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# Pathways to care in first-episode psychosis in low-resource settings: Implications for policy and practice

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ABSTRACT

*Objective:* Developing countries such as India face a major mental health care gap. Delayed or inadequate care can have a profound impact on treatment outcomes. We compared pathways to care in first episode psychosis (FEP) between North and South India to inform solutions to bridge the treatment gap.
*Methods:* Cross-sectional observation study of 'untreated' FEP patients (n = 177) visiting a psychiatry department in two sites in India (AIIMS, New Delhi and SCARF, Chennai). We compared duration of untreated psychosis (DUP), first service encounters, illness attributions and socio-demographic factors between patients from North and South India. Correlates of DUP were explored using logistic regression analysis (DUP $\geq$ 6 months) and generalised linear models (DUP in weeks).
*Results:* Patients in North India had experienced longer DUP than patients in South India ($\beta = 17.68$, $p < 0.05$). The most common first encounter in North India was with a faith healer (45.7%), however, this contact was not significantly associated with longer DUP. Visiting a faith healer was the second most common first contact in South India (23.6%) and was significantly associated with longer DUP (Odds Ratio: 6.84; 95% Confidence Interval: 1.77, 26.49). Being in paid employment was significantly associated with shorter DUP across both sites.
*Conclusions:* Implementing early intervention strategies in a diverse country like India requires careful attention to local population demographics; one size may not fit all. A collaborative relationship between faith healers and mental health professionals could help with educational initiatives and to provide more accessible care.

## 1. Introduction

Developing countries such as India face a major mental health care gap (Pathare et al., 2018) meaning a large proportion of individuals with mental disorders do not receive adequate care or treatment. This gap is attributable to lack of a well-resourced public health system, low priority given to mental disorders, lack of political will, inadequate number of trained mental health professionals, social stigma and lack of awareness, and limited implementation capacity even for evidence-based interventions (Oliver et al., 2018; Raja et al., 2021).

Longer duration of untreated psychosis (DUP) increases risk of poor outcomes (Farooq et al., 2009; Oliver et al., 2018). DUP tends to be longer in low-and-middle income countries (LMICs) compared to high income countries, and there is often a large pool of undetected and untreated psychosis patients incarcerated, neglected, or abandoned (Large et al., 2008). When treatment is available, pathways to care (i.e.,

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help-seeking efforts of patients or carers) can be fragmented and complex (Chadda et al., 2001; Lilford et al., 2020). In a systematic review of early psychosis patients in LMICs (Lilford et al., 2020), the majority of patients (60–81%) contacted faith healers. This is concerning, considering first contact with faith healers is associated with longer DUP (Lilford et al., 2020).

Despite the success of Early Intervention in Psychosis (EIP) services in the West (McGorry, 2015), we cannot 'transplant' the Western specialist early intervention model to resource-poor settings, where even basic services are lacking (Singh et al., 2021; Singh et al., 2022). However, it might be possible to incorporate the principles and therapeutic components of the EI model into existing health care systems in LMICs (Hanna et al., 2018; Singh et al., 2020). The World Psychiatric Association considers early intervention as a strategic priority and has recently set up an expert advisory panel on implementing Early Intervention in LMICs (Singh et al., 2020).

India has vast regional disparities in availability and use of resources and services. South Indian states have higher rates of health care use and better accessibility to primary care facilities than North Indian states (Kumar and Rani, 2019). Further, there are cultural differences in attitudes towards non-biomedical or faith healers, with practices such as temple healing more culturally accepted in Northern regions (Khemani et al., 2020). Some studies show that patients from North India seek help from traditional healers as their first point of contact (Jain et al., 2012; Jilani et al., 2018; Naik et al., 2012), while patients from South India tend to contact professional mental health services first (Khemani et al., 2020). However, findings are not definitive with some studies from North India reporting that most patients (53.3–57.7%) contacted a professional service first (Chadda et al., 2001; Grover et al., 2014). Therefore, we conducted an exploratory retrospective study to directly compare pathways to care in North versus South India. Our research questions comprised the following:

1) Are there differences in first service encounters between patients with FEP in diverse social settings in India?

2) Do first service encounters in FEP have different correlates (e.g., sociodemographic factors & culturally mediated illness attributions) in these settings?

3) Does duration of untreated psychosis (DUP) differ, and have different correlates, across these settings?

