisbon, 98 cases of FEP were identified during the 5-year period covered by the study. This value corresponds

to a prevalence of 42/100 000 inhabitants. The average age of the subjects is 41.4 years and 59.1% are men.

There was also a greater diversity in nationality in the urban area, with 16.3% of the patients being of a non-Portuguese nationality, versus 4.6% in the rural area.

There was a predominance of individuals who are unemployed, with similar representation in both areas: 63.1% in Évora vs 63.3% in Lisbon ($p=0.6328$)

It should also be noted that the vast majority of individuals did not have an affective relationship, being single (49% in Lisbon, 50% in Évora), divorced (19% vs 21%) or widowed (4% vs 9%), at the time of the first contact with the services. Median age of FEP on admission at the inpatient unit is 41.61 years in the urban catchment and 43.4 in the rural catchment ($p=0.5483$). The younger age groups represent the majority of cases, with subjects between 18 and 40 years corresponding to 53.8% in Évora and 53% in Lisbon. In terms of diagnosis, unspecified psychotic disorder was the most prevalent diagnosis in Lisbon (34.7%), representing 16.9% of the cases in Évora ($p=0.1405$). The most prevalent diagnosis in Évora were delusional disorder (21.5%) and acute transient and psychotic disorders (21.5%).

As stated above, acute and transient psychotic disorder was more prevalent in Évora, representing 21.5%, vs 7.1% of the cases in Lisbon, as well as schizophrenia (18.5% in Évora vs 13.3% in Lisbon).

On the other hand, psychotic disorder due to the use of (any) substance was more prevalent in Lisbon (26.5%) than in Évora (21.6%), with THC being the most significant substance identified, comprising more than 90% of cases in Lisbon and more than 70% of cases in Évora.

In both areas, delusional disorder is a highly prevalent diagnosis, being more so in Évora (21.5%) than in Lisbon (18.4%). In regard to this diagnosis, it is interesting to note a representation of women in relation to men (72% in Lisbon and 93% in Évora) and an average age much higher than the average age of the general sample (57.4 years in Lisbon and 63.3 in Évora)

Another aspect of notice, in which these samples differ, is the number of individuals who presented with FEP with duration of untreated psychosis (DUP) <1 month. In Évora they represent 4.5% while in Lisbon 24.5% ($p<0.05$) There was, nonetheless, a high prevalence of DUP >2 years on both samples: 20.4% in Lisbon vs 23.1% in Évora.

DISCUSSION

Migrations, a fundamental and timeless feature of Humanity, tending from less populated areas to more densely populated ones, have been increasing. Population agglomeration brings new challenges and demands, in a world in constant and ever faster change, so the influence of urbanicity on mental health has been a topic of greater interest in the scientific community.¹⁹

To our knowledge, this is the first study in Portugal to try to elucidate how the environment (rural, urban) influences the emergence of FEP.

The mechanisms through which urbanicity increases the risk for psychosis are not yet fully understood. Some

possible explanations have been drawn on the basis of a higher psychosis incidence in migrant groups, which are more prevalent in urban areas, but great attention has been paid to the influence that specific socioeconomic challenges have in this particular setting.

Although the majority of cases represent younger age groups, the median age of FEP onset is higher than in other studies, where it stands on the second or third decade.^{31,32} The results were not expected, as there is a general consensus that most cases of mental disorder begin early in life. One study estimated that 75% of cases began by age 24³³; a more recent meta-analysis estimated that the proportion of individuals with onset of any mental disorder before age 25 was 62.5%.³⁴

These data might correlate to a significant prevalence of delusional disorder in our samples, as stated earlier. Studies are not conclusive about the prevalence of delusional disorder, as it is a rare entity; some literature shows the prevalence of delusional disorder in a clinical population to be approximately 0.5% – 1% of all admissions (with older investigations reporting up to 4%).³⁵ Studies in the last decade also pinpoint to a prevalence of 0.5% of all psychiatric admissions.³⁶ The lifetime prevalence is estimated at around 0.2%³⁷ and the 12-month-prevalence at 0.02%.³⁸ In our study, which focused only on the first psychotic episode admission during a 5-year period, the number of admissions in the urban area for delusional disorder was 1.1% (18 patients in 1578 admissions) and 1.43% in Evora, which is slightly higher than the admissions reported on other studies. However, if we include all admissions for delusional disorder, and not just first episodes, for that 5-year period, in order to compare it to other studies, it represents 4.1% of all admissions in the urban area (65 admissions in a total of 1578 admissions), and 6% in Evora.

Alternatively, it might reflect a general higher DUP than other countries, which begs reflection of the detection systems put in place by the Portuguese healthcare system, which might not be sufficient. Ideally, the first point of contact for mental health care should be attained by referral from a family doctor; studies have shown that emergency department visits as a first point of contact may reflect poor access to timely outpatient mental health care, a condition that is cited to be more frequent in migrants.³⁹ In Portugal, data from 2021 show that more than 1.1 million people do not have a family doctor, corresponding to more than 10% of the population⁴⁰; this proportion is far greater in the region of Lisbon, corresponding to 68.8% of the cases. Furthermore, despite the National Plan for Mental Health advocating for a strong articulation between mental health services and primary health centres, the most recent report states various difficulties in that articulation, without a formal articulation model,^{41,42} which makes it reasonable to suggest that there is still insufficient training and supervision being provided to family doctors. This could mean that some patients suffering from psychosis might not be timely recognized and referred to mental health services. These data could partially explain the long DUP and the higher median age of FEP at admission, admitting that in at least some cases, there was a high DUP due to non-recognition

or non-referral, meaning that the first contact of some patients with the mental health services occurs many years after the start of psychotic symptoms.

