

Language and Schizophrenia: A Review of Studies in India

Amir Sultan^{1*}, Touseef Rizvi²

ABSTRACT

Background: Abnormal language is fundamental to schizophrenia sharing a common origin with it. Understanding the language of a person with schizophrenia is very important for the prognosis and intervention. This review focuses on published studies on language and schizophrenia conducted in the Indian subcontinent over the last fifty years. Besides, giving a summary of the research and results of the studies, the review focuses advocating further research with enhanced precision on various levels of research process. **Method:** Searches were conducted in PubMed and Asian Journal of Psychiatry and some of the articles were handpicked. Any empirical research that focused on the variables language and schizophrenia, and were done on the Indian population were included in the study. The review articles on the same variables were excluded. Studies were further subjected to qualitative evaluation whereas due to heterogeneity in the retrieved studies quantitative evaluation was not performed. **Results:** After a thorough search, we found very few relevant studies, numbering up to 11 out of 3486 studies. The 11 studies include publications as early as the 1970s. These studies in comparison to numerous studies published in the West emphasize the role of culture in understanding the disease, its relations to other symptoms, and its outcome. These studies focus on constructs like linguistic competence, content and form of language of persons with schizophrenia (PWS) and thought disorder. **Discussion:** Overall, most of these studies lacked precision. When we compared the national and international studies, we found gaps comprising studies lacking in theoretical and methodological rigour. We present a review of all the available research in this paper and emphasize the necessity of a revival of research in the field.

Keywords: *Language, Psychosis, Schizophrenia, Speech Disorder, Linguistic Competence, and Thought Disorder*

Introduction

Schizophrenia is a disease found with a prevalence of approximately 1% in the general population. Global level estimations have found about 20 million people in the world are suffering from it (James et al., 2019) and in India 3.5 million have this disease (Indian State Level Disease Burden Initiative Mental Disorder Collaborator, 2020) A person having schizophrenia can experience alterations of thought, hallucinations, delusions and

¹Doctoral Candidate, Department of Psychology, University of Kashmir, Hazratbal, Srinagar, Jammu and Kashmir, India.

²Professor, Department of Psychology, University of Kashmir, Hazratbal, Srinagar, Jammu and Kashmir, India.

*Corresponding Author

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disorganized speech (APA, 2013) as well as considerable impairments in daily life functioning particularly in language.

Language is one of the important aspects of schizophrenia. Abnormal language is central to schizophrenia (Andreasen, 1979; APA, 2013) and is considered to have a common origin with psychosis (Crow, 2008; Fraser et al., 1986), i.e., with the development of language in *Homo sapiens*, the development of psychosis followed. Also, abnormal language is at the root of symptoms like hallucinations, delusions, and formal thought disorder (Crow, 2008). All types of hallucinations, delusions, and categories of formal thought disorder are embedded in the language (Andreasen, 1979a).

General abnormalities of language include strangeness within a context, failure of narrative coherence, loss of purposeful association, idiosyncratic streams, perseverance, vagueness, and figurative language (Frow, 2001). Some of these abnormalities are found to be more specific in terms of diagnosis than Schneiderian First Rank Symptoms (Ceccherini & Crow, 2003) as well as important for the prognosis and intervention of the population (Smirnova et al., 2015; Varma et al., 1985).

Despite this noteworthiness of language in understanding schizophrenia, very few research studies have been conducted in Asian countries, particularly India. This dearth of research has been pointed out also by Bhatia (2019). There are almost 19,569 languages and dialects spoken in the country (Census, 2011). The number makes India a hotspot of language research having large prospects of yielding a wide range of information regarding the linguistic characteristics of the normal and abnormal population.