## 2. Methods

### 2.1. Design and participants

The current study is part of the National Institute for Health Research-funded global health research group: Warwick-India-Canada designed to understand and reduce burden of psychotic disorders in India (see Singh et al., 2021 for more details). We selected two study sites that differ in the population they cater to, and type of service provision. The Schizophrenia Research Foundation (SCARF), based in Chennai, is a specialist mental health facility offering out-patient, in-patient, day centre and rehabilitation services for persons with mental illnesses including psychosis (Vaitheswaran et al., 2021). Chennai has a population of over 7 million and is the fourth largest metropolis in India. SCARF is the only specialised clinic for first episode psychosis (FEP) in Chennai (Dhandapani et al., 2021). The clinic provides (a) case management (b) pharmacological management (c) family intervention and (d) close monitoring of symptoms & social functioning (Malla et al., 2020).

The All-India Institute of Medical Sciences (AIIMS) in New Delhi, North India is a tertiary academic centre. New Delhi has population of 30 million and patients attending AIIMS are often from some of the poorest and most deprived communities. AIIMS is not a single hospital, but a conglomerate of facilities in different regions (e.g., Raipur, Jodhpur) of India including New Delhi. The population at AIIMS, new Delhi, comes from a long distance, including different states such as Uttar Pradesh, Bihar, pockets of Uttarakhand, Rajasthan and Madya Pradesh, which have poor mental health care facilities (Thirunavukarasu & Thirunavukarasu, 2010). Both AIIMS and SCARF used a standard management protocol for patients with FEP (Chadda, Singh, Thara, Sood, & Padmavati, 2022).

Following informed written consent, participants were recruited between August 2018 and December 2020. Diagnosis of FEP was ascertained by senior consultant psychiatrists at both sites based on the below eligibility criteria:

- First presentation with psychotic symptoms (or <30 days treatment with antipsychotics in any previous treatment episode)
- Aged 16–45 years
- Have one of the following ICD-10 diagnoses: schizophrenia (F20); persistent delusional disorder (F22); acute and transient psychotic disorders (F23); schizo-affective disorder (F25); other and unspecified psychosis (F28 & F29); mania with psychotic symptoms (F30.2); bipolar affective disorder, current episode manic with psychotic symptoms (F31. 2); severe depressive episode with psychotic symptoms (F32.3) and recurrent depressive disorder, current episode depression with psychotic symptoms (F33.3).

Participants were excluded if they had:

- An overt learning disability (equivalent to IQ <70)
- Organic brain damage, epilepsy, or pervasive developmental disorder
- Primary diagnosis of a substance use disorder
- Unwilling or unable to provide informed consent.

### 2.2. Measures

Duration of Untreated Psychosis (DUP) was assessed using the Nottingham Onset Schedule (NOS). The NOS has high test-retest and inter-rater reliability (Singh et al., 2005), and provides a standard measure for DUP in early intervention services (Fisher et al., 2008). It is a short-guided interview and rating schedule for establishing the chronology and components of symptom development in a first episode of psychosis. Information about the patient's history is collected prior to the interview from medical notes to develop a preliminary timeline. This timeline is then used with the patients and carers to guide the interview. Once all available information is collected, a final timeline and the following four time points are derived: 1) prodrome; 2) first psychotic symptom; 3) definite diagnosis; and 4) date of start of antipsychotics at adequate dosage. These time points are used to create three illness phases: i) the prodrome phase (time between the onset of prodrome and definite diagnosis); ii) duration of untreated psychosis (time between definite diagnosis and the start of antipsychotics at adequate dosage); and iii) duration of untreated illness (time between the onset of prodrome and the start of antipsychotics at adequate dosage). We categorized DUP as follows: 1) a dichotomous variable of short (≤6 months) versus long (>6 months) duration (Singh et al., 2015); and 2) a continuous variable in weeks.

