

Original article

Transition to psychosis during the COVID-19 pandemic: a real-world study of conversion rates in individuals with attenuated psychotic symptoms

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SUMMARY

Objective

The COVID-19 pandemic caused widespread disruptions, affecting healthcare systems, social dynamics, and mental well-being. However, its impact on psychosis remains a subject. This study examines psychosis transition rates and associated psychopathology among individuals at clinical high-risk for psychosis (CHR-P) with attenuated psychotic symptoms (APS) during the COVID-19 pandemic in Italy.

Methods

This retrospective study analyzed 12-month longitudinal data from 27 individuals with APS enrolled from April 2020 to April 2021. The participants' age was 22.18 ± 3.58 years; fourteen were females; eight reported cannabis use; fourteen resided in urban areas; none had prior or current antipsychotic treatment. The transition to psychosis was assessed using the Structured Interview for Psychosis-Risk Syndromes (SIPS/SOPS) criteria. The Aberrant Salience Inventory (ASI) was administered at baseline to assess abnormal salience processing.

Results

After one year, eight subjects (29.63%) transitioned to psychosis. Sociodemographic characteristics and known risk factors of the transition to psychosis, such as cannabis use and urbanicity, did not significantly differ between those who transitioned (Converters) and those who did not (Non-Converters). Baseline ASI scores were significantly higher in Converters. Linear Mixed Model analysis revealed a worsening of symptoms over time in Converters.

Conclusions

This study evaluated the conversion rate to full-blown psychosis during the COVID-19 pandemic in an Italian cohort of CHR-P, revealing, after one year, a higher psychosis transition rate compared to pre-pandemic levels (approximately 30% vs. 15%). These findings highlight the need for further research into the impact of the COVID-19 pandemic on psychosis and the mechanisms underlying these transitions.

Key words: conversion to psychosis, clinical high-risk for psychosis (CHR-P), COVID-19, pandemic, aberrant salience

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Introduction

Research over the past two decades has operationalized psychosis proneness, enabling the prospective identification of individuals with clinical high-risk for developing psychotic disorders (CHR-P)^{1,2}. The psychosis prodromal phase has been widely studied as the crucial period for early detection and intervention, leading to the integration of preventive strategies into clinical practice³.

Currently, two complementary approaches are used to characterize the CHR-P state ⁴: the Ultra-High-Risk (UHR) criteria and the Basic Symptoms criteria. UHR requires the presence of one or more of the following: attenuated psychotic symptoms (APS), brief limited intermittent psychotic symptoms (BLIPS), and/or genetic risk and deterioration (GRD) criteria ^{5,6}. Meta-analytical evidence highlights that APS accounts for most of the UHR group (approximately 85%) ⁷. Indeed, positive symptoms, such as unusual thought content, suspiciousness, and perceptual abnormalities, are now recognized to exist on a continuum of clinical severity. Moreover, positive symptomatology serves as a key marker for determining whether an individual has crossed the threshold from CHR-P to a fully developed psychotic disorder, a process commonly referred to as “conversion” or “transition” to psychosis ⁸. Approximately 15% of CHR-P convert to a psychotic disorder within one year, with this rate rising to 35% over 10 years ⁹. These conversion rates are significantly higher than the general population (0.5 in three years) and other clinical populations (3.9% in three years) ^{10,11}. Among those CHR-P who do not convert to psychosis, around 48% achieve full symptom remission within a year ¹², while the rest continue to experience persistent or worsening APS and functional impairments ^{13,14}.

Despite consistent findings in conversion rates, substantial heterogeneity exists in the clinical, neurocognitive, and neurobiological presentation of CHR-P, as well as in their trajectories and outcomes. Assessing individual risk remains a significant challenge in psychiatry, given its critical implications for public health.