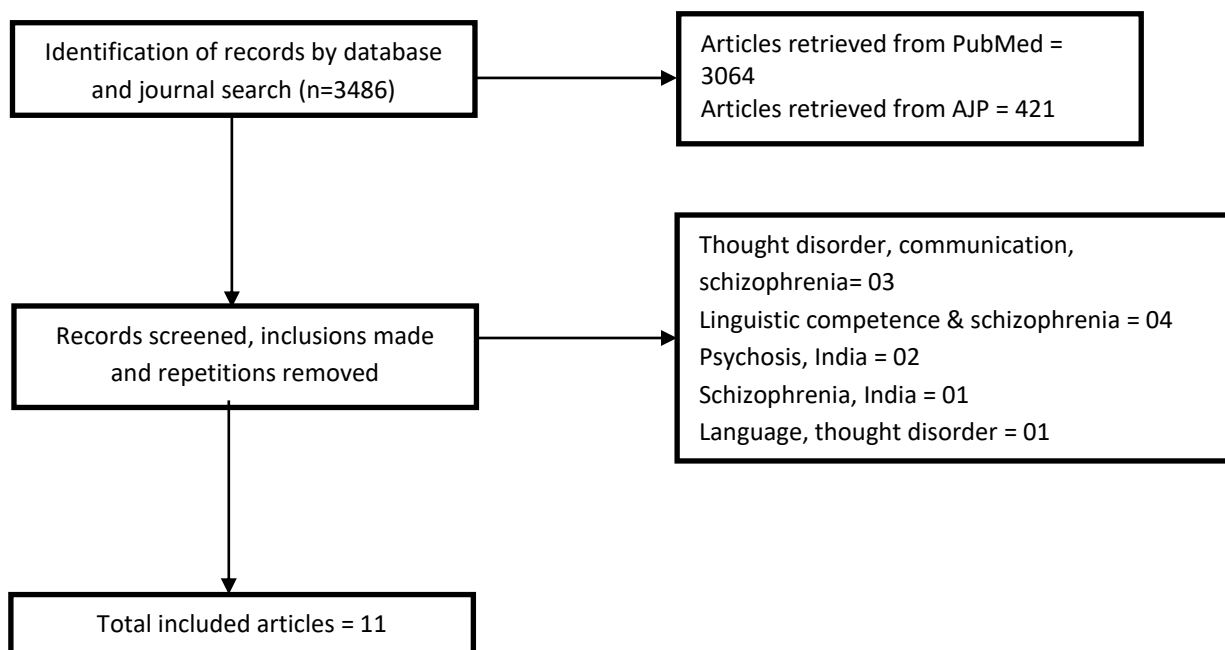
Further, the importance of conducting research can be understood by taking into consideration the unavailability of studies on cross-linguistic and complementary perspectives in language and schizophrenia. This review aims to highlight the status (present as well as past) of research in the area of clinical psycholinguistics here in India and provides a comprehensive picture of those studies. It also tries to highlight the scope and implications for future research.

METHODOLOGY

Firstly, it was quite challenging to find and retrieve research studies relevant to our problem as there are very few databases that have preserved research in India. There is also dearth of research databases here and the problems of access to them. However, some initiatives have been taken recently. Nonetheless, the authors devised a strategy that comprised thorough searching in the PubMed database, indexed Indian research journals, and handpicked articles.

A total of 3486 research papers were from PubMed (n=3064), Asian Journal of Psychology (n=421), and handpicked (n=01) (see supplementary files). After screening, inclusions were made on the basis 1) the study was done on schizophrenia participants from India, 2) the study was not a review article, and 3) the study assessed language, speech or linguistic characteristics in the persons with schizophrenia. Figure 1 further summarizes the procedure for the title selection in this review.

Figure 1: showing procedure of articles included in the study.



The search performed by keywords: language, psychosis, schizophrenia, speech, and thought disorder as well as Boolean phrases like language and schizophrenia, language and psychosis, speech disorder and schizophrenia, schizophrenia and India, and thought disorder and schizophrenia helped us retrieve 11 research papers out of the total number of articles.

RESULTS

Only 11 titles were retrieved and all the research papers were empirical in nature. The relevant studies were conducted by Indian researchers in various Indian psychiatric facilities. However, one study (Katz et al., 1988) was conducted in India by foreign researchers. Also, the retrieved studies examined constructs like linguist competence, thought disorder, form of speech, and content of speech.

All 11 studies reported a relation between linguistic constructs and the schizophrenia. Almost all studies focused on reporting problems of form of language. Content of language was neglected. The findings of these studies suggested lower fluency, perseveration, circumstantiality, and irrelevancy with frequent distraction among PWS (Singh, 1971). Moreover, perseveration was common in illiterate population and circumstantiality with clanging, echolalia, and neologisms to the literate populations (Mazumdar et al., 1988). Mazumdar et al., (1988) in the same study found the poverty of speech common in the acute PWS group and positive formal thought disorder in chronic PWS.

