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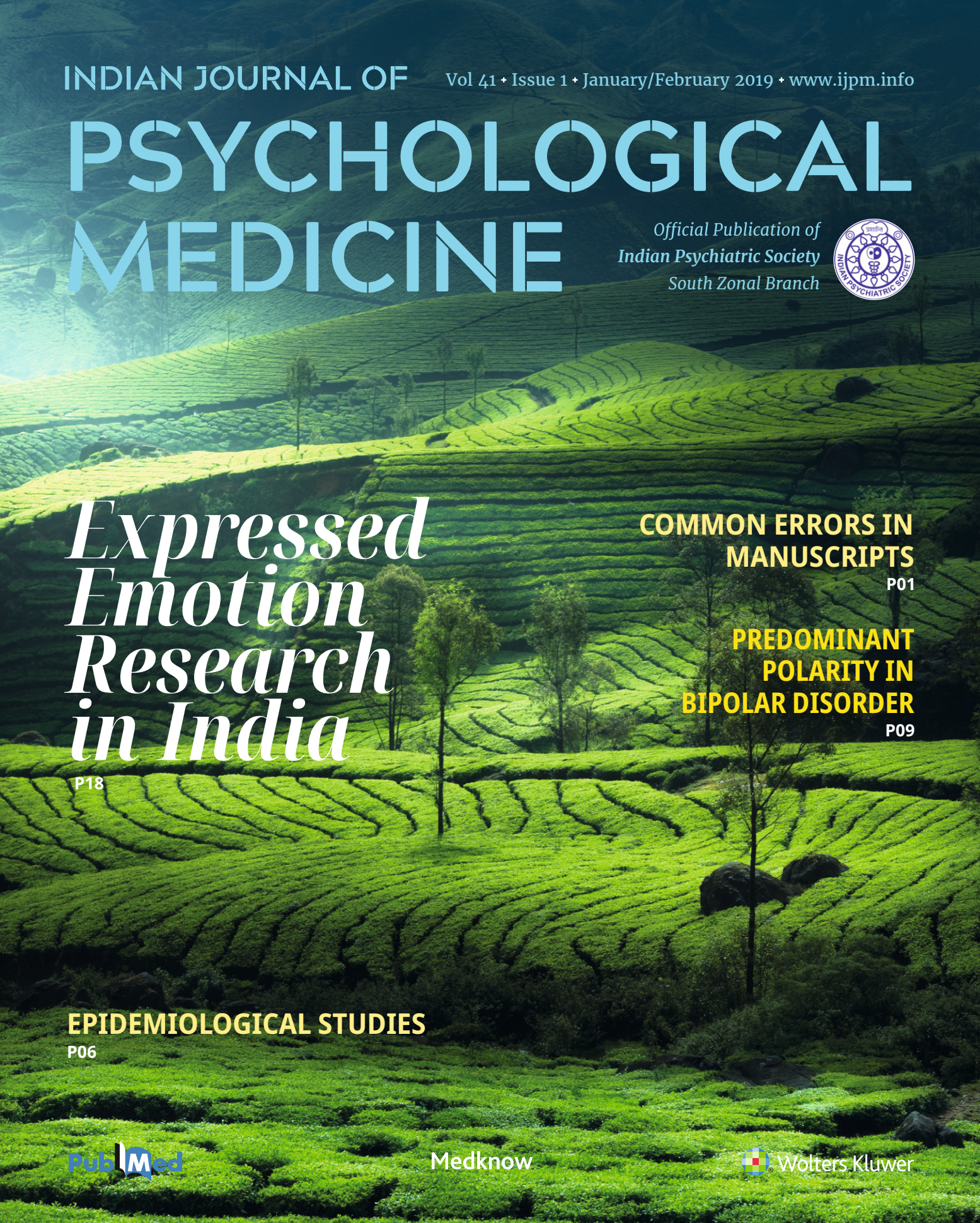
PSYCHOLOGICAL MEDICINE

Official Publication of
Indian Psychiatric Society
South Zonal Branch



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General Information

The journal

Indian Journal of Psychological Medicine (ISSN: Print-0253-7176, Online - 0975-1564) was started in 1978. It is a peer-reviewed journal published by Indian Psychiatric Society, South Zonal Branch. Dr. Abraham Verghese, then Professor of Psychiatry at Christian Medical college, Vellore, was the first editor. The journal publishes articles on psychiatry, psychology and allied disciplines. It is published bimonthly in January, March, May, July, September and November.