The COVID-19 pandemic caused a significant global disruption, affecting nearly every aspect of human life. From healthcare systems and economies to social dynamics and individual well-being, the effects of the pandemic have been far-reaching and profound. The restrictive measures, social isolation, and fears surrounding the virus and economic uncertainties have disrupted daily routines, limited social interactions, and increased stress levels, contributing to widespread psychological distress ¹⁵⁻¹⁷. Studies reported an increase in depression ¹⁸, eating disorders ¹⁹, and anxiety ^{18, 20}, as well as a rise in help-seeking behaviors among university students ²¹. However, the impact of the pandemic on other conditions, such as psychosis, remains controversial ²²⁻²⁵. The pandemic may have influenced the rates of transition to psychosis, but conflicting findings in this regard have been recently highlighted ²⁴⁻²⁷.

This study aims to examine the transition rates to full-blown psychosis and explore the associated psychopathological characteristics in a cohort of CHR-P with APS during the COVID-19 pandemic period in Italy.

Materials and methods

We conducted a retrospective study in 27 CHR-P with APS enrolled at the Policlinico Tor Vergata in Rome between April 2020 and April 2021, encompassing the first two waves of the COVID-19 pandemic in Italy, and prospectively reassessed 12 months later to examine the conversion rates to psychosis.

The inclusion criteria require the presence of an APS condition, defined by the Scale of Psychosis Risk Syndrome (SOPS): a score of 3–5 on at least one positive symptom item (P1-P5; Positive Symptoms), with a frequency of occurring at least once per week. The SOPS is embedded within the Structured Interview for Psychosis-Risk Syndromes (SIPS), a semi-structured interview tool specifically designed to identify CHR-P ⁶. The CHR-P condition is formulated if the subject meets the criteria for at least one of the three psychosis-risk syndromes: APS, BLIPS, and GRD. The SIPS/SOPS also includes three more scales for Negative, Disorganizing, and General Symptoms. These evaluate the presence and severity of negative, disorganized, and general symptoms such as sleep disturbances, dysphoric mood, motor disturbances, and impaired tolerance to everyday stress. These factors, while not included in the diagnostic criteria, appear to be strong predictors of the risk of transition to psychosis and will offer a descriptive and quantitative assessment of the diversity and severity of psychosis-risk symptoms ^{28, 29}.

Transition to psychosis was assessed using the SIPS/SOPS criteria, defined as the presence of at least one P1-P5 symptom at a psychotic level of severity (rated “6”) that has been occurring for at least one hour per day, with an average frequency of at least four days per week for one month, or that is severely disruptive or dangerous ⁶. Assessments were conducted by trained psychiatrists experienced in using the SIPS, ensuring consistency and reliability in evaluating APS and identifying potential transitions to full-blown psychosis.

All subjects enrolled in the study also met the criteria for Attenuated Psychosis Syndrome as introduced in the Diagnostic and Statistical Manual of Mental Disorders-Fifth (DSM-5) - Research Appendix section III ^{30, 31}.

The adopted exclusion criteria were: age over 30 years old; intelligence quotient equal to or less than 70, established by the Wechsler Adult Intelligence Scale-Revised (WAIS-R) ³²; concurrent presence of relevant neurological comorbidities (e.g., epilepsy, concussion, or traumatic brain injury); comorbid neurodevelopmental disorder (e.g., autism spectrum disorder, ASD); current substance use disorder; past or undergoing use of antipsychotic treatment.

None of the subjects recruited were hospitalized due to COVID-19 or experienced a clinically relevant infection. The Aberrant Salience Inventory (ASI) ^{33, 34} was adminis-

tered. The ASI is a self-report tool designed to measure aberrant salience, the unusual or incorrect attribution of significance to innocuous stimuli. It consists of 29 yes/no items organized in five subscales encompassing different dimensions of the aberrant salience construct: “Feelings of increased significance”, “Sharpening of senses”, “Impending understanding”, “Heightened emotionality”, and “Heightened cognition”³⁴. Research has consistently shown higher ASI scores in psychotic and high-risk subjects compared to healthy controls³⁵. At enrollment (T0), baseline assessments were conducted using the aforementioned instruments. At the follow-up of 12 months (T1), SIPS/SOPS was used to track changes in symptomatology and assess potential transitions to psychosis.