The Emerging Psychosis Attribution Schedule (EPAS) was developed to complement the NOS interview (Brown, 2015), and has good inter-rater agreement (Singh et al., 2015). The EPAS consists of qualitative probes for the NOS symptoms. Patients are asked to recall how they attributed the psychosis symptom at the time when the symptom appeared. Responses are categorized into six main groups, based on the anthropological work of Cecil Helman: within the individual (e.g., psychological, physiological), natural world (e.g., accidents, injuries, germs/infections), social world (e.g., adverse events), supernatural world (e.g., spiritual possession, superhuman forces), unawareness of symptoms (no attribution reported), and cannot code. Each attribution type is coded in two ways: 1) as a percentage of the total number of illness attributions for each participant (e.g., 2 supernatural attributions

out of 4 total attributions=50%); and 2) as a dichotomous variable indicating the presence of at least one attribution, e.g., 1 =one or more supernatural attributions; 0 =no supernatural attributions (Singh et al., 2015).

We assessed first service encounters using an amended version of the Encounter form (Gater et al., 1991), the Service Encounters Interview (Brown, 2015; Singh et al., 2015). Medical notes and available information are collated into a timeline detailing a patient's journey to psychiatric care from the onset of the illness. This is presented to the patient and carers for confirmation, and to probe for any other help seeking avenues. Participants are asked to recall help seeking during the prodromal phase of the illness, as medical records rarely capture this information. Encounter types included: general practitioner, primary care team, faith healers (religious leaders, religious institutions, community healers), A&E department, private psychiatrist, general hospital psychiatry unit, family, friend, and other. Each service encounter was categorized as a dichotomous variable representing at least one encounter for each service type, e.g., 0 =no GP contact; 1 =at least one contact with GP (Singh et al., 2015).

Clinician-rated ICD-10 diagnosis was recorded for each patient. Categories included broad schizophrenia (schizophrenia, paranoid schizophrenia, schizoaffective disorder), psychosis not otherwise specified (NOS)/acute transient psychosis, bipolar disorder with psychotic symptoms, and other diagnosis (severe depression with psychotic symptoms, persistent delusional disorder, and alcohol/ substance induced psychosis).

Socio-demographic variables included marital status (1 =married; 0 =unmarried, divorced, separated, or widowed); education (1 =graduated, including post-graduate and professional; 0 = did not graduate, including illiterate, literate, primary, middle, matriculation/ class 10, intermediate/class 12); religion (Hindu, Muslim/Islam, Sikh and Christian); distance from centre (in kilometres); residence (0 =urban; 1 =rural); gender (male=0; female=1); age of onset of illness (years); occupational status (0 = not in paid employment; 1 = paid employment; and 2 = student); and income (₹5–10,000 = 0; ₹10–20,000 =1; over ₹20, 000 =2; £1~ Rs 90).

### 2.3. Procedure

Ethical permissions for the study were provided by the University of Warwick's Biomedical and Scientific Research Ethics Committee (reference: REGO-2018–2208), and research ethics committees at all participating organisations.

### 2.4. Data analysis

Analysis was performed in SPSS version 25 in the following stages:

1) Chi square analysis (with risk ratios) and Kruskall-Wallis tests (for non-normal continuous data) to compare sociodemographic factors and psychotic symptom attributions between patients from AIIMS and SCARF.
2) Chi square analysis (for dichotomous outcomes) to compare first service contacts between patients from AIIMS and SCARF, and the correlates of these contacts at each site.
3) Logistic regression analysis (for dichotomous outcomes) and Generalised Linear models (suitable for skewed continuous outcomes) to compare Duration of Untreated psychosis between AIIMS and SCARF, and correlates of DUP at each site.
4) Supplementary multiple logistic regressions to compare first service encounters between North and South Indian patients controlling for potential confounders.

**Table 1**
A comparison of sociodemographic factors and psychosis symptom attributions between patients in AIIMS and SCARF.