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The journal is approved by University Grants Commission (UGC).

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All manuscripts must be submitted online at http://www.journalonweb.com/ijpsym

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Soft copies of the journal will be provided free of cost to the members of Indian Psychiatric Society South Zonal Branch. A subscription to the hard copies of Indian Journal of Psychological Medicine comprises 6 issues. Prices include postage. Annual Subscription Rate are:

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- Images (jpg/jpeg/png/gif/tif/tiff): Submit good quality colour images. Each image should be less than 10 MB) in size
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Editorial

A Year On: The Changes We Introduced and the Common Mistakes Encountered

MAJOR STEPS

One year has passed since the current editorial team assumed the responsibility of this journal. Dr. MS Reddy, the immediate past editor, had done an exemplary job during his long tenure – he had made the journal bimonthly, got it included in PubMed and Scopus, and ensured and improved the scientific rigor of its content. Building on those efforts, we implemented a few more modifications to various aspects of the journal:

1. *Scope:* The "scope of the journal" was reworded as "Indian Journal of Psychological Medicine is a peer-reviewed, open access journal which publishes high-quality original research and review articles pertaining to all domains of psychiatric practice and research. Other categories of manuscripts we publish include viewpoints (opinion pieces) and commentaries and letters to editor on articles we recently published or other topics of current relevance. The journal caters to mental health professionals and trainees, including psychiatrists, psychologists, psychiatric social workers and psychiatric nurses as well as other medical professionals and paraprofessionals"
2. *Submissions:* It was decided to consider only those research papers that have the approval of an Institutional Ethics Committee, to publish case reports only as letters to the editor, and to ask all authors to submit the International Committee of Medical Journal Editors (ICMJE) Conflict of Interest Form. From July 2019, the journal will consider only those clinical trials which are registered with the Clinical Trials Registry-India (CTRI). For trials which started before 2014, retrospective registration is sufficient. Submissions from other countries should have registration in respective national registries. Minor changes were made to the author instructions, especially in the specifications for Brief Communications. It was clarified that submission on community preprint servers will not be considered prior publication and will not compromise potential publication in IJPM. A list of the kinds of online supplementary material that can be submitted and the specifications about video files were newly added. From January 2019, the authors should include a 'data sharing statement' in the first page file, and detailed instructions regarding the same are provided in the author instructions at the journal website.
3. *Peer review:* The editorial team and the pool of reviewers were expanded, and the position of Section Editors was created. The peer-review system was further strengthened, and all manuscripts recommended by the reviewers now receive two additional rounds of editorial review also. Starting in this issue, all January issues will feature a list of experts who peer reviewed for us in the previous year
4. *New posts:* Posts of Journal Ombudsman and Statistical Consultant were created
5. *Ahead of Print (AoP):* In June 2018, the journal started regular AoP publishing
6. *Social media:* Facebook (https://www.facebook.com/ijpsym/) and Twitter (https://twitter.com/ijpsym) pages were created for the journal
7. *New column:* "Learning Curve," a column by Dr. Chittaranjan Andrade, was started, keeping in mind the learning needs of practitioners and postgraduate students, in research methodology and recent developments in psychiatry, especially psychopharmacology
8. *Issue theme:* We are attempting to make each issue focus, to the extent possible, on a specific theme
9. *Cover:* From this issue, the journal has a redesigned cover
10. *Erratum charges:* If an erratum is necessitated due to obvious errors made by the authors during the submission, revision, or proofreading stages, they will have to pay the journal the page-designing charge, that is, Rs 1,200 per page
11. *Financial aspects:* The journal now has its own, new, bank account and Permanent Account Number, separate from those of Indian Psychiatric Society South Zonal Branch. A Finance Committee was formed and it would take care of the financial needs of the journal.