Linguistic competence (LC) as measured by the *Test of Linguistic Competence* constructed by Varma et al., (1985) was found independent of IQ and discrimination across participant groups of the study but not deteriorating with the onset of disease. Further, in another study (Varma et al., 1985a) with some changes in the scale and sample characteristics as well as size, researchers found some of the subtypes of schizophrenia had high LC, some low, and some with no consistent patterns at all. The researchers concluded that LC might have a role in determining the symptoms and course of schizophrenia. LC also predicted the prognosis of schizophrenia, particularly high competence of language indicated a poor prognosis and low competence of language indicated a good prognosis (Giridhar et al., 1992) among PWS.

In addition to it, the incoherent speech also predicted the prognosis of schizophrenia (Kulhara et al., 1989).

In another attempt, Mazumdar and his colleagues (1991, 1995) conducted two studies: one with a paranoid and non-paranoid groups of PWS and another with acute and chronic PWS. In the first study (Mazumdar et al., 1991) tried to determine the thought processes of paranoid and non-paranoid groups except for tangentiality nothing was found significant. In the second study (Mazumdar et al., 1995) poverty of speech was found significant between acute and chronic PWS. Also, positive thought disorder was found statistically significant among chronic PWS.

In a different framework, Ray and Ram (2012) conducted an EEG profile of FTD in PWS. In comparison to normal controls, schizophrenia patients with FTD had decreased regional power and intra hemispheric coherence; those without FTD had increased regional power and increased intra hemispheric coherence. Inter hemispheric coherence was greater in schizophrenia patients with FTD and lesser in those without FTD when compared to healthy participants.

Likewise, a detailed analysis of a single case of a female PWS (Bhatia, 2019) is discussed and the relation of language deficiency with deeper and more complex levels of combinatorial mechanism for building proposition meaning is given in the research paper. Insights into auditory hallucinations, poverty of topics, and distorted world view are also explained.

In terms of the content of language, a study (Katz et al., 1988) found expressions of PWS in India affective, negativistic, and agitated. Mostly the expressions were self-centered whereas in the Nigerian group the expressions were suspicious, bizarre, and anxious. Full details of the studies, participants, objectives, methodology, and findings are provided in table 1.

Table 1: Presenting results of the selected studies.