| Sociodemographic factor | AIIMS (n=105) | SCARF (n=72) | Test statistics | p-value |
|---|---|---|---|---|
| *Gender* | | | | |
| Male | 61 (58.1%) | 33 (45.8%) | [Reference] | |
| Female | 44 (41.9%) | 39 (54.2%) | OR=1.64 (0.89, 3.00) | p=.108 |
| Age of onset (Mean; SD) b | 27.15 (7.81) | 28.27 (7.80) | OR=1.02 (.99, 1.06) a | p=.247 |
| Distance from AIIMS/ SCARF centre (Mean; SD) [c] | 225.49 (392.63) | 5.95 (5.05) | **OR=0.76 (0.69, 0.84)** | **p<.001** |
| *Residence* | | | | |
| Urban | 63 (61.8%) | 72 (100%) | Statistical comparison not possible | |
| Rural | 39 (38.2%) | 0 (0%) | due to low and empty cell counts | N/A |
| *Marital status* | | | | |
| Unmarried | 67 (63.8%) | 42 (58.3%) | [Reference] | |
| Married | 38 (36.2%) | 30 (41.7%) | OR=1.26 (0.68, 2.33) | p=.462 |
| *Education level* | | | | |
| Not graduated | 69 (65.7%) | 15 (20.8%) | [Reference] | |
| Graduate/post-graduate /professional | 36 (34.3%) | 57 (79.2%) | **OR=7.28 (3.63, 14.62)** | **p<.001** |
| *Religion* | | | | |
| Hindu | 89 (84.8%) | 65 (90.3%) | | |
| Muslim/Islam | 12 (11.4%) | 2 (2.8%) | | |
| Sikh | 3 (2.9%) | 0 (0%) | Statistical comparison not possible | |
| Christian | 1 (1.0%) | 5 (6.9%) | due to low and empty cell counts | N/A |
| *Occupation* | | | | |
| Not in paid employment | 45 (43.3%) | 26 (36.1%) | [Reference] | |
| Working | 36 (34.6%) | 23 (31.9%) | OR=1.71 (.92, 3.15) | p=.089 |
| Student | 23 (22.1%) | 23 (31.9%) | OR=1.75 (.88, 3.49) | p=.110 |
| *Monthly income* | | | | |
| Rs. 5-10 000 | 26 (24.8%) | 5 (6.9%) | [Reference] | |
| 10-20 000 | 36 (34.3%) | 30 (41.7%) | **OR=4.33 (1.48, 12.67)** | **p<.01** |
| 20 000+ | 43 (41.0%) | 37 (51.4%) | **OR=4.47 (1.56, 12.83)** | **p<.01** |
| *Duration of untreated psychosis* | | | | |
| < 6 months | 72 (69.2%) | 53 (81.5%) | [reference] | |
| 6+ months | 32 (30.8%) | 12 (18.5%) | OR=0.51 (0.24, 1.08) | p=.079 |
| Duration of untreated psychosis in weeks | 34.00 (24.5, 43.5) | 16.32 (4.36, 28.29) | B=17.68 (SE=7.78) | p<.05d |
| *Individual attribution* | **19%** | **41%** | N/A | **p >.001e** |
| At least one individual attribution | | | | |
| Yes | 9 (8.6%) | 45 (62.5%) | OR=17.78 (7.73, 40.91) | p<.001 |
| *Natural attribution* | **0%** | **8%** | | **p =.019e** |
| At least one natural attribution | | | | |

(continued on next page)

**Table 1** (*continued*)

| Sociodemographic factor | AIIMS (n=105) | SCARF (n=72) | Test statistics | p-value |
|---|---|---|---|---|
| Yes | 0 | 7 (9.7%) | Statistical comparison not possible due to low and empty cell counts | N/A |
| *Social attribution* | 41% | 37% | N/A | p =.912d |
| At least one social attribution | | | | |
| Yes | **22 (21.0%)** | **40 (55.6%)** | **OR=4.72 (2.44, 9.13)** | **p<.001** |
| *Supernatural attribution* | 40% | 15% | N/A | p =.009 f |
| At least one supernatural attribution | | | | |
| Yes | 21 (20.0%) | 20 (27.8%) | OR=1.54 (0.76, 3.11) | p=.230 |
| *Cannot code/no awareness* | | | | |
| Yes | **60 (57.1%)** | **11 (15.3%)** | **OR=0.14 (0.06, 0.29)** | **p<.001** |

Numbers include participants who reported their first service encounter; Bold type face indicates significant differences between North and South Indian patients; a OR: Odds Ratio > 1 indicates that the sociodemographic factor or symptom attribution is more likely in patients from South India. Risk Ratio < 1 indicates that the sociodemographic factor or symptom attribution is more likely in patients from North India; b No reference group as continuous predictor; c Distance in km; d Calculated using the generalised linear model; eIncluding divorced, separated, widowed; f Kruskall-Wallis test

## 3. Results

### 3.1. Characteristics of participants

Of 278 patients screened (156 at SCARF; 122 at AIIMS), 223 with FEP were enrolled into the study (115 at SCARF; 108 at AIIMS). Table 1 summarises the baseline characteristics of participants. Complete data was available for 177 (72 at SCARF; 105 at AIIMS) patients.