Another aspect that should be taken into consideration concerns the lack of formal and informal education as well as mental disease related stigma which translates in the lack of recognition and action at community level. Accordingly, it is likely that many individuals with mental illness go undetected, which in part may explain why DUP is longer.^{43,44} As shown in the results, there is a preponderance of subjects, especially women, in whom untreated delusional disorder with several years of evolution was recognized, which influenced the DUP and the median age of first contact with the mental health services.

In the rural area, the prevalence of DUP < 1 month (4.5%) was much smaller than in the urban area (24.5%), which could be explained by a number of factors. Taking into account the geographical differences, people living in more isolated areas tend to have greater difficulty in accessing health services^{25,26} and might come into contact with fewer people, diminishing the chances of someone realizing they are ill and encouraging them to seek help or reporting the situation. However, as mentioned previously, some studies show that urban patients did not access care earlier despite better access to health services, higher income and level of education.⁴⁵

Another possible explanation is related to the integration in the community and its demands; in a rural area, where there are more opportunities for some types of work, namely agricultural, it will be easier for people with psychotic disorders to find and maintain employment.^{46,47}

This has also been linked with the hypothesis that schizophrenia fares a better outcome in the developing, rather than the developed, countries.⁴⁸ Being more integrated in the community, and able to find and maintain employment, means that some symptoms might be better tolerated by others and/or render it less likely that others might recognise illness and encourage help-seeking.

Another possible explanation relates to literacy, which has a correlation with health literacy, and this in turn with help-seeking behaviour which tends to be higher in urban areas,^{49,50} and this is also true for the urban catchment presented here, with 24.6% of the population with no education or basic education, vs 37.8% in the rural area.⁵¹

The DUP prevalence also correlates to other variables. For instance, the prevalence of unspecified psychotic disorder was higher in the urban catchment area, which can be explained by different forms of recording, but also linked to a shorter DUP, which means that a formal diagnosis of Schizophrenia according to the DSM-5 might not be possible on the first psychotic episode.³⁷

Another important issue is related to the fact that in any study it is only possible to report data referring to individuals who, with more or less time of untreated illness, actually present themselves in the services, being only possible, strictly speaking, to refer the incidence of treated people. This aspect, allied to the duration of untreated psychosis, pointed out again as a relevant factor, deserves to be highlighted here, to emphasize the way these individuals establish contact with mental health services. Therefore, it

is worth reflecting on which detection and referral mechanisms exist in our country so that, in an early and effective way, the timely assessment of these individuals is possible. It can be argued that at this moment these resources may be deficient in Portugal, which may cause constraints in the detection and treatment of these individuals.

Our primary question, which was whether there was a relationship between urbanicity and psychosis, found no differences whatsoever, with both catchments having the same prevalence, of 42/100 000 inhabitants. These results mirror those found in other southern European countries, such as Spain and Italy.

LIMITATIONS

There are some limitations to our study. First, the recording of diagnosis, which was made on an individual basis by psychiatrists on each Hospital, meaning that there might be differences due to some subjective parameters, such as the use of different diagnostic manuals⁵²; the fact that some clinicians are more assertive and others more cautious when assigning diagnostics; the recording of a diagnosis only on a syndromic level, and not a nosologic one; the recording of diagnosis based only on clinical interviews and not a standardised diagnostic interview, such as a semi-structured interview, thus diminishing the scientific rigor, as there may be significant interrater reliability, particularly in some diagnosis⁵²; the review of clinical files, which does not represent the ideal means of making a diagnosis; and the DUP.

The prevalences that we found also hold significant limitations. They only apply to patients with a FEP who required

hospitalisation, and not those who were observed by a family doctor, in the psychiatry emergency department, or in a psychiatric consultation. They also only apply to those who were hospitalised in the national health system, and not the ones who might have been hospitalised in the private or social sector.

CONCLUSION

We found in our study that, in line with current available data, weak social and affective support^{53,54} and difficulty in keeping a job are often present.⁵⁵ There was a higher age at first contact with mental health services than other studies, where the diagnosis of delusional disorder stands out, which for many years went untreated and which delayed the age of diagnosis. In this work we also hypothesize which factors may contribute to the delay in the diagnosis and treatment of unrecognized psychotic individuals, focusing on issues both at institutional and community level and how the reinforcement of cooperation in the first example and the commitment to education in the second, can contribute to a better identification of these cases.

In our study, the results are in line with those observed in southern Europe, the clear association with urbanicity being elusive. It is still a challenge to define what can be considered an urban environment and what aspects of organization and social interaction influence the dynamic experience of this concept and lead to the possible effect of urban stress. There is a need for more studies to elucidate this problem, so that better policies and preventive strategies can be put in place.

Responsabilidades Éticas

Conflitos de Interesse: Os autores declaram a inexistência de conflitos de interesse na realização do presente trabalho.

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