Study	Participants	Objectives	Methodology	Findings
Singh, M.V., 1971.	Group I 30 PWS from two Indian psychiatric hospitals with age range 15-35, another 10 normal controls with same age range were selected and named Group II. 10 PWS from the Group I were matched on age and education and named Group III.	Quantitative and qualitative assessment of thought disorder of form among PWS with the help of a psychometric test.	5 psychometric tests including fluency (FL) test, story recall (SR) test, proverbs (PR) test, similarity (SM) test and block design (BD) test.	Quantitative findings suggested PWS had lower fluency than normal controls. Also, they were unable to interpret proverbs as normal controls did. Perseveration, circumstantiality and irrelevancy with frequent distraction were noted as qualitative findings.
Varma et al., 1985.	In first try out 17 PWS and 13 normal controls and in second try out 30 PWS and 30 normal controls, age ranging 16-55 participated in the study.	Linguistic competence (LC) determines the manifestations and outcome of schizophrenia. Differences as per subtype of the disease and society were also calculated.	Test of Linguistic Competence (TOLC) with subtests namely colour naming (CN), filial relationships (FR), household objects (HO), mean length of utterance (MLU), emotion test (ET), picture arrangement (PA), temporal (TR) and spatial relationships (SR), vocabulary (VOCAB), definitions (DS) and similarities (SM) was devised then used on the population.	Comparison of the means found difference between normal controls and PWS on just CN and MLU tests. In both normal controls and PWS, FR, HO and PA showed significant positive correlations between each other. Similar correlations for TR and SR were reported. Also, PA correlated positively with MLU In the second try out with an increased sample size PWS group had results similar to previous group.
Varma et al., 1985a.	105 psychiatric patients categorised into sub types viz., acute schizophrenic (AS), episode, paranoid (PAR), chronic schizophrenia (CS), Manic Depressive Psychosis (MDP), Anxiety Neurosis (AN), Hysteria (HYS) and obsessive-compulsive neurosis (OCN). Tested for colour blindness and re-evaluated to upheld diagnosis	LC determines the manifestation and outcome of schizophrenia. High LC develops elaborate thinking disorder and bad prognosis and low LC leads to somatic symptoms and better prognosis.	Test of Linguistic Competence by Varma et al., (1985).	OCN, PAR and AN reported high LC. CS and MDP had low LC. HYS and AS showed no consistent pattern.
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Study	Participants	Objectives	Methodology	Findings
Mazumdar et al., 1988	45 PWS, acute and chronic diagnosed as per research diagnostic criteria (RDC) by Spitzer et al. (1978) of age ranging from 15-45. Persons with epilepsy, organic brain disorder, mental retardation etc. were excluded from the study	Assessing the magnitude and severity of thought disorder in PWS.	Brief Psychiatric Rating Scale (BPRS) by Overall & Gorham (1962) was used to assess mental state, for cognitive impairment Mini Mental State (MMS) and Thought, Language & Communication (TLC) by Andreasen (1978).	Poverty of speech was common among acute group, positive formal thought disorder in chronic group. Negative thought disorder was found more common among rural population, perseveration among illiterate group and clanging, neologisms, echolalia, circumstantiality more frequent in literate group.
Katz et al., 1988.	93 PWS (M= 64 and F= 29) with age ranging from 15-54 with expressed psychotic symptoms. Patients with organic cerebral disorder, CNS damage, and alcohol or drug abuse were excluded. 30% of the PWS were included referral by religious healers	Determining the behavioural and expressive qualities of PWS in two cultures: India and Nigeria.	Relatives Rating of Symptoms and Social Behaviour (KAS-R) by Katz and Lysterly, (1963). This scale has several subscales and clusters and one of them is Verbal Expansiveness (VE). Besides PSE, CATEGO and ICD-IX was applied to establish the diagnosis.	Results of the study reported expression with affective, negativistic and agitated features. Mostly the expressions were self-centred in nature with focusing on self away from people and having less regard about their feelings.
Kulhara et al., 1989.	112 PWS diagnosed as per ICD-9 were enrolled in the study. Reassessment using CATEGO Class S+, First Rank Symptoms, RDC, Feighner et al., Criteria and DSM-III was done. The patients were followed up after first assessment for a period ranging from 18-30 months.	Sociodemographic and clinical variables as prognostic indicators as well as outcome measurers of schizophrenia.	Clinical status and outcome assessment was done by PSE and BPRS. 47 variables of clinical and sociodemographic in nature were tested, incoherent speech was among them.	Amongst 47 variables only 18 approached statistically significant. Relevant to us from the 18 is incoherent speech which was found important in prediction of schizophrenia.