Statistical analysis

Data were reported as means and standard deviations (SDs) for continuous variables and counts and percentages for categorical variables. Univariate analyses were performed using non-parametric tests. For the Mann-Whitney test, the rank-biserial correlation represents the effect size. This metric quantifies the strength and direction of the relationship between the Converters and Non-Converters groups, reflecting the degree of difference in their ASI score ranks. A Linear Mixed Model (LMM) analysis was also conducted to assess the effect of “Time” (T0 vs. T1), “Conversion to psychosis” (Con-

verters vs. Non-Converters), “Time” × “Conversion to psychosis at T1” interaction on SOPS scores. Other variables, including gender, age, years of education, cannabis use, and urbanicity, were included as fixed effect factors, while “Subject’s code” was included as a random effect. A pairwise comparison was conducted to determine specific differences between groups. Based on the estimated marginal means of LMMs, Scheffé’s method was carried out in the pairwise comparisons to adjust the significance levels for the multiple comparisons. All the analyses were performed using R version 4.3.1³⁶. The statistical significance was set at $p < 0.05$.

Results

Twenty-seven subjects (14 females, 51.85%; age: mean, 22.18 years; SD, 3.58) who fulfilled the SOPS criteria for APS were enrolled in this study. Participants had an average education level of 13.22 years (SD 3.22). Eight (29.63%) subjects reported cannabis use, and fourteen (51.85%) subjects resided in urban areas. Additionally, six (22.2%) individuals were undergoing pharmacological treatment with antidepressants, benzodiazepines, or Z-drug at the time of the first evaluation. General practitioners prescribed antidepressants, including Selective Serotonin Reuptake Inhibitors (SSRIs), and benzodiazepines before enrollment. None of the subjects fulfilled the criteria for a diagnosis of a major depressive episode.

All subjects completed the one-year follow-up. After 12

TABLE I. Descriptive and univariate statistics of sociodemographic characteristics in the Converters vs. Non-Converters groups.

	Converters (n=8; 29.63%)	Non-Converters (n=19; 70.37%)	Statistics	
			value ^a	p ^b
Age	21.38 ± 2.56	22.53 ± 3.95	85.50	0.631
Education	14 ± 3.42	12.9 ± 3.18	57.50	0.331
Gender				
F	2 (7.4%)	12 (44.44%)	3.283	0.103
M	6 (22.22%)	7 (25.92%)		
Cannabis Use				
Yes	4 (14.81%)	4 (14.81%)	2.262	0.183
No	4 (14.81%)	15 (55.55%)		
Urban Area				
Yes	3 (11.11%)	11 (40.74%)	0.938	0.420
No	5 (18.51%)	8 (29.63%)		
Pharmacological therapy				
Yes	2 (7.40%)	4 (14.81%)	0.051	1.000
No	6 (22.22%)	15 (55.55%)		

^a Continuous variables were analyzed using Mann-Whitney U test, while categorical variables were compared using a contingency table and; ^b The Chi-square p-value has been adjusted using Fisher’s exact test. Age and education are presented in mean years with standard deviation. F: female; M: male.

TABLE II. Descriptive (T0) and univariate statistics for the ASI scores in the Converters vs Non-Converters groups. Significant *p*-values are in bold.

	Converters (n=8)	Non Converters (n=19)	Statistics ^a		r_{rb} ^b	95% CI ^b	
			W	p		Lower	Upper
ASI Total score	20.00 ± 9.89	8.94 ± 8.27	33	0.024	-0.566	-0.810	-0.154
Feeling of Increased Significance	5.50 ± 2.23	2.78 ± 2.39	35	0.029	-0.539	-0.797	-0.117
Sense Sharpening	2.75 ± 2.188	1.26 ± 1.40	47.50	0.124	-0.375	-0.706	0.091
Impending Understanding	3.75 ± 1.38	1.84 ± 1.70	30.50	0.015	-0.599	-0.826	-0.203
Heightened Emotionality	4.25 ± 2.25	1.89 ± 1.88	32	0.019	-0.579	-0.817	-0.173
Heightened Cognition	3.75 ± 2.43	1.15 ± 1.74	30	0.012	-0.605	-0.830	-0.212

^aMann-Whitney U test. ^bFor the Mann-Whitney test, the effect size is given by the rank-biserial correlation (r_{rb}).