We would also like to summarize the common errors observed in the manuscripts received last year, hoping that this would benefit prospective authors, especially the postgraduate students.

ERRORS IN PLANNING

1. *"Stale" projects:* Lack of enough novelty in the manuscript and insufficient advancement over the available studies are common reasons for desk rejection. Although research is mostly incremental, and rarely transformative, articles which churn out repetitive findings are usually rejected unless we are convinced that the authors have taken steps to address the limitations of the existing literature. While desk-rejecting yet another cross-sectional study on burden or quality of life in schizophrenia or bipolar disorder or depression or obsessive compulsive disorder, we do think for a moment about the huge time and energy spent by the researchers, and more importantly by the patients and caregivers too, that went in vain simply because enough thought was not put initially into considering how novel the topic is. Another case in point is the numerous submissions on "correlates of internet addiction among medical students" we received in the past year, of which more than 80% were rejected for lack of novelty
2. *Weak rationale:* To support their paper, authors commonly give arguments like "this has never been studied before" or "this is the first study from India to examine this association." These are not enough. The authors should rather position the study rationale in a broader global and cultural context
3. *Ethical clearance:* It is always disheartening to reject otherwise excellent studies just because the authors did not obtain approval from the institutional ethics committee
4. *Sample size calculation:* Many authors do not perform *a priori* sample size calculation. This is important because smaller sample would be inadequately powered to detect associations of interest while using more than the required sample might throw up spurious associations.

SCIENTIFIC ERRORS

1. *Muddled hypotheses:* Like most other editors, we too are on the lookout for frugal and fresh ideas. Simple descriptive studies, such as profiling of cases presenting to, say, an outpatient setting, where there is no attempt to answer any prespecified hypothesis, usually end up being desk-rejected. Remember that a large sample size will not salvage such studies for reasons mentioned earlier. (Of course, there can be studies which do not require any hypothesis testing, like qualitative studies that are hypothesis generating)
2. *Methodological pitfalls:* Sometimes, the methods used are not the appropriate ones for the study questions. Improper or inadequate description of the methodological procedure adopted is common too. This usually involves a lack of sufficient detail in the paper due to which the editors feel the study cannot be replicated. Description of the sampling technique is often missing, and this creates difficulties in making judgments on the generalizability of the findings. Some authors confuse between random sampling and randomization. Other common errors include using instruments which are not validated for the local culture, using outdated than updated instruments, the absence of a control group, and selecting improper controls. These are major errors which threaten the internal validity of a study and negate its conclusions

   The above errors may require significantly more thought and work than technical corrections, and many of them are not correctable once the study reaches the drafting stage
3. *Data mining:* Sometimes, the authors do a secondary analysis of their data and when something positive turns up, write a paper on it as an afterthought. These practices go by various names such as salami slicing or data mining and are not only unethical but also reflect bad science. This differs from the splitting of data from a single research which may be legitimately carried out in certain situations.[1] Editors are more interested in hypothesis-driven than data-driven works. While exploratory analyses certainly have their place in medicine and biomedical research, they should be included in the main paper itself and do not deserve publication as a separate paper
4. *Review critically*: For review articles, we expect the subject to be topical and the authors to have added their own critical observations and synthesis of the literature. Simply collating the previous studies is not enough. These are important even for a narrative review. For a systematic review, the PICO (Patient/Population/Problem, Interventions, Comparison, Outcome) question has to be specified, and adherence to Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines enhances the chances of a manuscript[2]
5. *Statistical inaccuracy:* This ranges from major errors like the use of inappropriate tests (e.g., using tests when assumptions are not met) to minor problems like writing the *P* value as 0.000 or NS. Another common problem is conducting multiple hypotheses testing without statistical correction. Some authors place too much reliance on *P* values; instead, confidence intervals and effect sizes matter more and should be routinely reported and interpreted.