### 3.2. Differences in sociodemographic features and illness attributions between North (AIIMS) and South (SCARF) settings

Patients attending SCARF were significantly more likely to have higher educational level, come from a higher income bracket, live in an urban area, and live closer to the mental health centre than patients from AIIMS. Patterns of ICD-10 diagnosis varied by site. The most common diagnosis in SCARF patients was schizophrenia (85.2%), while in AIIMS it was Psychosis not otherwise specified/Acute and Transient psychosis (66.7%). SCARF patients were significantly more likely to report at least one individual or social psychotic symptom attribution, while AIIMS had a significantly higher proportion of supernatural attributions (out of total attributions reported). Patients from AIIMS were significantly more likely to not give an attribution for their symptoms as compared to SCARF.

### 3.3. Variations in first service contacts between settings

Table 2 compares first service encounters between patients from the two sites. AIIMS patients were significantly more likely to have a first encounter with a faith healer. SCARF patients were significantly more likely to visit a psychiatric hospital, while AIIMS patients were significantly more likely to visit a general hospital psychiatry unit.

**Table 2**
A comparison of first service encounters between patients from AIIMS and SCARF.

| Encounter | Total sample | AIIMS | SCARF | Chi square; *p* value | Risk Ratio (95% CIs)[a] |
|---|---|---|---|---|---|
| *General medical practitioner* | | | | | |
| Yes | 9 (5.1%) | 5 (4.8%) | 4 (5.6%) | 0.056; p = .813 | 1.18 (0.31, 4.54) |
| *Primary care team b* | | | | | |
| Yes | 5 (2.3%) | 4 (3.8%) | 0 (0%) | 2.81; p = .094 | N/A |
| *Counsellor* | | | | | |
| Yes | 2 (1.1%) | 0 (0%) | 2 (2.8%) | 2.95; p = .086 | N/A |
| *Psychiatric hospital* | | | | | |
| Yes | 32 (18.1%) | 8 (7.6%) | 24 (33.3%) | **19.07; p < .001** | 6.06 (2.53, 14.5) |
| *Private psychiatrist* | | | | | |
| Yes | 12 (6.8%) | 5 (4.8%) | 7 (9.7%) | 1.66; p = .197 | 2.15 (0.66, 7.08) |
| *General Hospital Psychiatry Unit* | | | | | |
| Yes | 33 (18.6%) | 28 (26.7%) | 5 (6.9%) | 10.95; p = .001 | 0.21 (0.08, 0.56) |
| *Casualty department* | | | | | |
| Yes | 1 (0.6%) | 1 (1.0%) | 0 (0%) | 0.69; p = .406 | N/A |
| *Faith healers*[a] | | | | | |
| Yes | 65 (36.7%) | 48 (45.7%) | 17 (23.6%) | 8.98; p = .003 | 0.37 (0.19, 0.71) |
| *Family* | | | | | |
| Yes | 2 (1.1%) | 1 (1.0%) | 1 (1.4%) | 0.073; p = .787 | 1.47 (0.09, 23.8) |
| *Friend* | | | | | |
| Yes | 3 (1.7%) | 0 (0%) | 3 (4.2%) | 4.45; p = .035 | N/A |

Bold type face indicates significant differences between AIIMS and SCARF. a Risk Ratio over one indicates that the service contact is more common in SCARF than AIIMS patients; Risk Ratio less than one indicate that first service contact is more common in AIIMS than SCARF patients. Includes religious leader, religious institution and community health practitioner. N/A: empty cells preclude analysis

### 3.4. Correlates of first service encounters for AIIMS and SCARF patients

Table 3 reports correlates of the most common first service encounters. Higher education level significantly positively predicted first contact with a general hospital psychiatry unit and significantly negatively predicted first contact with a faith healer in AIIMS. Being in paid employment and higher education level significantly negatively predicted faith healer contact in SCARF, whereas social and supernatural attributions significantly positively predicted contact with faith healers. Limited numbers in individual categories precluded statistical analysis of associations between religion and first service encounters. However, descriptive statistics indicated that those of a Muslim faith were considerably more likely to go to a faith healer: Muslim= 85.7%; Hindu= 34.4%; Christian= 0%; Sikh= 0%.