TABLE III. Results of the Type III Analysis of Variance with Satterthwaite's method from linear mixed models for the SOPS scores. Significant *p*-values are in bold.

	SOPS Pos		SOPS Neg		SOPS Dis		SOPS Gen		SOPS Tot	
	F value	p	F value	p	F value	p	F value	p	F value	p
Time	6.6420	0.016	4.220	0.051	2.037	0.166	3.254	0.083	5.582	0.026
Conversion to psychosis at T1	30.771	<0.001	5.136	0.035	6.867	0.016	0.239	0.630	11.099	0.003
Gender	0.006	0.939	0.269	0.610	0.001	0.981	0.728	0.404	0.198	0.661
Cannabis use	3.560	0.074	0.321	0.577	1.162	0.294	7.663	0.012	3.412	0.080
Urban area	2.311	0.144	0.838	0.371	4.750	0.041	5.654	0.028	2.700	0.116
Age	3.646	0.071	0.244	0.627	1.168	0.293	0.443	0.514	1.515	0.233
ASI Total score	1.350	0.259	0.168	0.687	0.004	0.952	2.102	0.163	0.107	0.747
Time × Conversion to psychosis at T1	25.744	<0.001	22.919	<0.001	13.864	0.001	32.864	<0.001	30.838	<0.001

months, eight (29.63%) patients transitioned to psychosis. Among those who transitioned to psychosis, only two subjects (7.40%) were receiving ongoing treatment: one with a low dose of an SSRI and the other with a Z-drug. Remission from the APS condition was observed in three (11.11%) subjects.

No statistically significant differences were observed between the Converters and Non-Converters groups regarding gender, age, years of education, cannabis use, urbanicity, and previous pharmacological therapy. Detailed descriptive and univariate statistics of sociodemographic characteristics in the Converters and Non-Converters groups are provided in Table I.

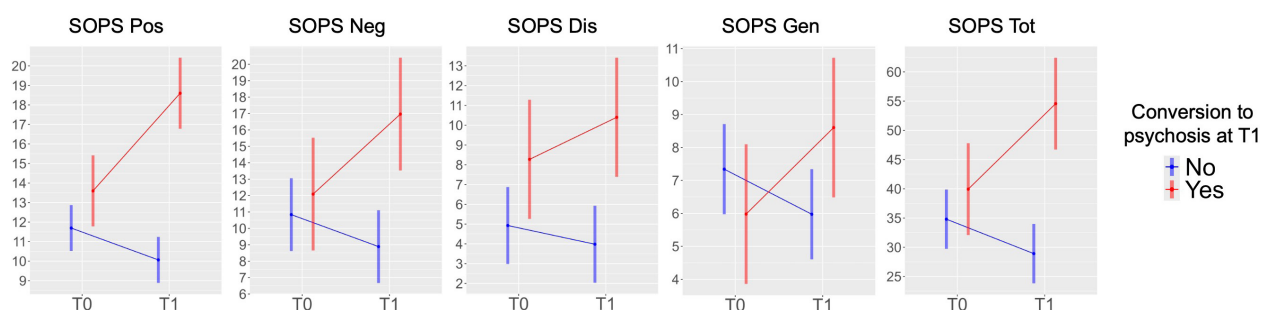
Furthermore, differences in ASI total and subscale scores between the two groups emerged. Baseline ASI total score and four out of five ASI subscale scores

("Feelings of increased significance", "Impending understanding", "Heightened emotionality", and "Heightened cognition") were significantly higher in the Converters group compared to the Non-Converters group. The "Sense sharpening" subscale did not reach statistical significance. Descriptive and univariate statistics for the ASI are reported in Table II.

The LMM analysis (summarized in Tab. III) identified significant main effects of "Time" and "Conversion to psychosis at T1" across multiple SOPS domains. Additionally, all interaction effects between "Time" and "Conversion to psychosis at T1" were found to be significant. The results of pairwise comparisons are summarized in Table IV. At baseline (T0), no significant differences between the Converters and Non-Converters groups across all SOPS domains were identified. At T1, a slight but not

TABLE IV. Results of the pairwise comparisons with Scheffé's method based on the estimated marginal means of linear mixed models for the SOPS scores. Significant *p*-values are in bold.