ERRORS IN DRAFTING

1. *Careless abstracts*: Absence of a structured abstract for original articles or brief communications and adding an abstract for a letter to the editor when none is needed are common. Many authors do not include their major findings in the abstract and instead say they "are discussed" [in the manuscript], forcing the editors to unnecessarily wade through pages and pages of results and discussion
2. *Figures and tables:* Inclusion of multiple, unnecessary tables with inappropriate title, structure, or footnotes is common. Sometimes, data in a table are too less and can easily be incorporated into the text. At times it makes more sense to combine two tables into one. Frequently, considerable overlap is observed between the tables/figures and the article text
3. *Mind your abbreviations:* The expansion of an abbreviation should be provided at the first instance of its appearance in the abstract and the main text, and only the abbreviation is to be used at the subsequent occurrences. However, frequently, the expanded form creeps in at multiple places in the manuscript. Expansion of abbreviations should be done separately for the tables, in their footnotes
4. *Extensively described tools:* Avoid including unnecessary information about the instruments/measures used. For instance, if you used the World Health Organization Quality of Life – BREF (WHOQOL-BREF) scale, a reference to the measure and a description of how you used the scores (raw or transformed) for analysis may suffice; there is no need to write "This instrument was derived from the larger WHOQOL-100...". If you used General Health Questionnaire (GHQ), mention the version (GHQ-5/GHQ-12/GHQ-28), the way the scores were used (bimodal or Likert scale) and interpreted, and the cut-offs used if any. Provide enough descriptions if the scale used is uncommon. Give details of any modifications, translation, or adaptation done. It is a desirable practice to report sample-specific reliability statistics such as Cronbach's alpha
5. *Subheadings galore:* Some authors use separate subheadings for primary/secondary objectives, design, subjects, type of study, nature of the control group, and so on. This is unnecessary and makes the paper cumbersome to read. The accepted sections for an original article, during submission, are structured abstract, introduction, methodology, results, discussion, *followed by* references and tables/figures
6. *Meandering discussion:* Many authors seem to believe that the discussion section is meant to be an emotionless list of available studies which agreed or disagreed with the findings of the paper. However, a good discussion section should elaborate the important results and address their theoretical and practical consequences.[3] At the same time, one should not wander away from the results obtained, and speculative statements should be avoided
7. *Stupendous conclusions:* It is not uncommon to see conclusions that are not supported by the study design, data, or results. For instance, a cross-sectional study on the association between prenatal depressive symptoms and infant outcomes concludes a causal association between the two when all that can be surmised is that prenatal depression is associated with poor infant health. Avoid making recommendations which are not commensurate with the study results. Do not "copy-paste" sentences from the results or discussion – rather, summarize and highlight the most important and relevant findings
8. *Cite wisely:* Especially if the study was done years ago or if the manuscript has been in a submission–rejection–resubmission cycle for quite some time, the references may get outdated. Ensure that important recent references are included, especially in the discussion section. Avoid citing several studies to substantiate every single point. Avoid too many self-citations
9. *Follow reporting guidelines*: For randomized controlled trials (RCTs), we check whether the major sources of bias, such as sequence generation, allocation concealment, and blinding of outcome assessors, have been described adequately. Choice of incorrect data treatment methods is common. One way to ensure completeness while reporting RCTs is to follow the Consolidated Standards of Reporting Trials (CONSORT) checklist.[4] For other study designs, see appropriate guidelines in Enhancing the QUAlity and Transparency Of health Research (EQUATOR) network (http://www.equator-network.org/)
10. *Contextualize case reports*: Lack of sufficient discussion/contextualization is common in case reports. It is not enough to accurately describe the case and the findings. Highlight the novelty and adequately contextualize the findings with the extant literature.

The second author (SKP) has written in detail about the solutions to common errors committed while preparing abstracts,[5] tables,[6] images,[7] and references.[8] Two Indian books too are available to guide inexperienced researchers.[9,10]

ERRORS IN LANGUAGE

1. Avoid the use of "case sheet language" such as "hrs," "yrs," "h/o," and "c/o."

2. Do not confuse between
   - "few" and "a few"
   - "since" and "because"
   - "that" and "which"
   - "since" and "for" or
   - "its" and "it's"
3. Most authors are mindful of the guideline that one should not start a sentence with a number. In their eagerness to comply with this, some authors begin many sentences in their results section like "About 38.25% of the sample were …" or "In our study, 38.25% of the sample were …." While the first example makes the values appear less precise, the second style gets monotonous and also inflates the word count
4. Be brief. Here are some common examples of bloated writing and their leaner counterparts:
   - "The study by John *et al*. found that …"/"John *et al*. found that …"
   - "John *et al*. conducted a study to assess the …"/"John *et al*. studied the …"
   - "the findings of this study"/"our findings"
   - "results of previous studies indicate that …"/"previous studies indicate that …"