Giridhar et al., 1992.	40 PWS diagnosed as per RDC; 20 positive symptoms and 20 negative symptoms as per Andreasen & Olsen, (1982) matched individually for age (18-50), sex, education and place of origin included in the study. Persons having colour blindness and other medical or psychiatric illness other than schizophrenia were excluded from the study.	Differences among positive and negative schizophrenia on their LC. Finding relationship between LC, type and severity of symptoms. LC and its role in prognosis.	TOLC by Varma et al., (1985), Scale for the Assessment of Positive symptoms (Andreasen, 1984) and Scale for the Assessment of Negative Symptoms (1981). The patients were followed up for 6 months.	LC is related to positive as well as negative symptoms of schizophrenia and their severity. High LC indicated poor prognosis among positive schizophrenia but in negative schizophrenia it indicated good prognosis.
Mazumdar et al., 1991.	Based on RDC 45 un-medicated PWS, paranoid (n=21) and non-paranoid (n=24) were selected for the study. Another difference was made on the basis of acuteness and chronicity; duration of 06 months to 2 years was considered as acute and more than 2 years as chronic. Chi square test and Fishers exact test were used to determine significance of difference between the groups and sub groups.	To determine whether the thought process are different between paranoid and non-paranoid group of PWS.	A 45-min Semi-structured interview was conducted. The analysis of interview and thought disorder was assessed using categories TLC (Andreasen, 1978).	Poverty of speech, tangentially, derailment, loss of goal, perseveration and self-reference was common to paranoid group and the least common in this group was pressured speech, illogicality, clanging, neologisms, word approximations and echolalia etc. In the non-paranoid group, poverty of speech, tangentially, derailment, loss of goal and perseveration were common. However, the differences were not statistically significant, except tangentially which was found more prevalent in chronic PWS.
Mazumdar et al., 1995.	RDC based 45 PWS, acute (n=22) and chronic (n=23) with no brain syndrome, mental retardation, epilepsy or substance abuse disorder were incorporated in the study. Formal consent was taken and those who were on medication were given a 2-week washout period.	To compare thought disorder among acute and chronic schizophrenia.	Mini Mental State Examination and a 45-minute tape recorded interview was taken from the sample. TLC (Andreasen, 1978) was used for the categorization of the thought disorder. The differences between acute and chronic group were found by Fisher's exact test and t test.	The only sub category of thought disorder found significant between acute and chronic PWS was poverty of speech. Also, positive thought disorder was significant among chronic PWS. (Which is a discrepancy) The differences in other items were statistically insignificant.
Ray & Ram., 2012.	EEG profile of n=60 was recorded for sex matched drug free/naive schizophrenia patients, divided into two groups based on the presence and absence of Formal Thought Disorder (FTD) and a group of 30 matched healthy participants.	To conduct EEG profile of FTD in schizophrenia.	Coherence and power spectrum analysis were done.	As compared to normal controls, schizophrenia patients with FTD had decreased regional power and intra hemispheric coherence; those without FTD had increased regional power and increased intra hemispheric coherence. Inter hemispheric coherence was greater in schizophrenia patients with FTD and lesser in those without FTD, as compared to healthy participants.
Bhatia, T.K. (2019)	As per the article this is paper is part of project with 20-25 multilingual persons with schizophrenia. In this article speech patterns of a 36-year-old female PWS is discussed. The PWS is diagnosed with paranoid schizophrenia.	Giving an overview and salient features of the project and language organization in the mind of PWS. Documenting speech pattern of multilingual female PWS and then compare it with normal verbal behaviour. Lastly to establish thinking disturbances based on speech pattern of PWS.	Interview method focusing on naturalistic data, neutral topics and experimental data was used to collect the speech sample of the PWS. Besides, notes on actual linguistic utterances were taken. The patient was interviewed three separate times and three dimensions: syntax, semantics and pragmatics, were used to code the data.	A detailed analysis of a single case gives is discussed and the relation of language deficiency with deeper and more complex levels of combinatorial mechanism for building proposition meaning is given in the article. Insights into auditory hallucinations, poverty of topics and distorted world view is explained here.