	SOPS Pos		SOPS Neg		SOPS Dis		SOPS Gen		SOPS Tot	
	Effect size	p	Effect size	p	Effect size	p	Effect size	p	Effect size	p
T0 No – T0 Yes	-0.868	0.4406	-0.524	0.9534	-2.415	0.4010	1.166	0.7939	-0.828	0.7859
T1 No – T1 Yes	-3.892	<0.0001	-3.377	0.0109	-4.635	0.0253	-2.251	0.3047	-4.138	0.0003
T0 No – T1 No	0.744	0.1819	0.814	0.1256	0.684	0.2433	1.179	0.0136	0.951	0.0569
T0 Yes – T1 Yes	-2.280	0.0015	-2.039	0.0047	-1.535	0.0430	-2.246	0.0018	-2.359	0.0010

**FIGURE 1.** Changes in SOPS scores between T0 (baseline) and T1 (follow-up) for Converters and Non-Converters groups. Error bars represent the 95% confidence intervals.

Yes (Red lines): Converters

No (Blu lines): Non-Converters

significant general improvement in symptoms in the Non-Converters group ("T0 No" vs. "T1 No") across all SOPS dimensions emerged. In contrast, the Converters group ("T0 Yes" vs. "T1 Yes") experienced a significant worsening of symptoms across all SOPS domains, with a notable deterioration progressively. Figure 1 reports changes in symptoms over time in both groups: patients who converted to psychosis showed higher SOPS scores than those who did not convert to psychosis.

Discussion

The primary aim of this study was to evaluate the transition rates to full-blown psychosis in a cohort of CHR-P during the COVID-19 pandemic. Our study revealed a transition rate of approximately 30%, which is notably higher than the typically 1-year transition rate of around 15% reported in recent literature^{9,37}.

Conflicting findings in this area have emerged following the COVID-19 pandemic period. A pilot study by Carrión *et al.* did not observe an increase in the conversion rate among 15 adolescents with CHR-P²⁴. Surprisingly,

this cohort demonstrated resilience despite several pandemic-related stressors and exhibited a reduction in attenuated positive symptomatology. The authors suggested that staying at home provided a unique opportunity for increased family support, which may have contributed to these outcomes.

During the COVID-19 pandemic, the incidence of first-episode psychosis (FEP) increased by 45% in South London²⁶. In contrast, a non-significant decrease in FEP diagnoses was observed in Catalonia (Spain), while a non-significant short-term increase was reported in Melbourne (Australia)^{25,27}. However, O'Donoghue and colleagues²⁵ noted a significant rise in voluntary and involuntary hospital admissions related to FEP. Although the study design did not allow for identifying the reasons behind the higher admission rates, the authors hypothesize that this increase could be linked to greater severity of psychotic symptoms, potentially caused by delays in help-seeking and referrals.

We also evaluated the longitudinal course of psychopathological characteristics in our APS group. The lack

of differences between Converters and Non-Converters groups in SOPS scores at baseline suggests that those who eventually converted to psychosis (“T0 Yes”) and those who did not (“T0 No”) exhibited similar levels of psychopathology. The general improvement at follow-up in the Non-Converters group (“T0 No vs. T1 No”) across all SOPS dimensions is consistent with the literature¹². However, this improvement only reached statistical significance for the SOPS General dimension. The progressive deterioration across all SOPS dimensions in the Converter group resulted in significantly higher symptom scores in the positive, negative, and disorganization domains compared to the Non-Converters group. While the literature suggests that Non-Converters typically differ from Converters only in attenuated positive symptomatology¹², our findings also indicate significant differences in negative symptomatology.

Notably, negative symptomatology was only moderated by “Conversion to psychosis” in our LMM. Although negative symptoms are often the first to develop in CHR-P³⁸ and are associated with a wide range of impairments and deficits^{39, 40}, further studies are needed to clarify the meaning and specificity of these symptoms in this population and their role in differentiating specific subtypes or comorbid conditions⁴¹⁻⁴³. The impact of the COVID-19 pandemic on all five domains of negative symptoms (alogia, blunted affect, anhedonia, avolition, and asociality) in CHR-P has also been investigated by Strauss *et al.*²², who found that negative symptoms did not increase during the pandemic.