   Avoid unnecessarily repeating "in this study," "in the present study," or "in our sample." From the context itself, it would be clear that yours is the paper being referred to
5. Keep the verb tense consistent. Instead of "The patient has been coming to the hospital once a week and received the sessions …," write "The patient has been coming to the hospital once a week and receiving the sessions" or "The patient came to the hospital once a week and received the sessions," whichever is appropriate
6. Use gender-neutral language. Write "he/she" or "his/her," or adopt the plural and say "they" or "their"
7. Many authors miss to write numbers less than 10 in the word form. One should write "three" and not "3"
8. Use a comma after a prepositional phrase (e.g., "After providing three sessions of group cognitive behaviour therapy to the patient group (n = 60), we …"). This improves the readability of long sentences.

ERRORS DURING SUBMISSION

1. *Beyond the scope:* Articles that are outside the scope of the journal are summarily rejected. In the past year, this has mostly included articles on core psychology topics (perhaps, misled by the name of the journal!) or papers related to advanced statistical modeling for a psychiatric condition that may not interest the majority of our readers
2. *File mess-up:* While uploading, files can get mixed up easily (e.g., not distinguishing between first page file and article file; the same file is uploaded twice). Not infrequently, this happens when multiple tables or figures are uploaded. Also, while submitting revisions, sometimes the older versions are inadvertently uploaded. Including the date or version of the file in its name can be preventive here
3. *Ignored coauthors:* During the submission process, the corresponding author sometimes does not enter the coauthors' details like email and affiliations. This should be avoided because if you do that the coauthors will not get notifications about the submission
4. *Authorship criteria:* The Contributors Form, mentioning the role of each contributor in different aspects of the paper, is frequently not uploaded. This form, or a statement in the covering letter that the authorship criteria as per ICMJE have been met for all the authors, is mandatory for any article with more than two authors. Often, even when the form is uploaded, many coauthors are found to not fulfil the ICMJE criteria, and we are forced to send it back for reconsideration
5. *Keep your mask on:* At submission, the article file should be as deidentified as possible. Often, the authors reveal the name of the institution or city, commonly in the methodology section or the statement on ethical clearance. This would affect the double-blind nature of the peer-review process. Such names should instead be mentioned as X or Y in the submitted manuscript and can be added later post-acceptance. Acknowledgments, if any, should go into the first page file and not the article file
6. *Ticking without looking:* Though the journal has provided a checklist for the authors to fill so that they can know whether they have fulfilled all the requirements of the submission process, apparently, many authors blindly tick all the checkboxes without actually reading the items.

Those who pay sufficient attention to these technical aspects during the submission would get the benefit of a faster review, as no time would be wasted in technical modifications.

Before winding up, on behalf of the entire editorial team and the south zone, we thank all authors, peer reviewers, advertisers, subscribers, readers, and the publisher for their continued support.

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Conflicts of interest
There are no conflicts of interest.

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Guest Editorial

A Critical Look at the Methodology of Epidemiological Studies

Psychiatric epidemiology is the study of distribution and determinants of mental disorders, with the primary aim of understanding the incidence rates.[1] Although there is a long tradition of carrying out epidemiological studies in India, the variation in the methodology is wide. One of the major problems in psychiatric epidemiology is case ascertainment. Unfortunately, "caseness" is still determined by clinical impression based on the symptoms reported or elicited, and there are no objective laboratory or clinical parameters available (fever, blood pressure, etc.) which can be used. To further complicate the matter, current nosology systems suggest that no psychiatric disorder has pathognomonic symptoms. As the "caseness" depends on the assessment method, interpretation of the prevalence figures across studies is dependent on the assessment instrument, that is, whether a general or disorder-specific screening questionnaire or a structured diagnostic instrument was used.