DISCUSSION

The literature included in this review illustrates emerging patterns over time. The older studies and the recent ones have a huge difference in the conceptualization and assessment of constructs. There is also a difference in the criterion for the inclusion and exclusion of the participants in the studies. These patterns can be discussed under the following headings.

Linguistic Competence

On a very broader sphere, the term linguistic competence is defined as the knowledge of the language of a speaker (Blackburn, 2008). It is further restricted in Chomsky (1968) by connecting it to the association of sounds and meanings in accordance with the grammar of a language. Nonetheless, the concept of LC is very vast, even in the theory of Chomsky himself it is evolving but one thing should be taken into account that Chomskyian concept of LC cannot be operationalized as of its various idealizations (Taylor, 1988).

Our researchers (Varma et al., 1985, 1985a; Giridhar et al., 1992) as is evident from their papers have based and developed a tool of measurement in the Chomskyian theoretical background. This constitutes a weakness as it is established that Chomskyian concept of LC cannot be operationalized. Infact the components of *TOLC* can measure language in general terms but not LC. This was found in Shalve et al. (1981) and more recently deBoer et al. (2020). Both papers measured language by similar components as in *TOLC*.

Figure 2: Dimensions of linguistic competence

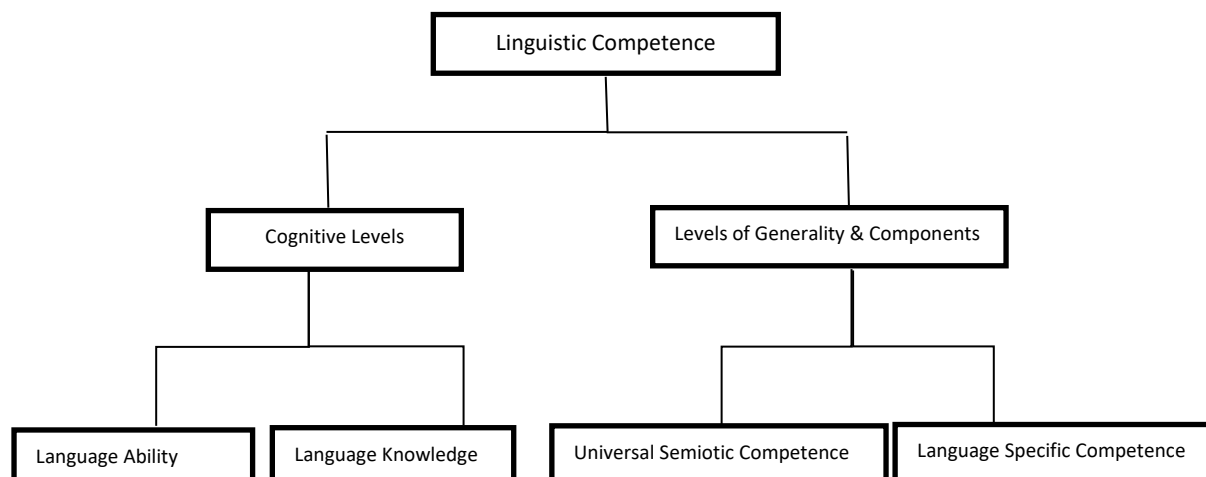


Table 2: Comparing components of LC as Per TOLC and Erfurt Pilot Study.

Components of TOLC (Varma et al. 1985)	Components of Erfurt Pilot Study (Lehmann, 2007)
Colour Naming	Story Construction
Filial Relations	Comprehension
Household Objects	Dialogue
Mean Length of Utterance	Recognizing Sounds
Total Morphemes	Recognizing Words
Picture arrangement	Finding Grammatical Errors
Vocabulary	Finding Missing Verbs
Temporal and Spatial Relations	Word-Meaning
Similarities	Analogies
Story Construction	Listening task
	Reading task
	Writing tasks
	Style tasks

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Even if we compare the concept of Indian researchers to a broader definition of LC (Lehmann, 2007) with cognitive levels, levels of generality, and components (see figure 2) the components do not concur completely (see table – 2). For future studies to assess LC anchoring Lehmann (2007) becomes inevitable.

Language as a Predictor

Language particularly incoherent speech was found to predict the prognosis of schizophrenia (Kulhara et al., 1989). This result is notable and in comparison with other studies, language was found predicting whether the speech is of a PWS or normal controls (Meter et al., 1993; Elvegag et al., 2008; deBoer et al., 2020). Studies also found language predicting the type of schizophrenia (Williams et al., 1976). These findings can prove fruitful to clinicians in understanding the outcome as well as the manifestations of the disease and then devising the proper strategies of intervention for PWS.

Criteria of Participant Selection

Studies included remarked on a continuously developing methodology in terms of participant selection. For instance, the first three studies (see table 1) mentioned no particular criteria for the participation of PWS in their study. However, in due time Mazumdar et al., (1988) as well as, Kulhara et al., (1989) and Giridhar et al., (1992), relied on RDC (Spitzer et al., 1978) and other criteria. The development can be noted in the sample size as well as the criteria for the inclusion and exclusion of the participants in these studies. An exception in the selection of participants can be found in the criterion of Katz et al., (1988). 30% of the sample was included by referral of faith healers.

Information about the sociodemographic and clinical characteristics of the sample in most of the studies is deficient. The diversification of the sample results in better precision of the study and reduces the role of biases. Future studies should focus on the diversification of the sample. Some of the suggestion that we like to make is to focus on stage of the disease, subtype of the disease, predominant symptoms, and premorbid linguistic abilities.

CONCLUSIONS

The review has highlighted several studies depicting the present status of research in the Indian subcontinent in the area of language and schizophrenia. The number of studies done here is very little and the quality of research is evolving. When compared to the international studies the research confirms as well as contradicts the suitable peers warranting further research, particularly from cross-cultural perspective focusing on sociodemographic and clinical characteristics. This review also provided a comprehensive picture of the gaps in available data and the need for the revival of research. There are inconsistencies found in and across the studies that are highlighted above and that need to be addressed.

Besides very little research is done in the area of schizophrenia generally. As per Grover et al. (2020), not more than 2803 paper are published since 1990 up till 2019 in India which forms a 2.04% global share and implies the need of further research generally.

Limitations

Some of the limitations of this review should be noted. Studies included in this review had a modified strategy that is not quite common in the methodological procedure of doing a review. However, it is not unheard of and there is a huge lag in the third world regarding the digitalization of records and research. Researchers here are still forced (due to the

unavailability of digital resources) to work differently; improvising the strategy of their work. However, we have tried to uphold the standard procedure as much as we could.

The number of included studies is small and varying, hence a quantitative assessment of various studied factors was not possible. From a different point of view, this might become a motivation for future researchers to add to these data gaps with better methodological rigour.

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Conflict of Interest

The author(s) declared no conflict of interest.

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