Furthermore, even if our findings showed an increased rate of the transition to psychosis, no significant association between cannabis use and the transition was highlighted. Cannabis is currently one of the most widely used substances in the world, and it has been hypothesized as a risk factor for psychosis conversion^{44, 45}. However, the relationship between cannabis and the transition to psychosis is complex, with only high levels of consumption being associated with substantial risks⁴⁶. Our study did not evaluate the extent of cannabis consumption. The reduction of social gatherings during the pandemic may have played a role in diminishing consumption rates and reducing the impact on transition. While an increase in alcohol consumption during the pandemic has been reported, research on cannabis use shows mixed results^{47, 48}. We speculate that individuals who accessed cannabis during the pandemic may have exhibited higher levels of functioning, such as stronger social networks. Those who continued using cannabis despite lockdowns and restrictions might have demonstrated greater resilience or adaptive coping strategies, potentially mitigating stress-related exacerbation of psychotic symptoms. Since low functioning is a key feature and potential predictor of psychosis

conversion, cannabis users in our sample may have been less likely to convert to psychosis. Furthermore, the small sample size likely influenced this outcome.

Substantial evidence indicates that urbanicity is associated with an increased incidence of psychosis spectrum disorders⁴⁹. This association is heterogeneous and influenced by various risk and protective factors, which may differ across ethnic groups and countries. The degree of urbanicity, often measured by population density, has been linked to a 1.5- to 4-fold increase in the incidence rates of psychoses^{50, 51}. Notably, significant variation in incidence has been observed across neighborhoods, with adverse urban effects more strongly tied to social and economic factors than population density⁵². Our study could not account for socioeconomic variables critical to understanding the relationship between urban living and psychosis.

Additionally, the small sample size likely limited the statistical power of our analysis. While urban environments often offer protective factors such as access to healthcare and resources, these advantages were significantly reduced during the COVID-19 pandemic due to severe restrictions on hospitals and mental health services, particularly in our country. Consequently, the protective effects typically associated with urban living were diminished. Despite these considerations, the mechanisms underlying the relationship between urbanicity and psychosis risk remain poorly understood. Future longitudinal studies are needed to explore how the COVID-19 pandemic affected mental health outcomes in urban populations and to elucidate the interplay between urbanicity and psychosis risk.

The Converters group had significantly higher ASI scores at baseline than the Non-Converters group. Differences in the “*Feeling of increased significance*” and “*Impending understanding*” subscales are particularly central to Kapur’s model, which identifies aberrant salience as a risk factor for psychosis⁵³. Moreover, the sequence of “*Increased significance*”, “*Impending understanding*”, and “*Heightened emotionality*” has been interpreted as reflecting the progression from a pre-delusional state to fully developed psychotic experiences⁵⁴. In our study, all these subscales showed statistically significant differences between the two groups, suggesting a trajectory of delusional from early cognitive changes to full psychotic manifestations.

These findings further support the utility of the ASI in multi-stage screening strategies^{54, 55} and highlight its importance in clinical settings to enhance early identification and intervention. Incorporating ASI into routine assessments could improve the prediction of psychosis onset and guide timely preventive measures.

Lastly, remission from the APS condition was observed in only 3 subjects (11.11%), which is significantly lower

than the approximately 48% reported in the literature¹². This discrepancy underscores the need for further investigation into factors influencing remission rates, particularly in the context of pandemic-related stressors and healthcare disruptions.

Stressful events, despite their heterogeneous nature, are well-established risk factors for various mental health conditions¹⁸⁻²⁰. Psychosocial stress, in particular, has been recognized as a potential contributor to the onset of psychotic-like experiences (PLEs) in CHR-P⁵⁶. Based on our findings, we hypothesize that pandemic-related stressors may have contributed to the observed psychopathological deterioration in our sample. Factors such as psychosocial stress, social isolation, and reduced physical activity may have exacerbated positive psychotic symptoms, potentially increasing the likelihood of psychosis conversion and hindering APS remission⁵⁷. Additionally, pandemic restrictions discouraged patients from seeking healthcare services unless urgent care was required, potentially delaying the detection of early-course psychosis and CHR-P states²⁵.