**Table 3**
Binomial logistic regression analyses of the correlates of first service contacts in AIIMS and SCARF respectively.

| Correlates | Psychiatric hospital Odd Ratio (95% CIs)[a] | | General Hospital Psychiatry Unit Odd Ratio (95% CIs)[a] | | Private psychiatrist Odd Ratio (95% CIs)[a] | | Traditional/religious Odds Ratio (95% CIs)[a] | |
|---|---|---|---|---|---|---|---|---|
| | AIIMS | SCARF | AIIMS | SCARF | AIIMS | SCARF | AIIMS | SCARF |
| Gender | 0.82 (0.19, 3.63) | 1.67 (0.61, 4.54) | 0.86 (0.36, 2.09) | 3.66 (0.39, 34.5) | 2.16 (0.35, 13.50) | 0.60 (0.13, 2.92) | 0.61 (0.27, 1.34) | 1.77 (0.57, 5.45) |
| Age of onset | 1.07 (0.98, 1.17) | 0.94 (0.88, 1.01) | 1.03 (0.98, 1.09) | 0.98 (0.87, 1.11) | 0.96 (0.85, 1.09) | 1.06 (0.96, 1.17) | 0.95 (0.91, 1.00) | **1.07 (1.00, 1.15)** |
| Distance from centre | 1.00 (0.99, 1.00) | 0.99 (0.90, 1.10) | 1.00 (1.00, 1.00) | 0.99 (0.81, 1.21) | 0.94 (0.83, 1.06) | 0.86 (0.58, 1.29) | 1.00 (1.00, 1.00) | 1.03 (0.93, 1.15) |
| Education | 2.03 (0.48, 8.65) | 2.33 (0.59, 9.23) | **3.80 (1.54, 9.40)** | N/A | 8.50 (0.91, 79.1) | 1.65 (0.18, 14.8) | **0.13 (0.05, 0.35)** | **0.24 (0.07, 0.83)** |
| Monthly income | | | | | | | | |
| Rs. 5–10,000 | N/A | | 1.62 (0.48, 5.46) | | | | | |
| 10–20,000 | | 0.64 (0.09, 4.53) | 1.82 (0.56, 5.88) | 0.29 (0.02, 3.92) | | | 0.66 (0.24, 1.81) | 1.00 (0.09, 10.66) |
| 20,000 + | | 0.81 (0.12, 5.50) | | 0.23 (0.02, 3.12) | N/A | N/A | 0.44 (0.16, 1.17) | 1.48 (0.15, 14.90) |
| Working | 2.36 (0.53, 10.42) | 0.83 (0.33, 2.12) | 1.42 (0.58, 3.49) | 0.35 (0.05, 2.24) | 0.49 (0.08, 3.07) | 0.73 (0.15, 3.55) | 1.13 (0.52, 2.46) | **0.14 (0.04, 0.48)** |
| Rural vs Urban | 0.21 (0.03, 1.78) | N/A | 0.59 (0.23, 1.54) | N/A | 0.39 (0.04, 3.61) | N/A | 1.66 (0.74, 3.71) | N/A |
| Individual attribution | N/A | 1.74 (0.61, 4.96) | 0.77 (0.15, 3.94) | 0.13 (0.01, 1.24) | N/A | 0.78 (0.16, 3.79) | 0.95 (0.24, 3.74) | 1.13 (0.36, 3.52) |
| Social attribution | 2.46 (0.54, 11.2) | 0.71 (0.27, 1.92) | 1.38 (0.50, 3.84) | 1.22 (0.19, 7.76) | 2.67 (0.42, 17.05) | 1.07 (0.22, 5.19) | 0.61 (0.23, 1.62) | **5.21 (1.34. 20.17)** |
| Supernatural attribution | **4.71 (1.07, 20.7)** | 0.40 (0.18, 1.37) | 0.83 (0.27, 2.52) | 1.82 (0.28, 11.76) | N/A | 1.04 (0.19, 5.88) | 1.10 (0,42, 2.87) | **6.43 (1.97, 21.01)** |
| Natural attribution | N/A | 0.78 (0.14, 4.36) | N/A | N/A | N/A | 4.80 (0.74, 31.3) | N/A | N/A |