Ideally, a prevalence study should be based on the assessment of all the individuals in a specific population with a structured diagnostic instrument by a mental health professional trained in using the instrument.[2] However, due to practical limitations, prevalence estimates are based on a sample drawn from the target population. Hence, most of the epidemiologic studies have a two-stage evaluation: initially, all the participants are screened on a questionnaire with high sensitivity, and subsequently, those found positive are evaluated using a structured instrument to ascertain the psychiatric diagnosis. It is essential to select an appropriate screening instrument which has been validated against standard diagnostic criteria or structured instruments.

Furthermore, the sensitivity and specificity of the screening questionnaire can influence the prevalence rates. For example, if the study uses a screening instrument with low sensitivity, then it is possible that many cases which may be positive would be considered as not having psychiatric morbidity and excluded from the second stage evaluation. To overcome this, it is suggested that a proportion of the participants found to be negative must be evaluated in the second phase too. Accordingly, factors that can influence the quality of an epidemiological study that uses the two-stage method include variables such as expectation bias (whether the person who was evaluating the participant in the second phase was blind to the results of the screening instrument, and vice versa) and work-up bias (i.e., did the participants found to be positive or negative in the first screening phase have an equal chance to be evaluated in the second stage or not).[3]

Another critical aspect of epidemiological studies is the appropriate adaptation of the instrument for use in the local population. It is suggested that the tool must be appropriately translated into the local language and adapted and/or designed for the particular study setting and population using standard World Health Organization methodology for translation and adaptation.[3] Also, the details of translation and adaptation should be included under study methodology so as to enable the readers to appraise the findings.

Besides the assessment, the prevalence is also influenced by the sampling technique, which may limit the generalizability of the findings. Representative samples should be randomly drawn, with clear mention of the exclusion criteria. *A priori* sample size calculation enables reliable estimates of prevalence. Response rates of at least 80% are considered adequate. Furthermore, the setting of the study too (e.g., whether it is community- or clinic-based) determines the usefulness of its findings.

While reporting prevalence rates, one should be mindful of the differences between point, period, and lifetime prevalence. Most estimates from cross-sectional studies are point prevalence rates, which are understandably lower than the period prevalence rates (e.g., in the past 1 year) and the lifetime prevalence rates. Furthermore, it is always desirable to report confidence intervals (typically 95%) along with the prevalence estimates.

In recent times, many independent researchers have ventured into the area of psychiatric epidemiology from India and the neighboring countries to generate data on mental morbidity and its determinants. This issue of *Indian Journal of Psychological Medicine* covers five such articles. It is exciting to see that these articles

are being covered in a single theme issue for the first time. We critically analyzed these studies, specifically from a methodological point of view, so as to inform future studies.

The study by Joshi *et al*.[4] used the two-stage methodology to evaluate the psychiatric morbidity in Thakali community from Nepal. In the first phase, households were identified using systematic random sampling, and 917 individuals were screened using questionnaires that yielded 12.5% prevalence of probable psychiatric diagnoses. In the second phase, two psychiatrists independently evaluated screen-positive cases and found 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) diagnoses in 6.1% of the participants. The point prevalence of alcohol dependence syndrome was 1.6%, followed by anxiety disorder (1.3%), depression (1.2%), and dementia (0.8%). The strengths of the study include random sampling and use of tools translated to the Nepali language. However, not using a structured instrument to make the diagnosis and limiting only to the screen-positive cases in the second phase might underestimate the true prevalence rates.

Shukla *et al*.[5] evaluated depression among school-going adolescent girls in Barabanki district of Uttar Pradesh. They estimated the required sample size and used multistage sampling and a pretested questionnaire, Kutcher Adolescent Depression Scale (KADS), administered by trained personnel. The point prevalence of depression was 39.7% among 2,187 students screened. The prevalence rates are higher than the findings of several previous studies from India, and their own study[6] done 2 years back had found a prevalence of 18.7% with a cut-off score of 6 in KADS (as against nine in the current study). Wide discrepancies in the prevalence could be attributed to the assessment method (e.g., self-report questionnaire which was actually administered by the researchers, or 1 week of symptoms needed for depression diagnosis in KADS as opposed to 2 weeks in ICD-10). However, it is highly likely that one-time screening actually overestimates the prevalence rates. Hence, all screen-positive cases should have been evaluated using a structured instrument to obtain the true prevalence.