Conversely, while risk factors like social withdrawal, stress, and unemployment were prevalent among youths, some individuals may have exhibited a reduction in at-risk behaviors, such as cannabis consumption, during the pandemic²³. Interestingly, Arranz and colleagues demonstrated that although individual risk factors, such as recent stressful events, may not significantly explain the transition to psychosis, the cumulative presence of multiple risk factors has a potentiating effect⁴⁶. On the other hand, Kraan *et al.* reported contradictory findings, suggesting that the category of recent life events may be too heterogeneous to yield meaningful results on psychosis transition⁵⁸.

Furthermore, emerging studies suggest an increase in PLEs in youths following SARS-CoV-2 infection^{59, 60}. However, this association appears to be mediated by depressive and anxiety symptoms^{59, 60}, reinforcing the link between affective symptomatology and PLEs^{55, 61-63}. Despite the complex and variable effects of the pandemic on known risk factors, the overall stress and disruption it caused may have contributed to the heightened risk of transitioning to psychosis. Future research should aim to better understand the role of environmental stressors and psychosis vulnerability in increasing the likelihood of conversion to full-blown psychosis in CHR-P.

Strength and limitations

A major strength of this study lies in the exclusive inclusion of individuals with APS who had not received antipsychotic drug treatment. This approach enables a more precise evaluation of the natural course of the condition, free from the confounding effects of medications, and

provides more accurate insights into the relationship between risk factors and the transition to psychosis. We excluded CHR-P who had previously been treated with antipsychotic drugs, as such treatments are regarded as functionally equivalent to a transition to full-blown psychosis⁶⁴.

The main limitation of our study is the small sample size, which reduces statistical power, increases sampling error, and limits the generalizability of findings. Additionally, this limitation may have restricted our ability to evaluate the impact of most variables on the risk of transition to psychosis.

The higher rate of transition observed in our study may also have been influenced by reduced access to healthcare services during lockdowns and restrictive measures. These circumstances likely resulted in a selection bias, as only patients with more severe symptoms may have sought psychiatric evaluation, while individuals with milder symptoms were less likely to receive attention.

Conclusions

Our findings indicate a higher-than-expected transition rate to psychosis among individuals with APS during the COVID-19 pandemic. No significant association was found between known risk factors, such as cannabis use and urbanicity, and the transition to psychosis. These results may have been influenced by the small sample size of our study, potential changes in cannabis consumption during the pandemic, or the absence of standardized measures for assessing cannabis use.

Further retrospective studies with larger sample sizes and longitudinal designs are needed to clarify transition rates during major stress events, such as the COVID-19 pandemic. Such research could help identify specific factors and phenotypes among CHR-P that influence the course and prognosis of psychosis^{41,65}. Additionally, these studies could explore the complex interplay between environmental stressors and psychosis vulnerability, providing valuable insights into mechanisms underlying these transitions.

Abbreviations

Table III and Table IV; Figure 1:

SOPS = Scale of Prodromal Symptoms.

SOPS Pos = Scale of Prodromal Symptoms positive symptoms.

SOPS Neg = Scale of Prodromal Symptoms negative symptoms.

SOPS Dis = Scale of Prodromal Symptoms disorganization symptoms.

SOPS Gen = Scale of Prodromal Symptoms general symptoms.

SOPS Tot = Scale of Prodromal Symptoms total score

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Conflict of interest statement

The authors declare no conflict of interest.

Authors' contributions

FFN, MP, AC, LL: data collection and curation; MR and GDL: conceptualization, investigation, methodology, and supervision of the manuscript; CG and GDL: statistical analysis; FFN, AC, and EE wrote the first draft of the manuscript; GDL project administration, supervision, writing-review & editing; all the Authors reviewed and approved the final version of the manuscript.

Ethical consideration

The research was conducted ethically, with all study procedures being performed in accordance with the requirements of the 2013 World Medical Association's Declaration of Helsinki.

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