Bold type face indicates significant associations a Odds Ratio over one indicates that the service contact is more common in South than North Indian patients; Odds Ratio less than one indicate that first service contact is more common in AIIMS than SCARF patients; NA: indicates empty cells in the analysis. Monthly income: Rs. 5–10,000; 10–20,000; 20,000 +

**Table 4**
Generalised linear models and binomial logistic regression analyses of the correlates of Duration Untreated Psychosis (DUP) in AIIMS and SCARF respectively.

| | **DUP in weeks[a] B; *p* value** | | **6 + months[b] Odds Ratio (95% Confidence Intervals)** | |
|---|---|---|---|---|
| **Correlates** | **AIIMS** | **SCARF** | **AIIMS** | **SCARF** |
| Gender | -10.15; p = .405 | **-7.99; p = .041** | 0.96 (0.41, 2.23) | 2.89 (0.70, 11.87) |
| Age of onset | -.065; p = .933 | **.711; p = .004** | 1.03 (0.98, 1.09) | **1.09 (1.00, 1.19)** |
| Education | 22.32; p = .073 | **19.90; p < .001** | 0.99 (0.41, 2.37) | **0.15 (0.03, 0.64)** |
| Monthly income | 3.91; p = .798 | -7.22; p = .182 | 0.39 (0.13, 1.18) | 1.14 (0.11, 12.25) |
| | −4.54; p = .744 | −1.08; p = .801 | 0.61 (0.22, 1.69) | 0.71 (0.07, 7.79) |
| Working | **34.18; p = .004** | **10.55; p = .007** | **0.31 (0.13, 0.73)** | 0.34 (0.09, 1.22) |
| Urban vs Rural | 5.53; p = .663 | N/A | 0.63 (0.26, 1.52) | N/A |
| Distance from centre | -.025; p = .105 | -.213; p = .577 | 1.00 (1.00, 1.00) | 0.94 (0.75, 1.18) |
| Faith healer contact | -17.27; p = .149 | **-16.49; p < .001** | 1.04 (0.45, 2.40) | **6.84 (1.77, 26.49)** |
| Psychiatric hospital | -18.61; p = .409 | **8.40; p = .041** | 2.43 (0.57, 10.40) | 0.14 (0.02, 1.15) |
| General Hospital Psychiatry Unit | 20.12; p = .134 | -8.65; p = .362 | 0.52 (0.19, 1.45) | 10.40 (0.86, 125.94) |
| Private psychiatrist | 19.05; p = .542 | 7.99; p = .244 | 0.74 (0.07, 7.42) | 0.87 (0.09, 8.24) |

Bold type face indicates significant associations; [a] Calculated using Generalised Linear Models for non-normal continuous outcomes: a positive value indicates a negative association with DUP and a negative value indicates a positive association with DUP; [b] Calculated using logistic regression analysis

### *3.5. Variations in Duration of Untreated Psychosis (DUP) and its correlates*

In the generalised linear model with DUP as a continuous outcome, AIIMS patients had a significantly longer DUP (duration in weeks) than patients from SCARF ($\beta = 17.68$; $p < .05$). AIIMS patients were more likely to experience a DUP of 6 or more months than SCARF patients, though the difference did not reach statistical significance (Odds Ratio: 0.55; 95% CI: 0.30, 1.04; $p = 0.079$).

Table 4 reports correlates of DUP for each site. Lower educational level, not being in paid employment, and having first contact with a faith healer was significantly associated with longer DUP in SCARF, where attending a psychiatric hospital was significantly associated with shorter DUP. Not being in paid employment was significantly associated with longer DUP in AIIMS.

## 4. Discussion

To the best of our knowledge, this is the first study to directly compare variations in FEP symptom attributions, first service encounters and DUP between patients accessing mental health services in two diverse settings in a LMIC. There are clear differences across the two sites. First, FEP patients attending AIIMS in North India have a longer DUP, have a faith-healer as the most common first help-seeking encounter, but faith-healing contact does not correlate with a longer DUP. In contrast, first contact with a faith healer in SCARF (though not the most common first contact – 23.6%) was significantly associated with longer DUP.

Higher education level, being in paid employment and visiting a psychiatric hospital were associated with shorter DUP in SCARF, while in AIIMS being in paid employment was the only correlate of shorter DUP. These regional variations are complex and most likely related to the socio-economic profile and service configuration differences across

the two settings.

A handful of studies from India have examined pathways to care in patients with psychotic disorders (Grover et al., 2014; Jain et al., 2012; Jilani et al., 2018; Kudi et al., 2022; Naik et al., 2012). Fewer still that have measured relationships between service encounters and DUP (Lahariya et al., 2010; Lukose et al., 2021; Mishra et al., 2011). Our findings relating to SCARF patients are consistent with a study from central India reporting that contact with a faith healer led to a greater delay in presentation in comparison to contact with a psychiatrist (Lahariya et al., 2010). Our findings relating to AIIMS patients converge with a recent study from rural South India where DUP was not related to type of first contact or socio-demographic factors (Lukose et al., 2021). The absence of these expected associations points to other potential causes of longer DUP. One plausible hypothesis is the deeply rooted socio-cultural explanation about cause of "abnormality" determining attitudes and stigma, which could prolong DUP (Compton and Broussard, 2011; Mishra et al., 2011; Mungee et al., 2016). AIIMS patients came largely from a poorer background, have a significantly lower education level, and attribute their symptoms to supernatural causes, all of which have been associated with stigma and negative attitudes towards psychiatrists (Mungee et al., 2016).

As traditional healers are often a first line of consultations for people in India, a collaborative model between faith healers and the modern healthcare system is indicated to narrow the treatment gap and reduce fragmentation by encouraging more integrated care (Green & Colucci, 2020; Jain, 2021). Collaboration is challenging and requires trust, rapport building, and open dialogue. However, a case study from India found that the collaborative model was viewed favourably by key stakeholders, especially on health improvement, livelihood restoration and holistic care, allowing both belief systems to play a shared role in care and recovery (Shields et al., 2016).

### 4.1. *Limitations of the study*

First, our study is limited by the small sample size. This might have reduced power leading to type II errors, therefore rendering this study exploratory rather than definitive. Second, our study was cross-sectional, thus we relied on patient's retrospective reports of psychosis symptom attributions and service encounters which might limit the generalisability of our findings, in addition to our ability to determine the direction of causality. Third, we did not assess all potential influences on service encounters and DUP such as attitudes towards professional healthcare workers and stigma. Fourth, our study only included patients who had presented to mental health services and retrospectively reported on their previous experiences. Thus, they might not be representative of individuals who never present to mental health services (Mishra et al., 2011). We should also consider that our sample might not be fully representative of all patients accessing the two centres. However, demographic characteristics of our two samples are largely similar to those reported previously at the two sites (Kudi et al., 2022; Malla et al., 2020; Mungee et al., 2016). Further, variations in diagnostic profile across the two sites might have confounded variations in help-seeking and DUP across sites. Finally, as the two settings varied in configuration and catchment area, it is possible that the observed findings partly reflect the difference in the nature of the two settings. Despite these limitations, this study is the largest clinical study to date directly testing variations in pathways to care between FEP patients in North and South India.

The key policy and practice implications of our findings are that the service configuration of early intervention in psychosis services in settings such as India need to be contextualised at a regional rather than national level, given the diversity of the population served.

## 5. Conclusions

This study has shown for the first time that FEP patients experience longer DUP in North than South Indian clinical settings and that correlates of DUP vary by region. Differences in correlates of DUP are complex and difficult to disentangle. They are likely underpinned by demographic (educational level) and socio-cultural factors (attitudes and stigma), highlighting a need for awareness and educational programmes especially in North India (Mungee et al., 2016).

## CRediT authorship contribution statement

Swaran P. Singh is the director of this global health research group. Swaran P. Singh conceived the original study design and obtained funding. Mohapradeep Mohan is the programme manager and contributed to revisions of the manuscript. Catherine Winsper conducted the analysis and assisted in the preparation of the first draft and subsequent revisions of the manuscript. Swaran P. Singh, Caroline Meyer, Jai Shah, Max Birchwood, Richard J. Lilford, Padmavati Ramachandran, Rakesh K. Chadda, Thara Rangaswamy, Mamta Sood, Jason Madan, Srividya N. Iyer, Vivek Furtado provided critical comments during the proposal-writing stage and WIC project meetings, and critically reviewed and revised the manuscript. All authors read and approved the final manuscript.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.ajp.2023.103463.

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