Rathod *et al*.[7] evaluated the prevalence of depression among the elderly population in Aurangabad district of Maharashtra. They had estimated the required sample size, used systematic random sampling, and screened the elderly persons using a translated version of Major Depression Inventory (MDI). Depression was found in 16.7% [95% confidence interval (CI) 13.3–20.6] of the 400 elderly persons screened. Indian studies on the prevalence of depression in the elderly population in the community samples have found, because of methodological differences, widely varying rates ranging from 9% to 61%, thus making a comparison difficult.[8] The median prevalence rates of depression in the elderly population worldwide have been reported to be 10.3% (95% CI 4.7–16.0%).[9] It is possible that the index study overestimated the true prevalence, likely because of not confirming the diagnosis of screen-positive individuals using a structured diagnostic interview. Another reason could be using MDI in the elderly population, which is not validated in this sample.

Saha *et al*.[10] estimated the psychiatric morbidity in adults of Bokultala slum of Bankura district, West Bengal using Bengali version of Self Report Questionnaire. The researchers had estimated the sample size needed and had used a well-validated instrument. One-fifth (21.1%) of the patients had probable psychiatric morbidity, and it was associated with food insecurity as assessed by Household Food Security. The rates are much higher than the current prevalence of 10.56% (95% CI 10.51%–10.61%) found in National Mental Health Survey.[11] The higher prevalence rates could be an overestimation of the true rates as there was no confirmation of the diagnosis using any structured assessment. Alternatively, it is possible that higher rates could reflect the characteristics of the slum dweller sample that may truly have a higher morbidity compared with the general population. Thus, the generalization of the findings may be limited to the studied sample only and not the whole population.

The article by Wangdi and Jamtsho[12] is based on a secondary analysis of the data from the National Health Survey 2012 from Bhutan. The point prevalence of current alcohol use was 30.6% in a nationally representative sample of 31,066 adult participants. Betel chewing was widely prevalent, with more than 90% admitting to its use. In contrast, current smoking was reported in only 4.2% of the study population. The major strength of the study is nationwide sampling using a standard methodology which is likely to generate reliable estimates of current substance use in adults. However, adolescents were not included, and there was no data on problematic substance use.

It is heartening to see that more and more researchers are conducting community-based psychiatric epidemiological studies rather than limited-scope, hospital-based, cross-sectional studies. However, it is pertinent to remember that such studies will be meaningful and generalizable only if appropriate methodology, including representative samples and well-validated assessment instruments, are used. Among

the five studies, except for one, the other groups did not have a mental health professional. Because of this, it is possible that many technical issues related to the selection and adaptation of the instruments are not given due consideration. Ideally, psychiatric epidemiological studies should be carried out with inputs from experts from multiple fields such as epidemiology, statistics, and mental health. Therefore, a collaborative approach is essential to produce good quality epidemiological data which may have the translational potential not only for clinical services but also for policy-level implications as well.

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Review Article

Predominant Polarity in Bipolar Affective Disorder: A Scoping Review of Its Relationship with Clinical Variables and Its Implications

Arghya Pal

ABSTRACT

Background: Bipolar affective disorder (BPAD) is an episodic psychiatric disorder that is associated with considerable morbidity. Psychiatrists have found it difficult to treat the disorder owing to the variety of presentation and variety of challenges in clinical decision-making. To guide the clinicians, the concept of predominant polarity (PP) in BPAD has become important. This review was conducted to understand the definition, epidemiology, relationship with sociodemographic and clinical parameters, and implications of PP in BPAD. **Methodology:** The review was conducted after selecting 17 original research studies from PubMed using appropriate search terms. **Results:** There is no consensus definition of PP. Epidemiological data showed varied results, although most common PP demonstrated in most studies was depressive polarity. The relation between sociodemographic and clinical parameters also lacked uniformity, although certain patterns could be identified in their relationships. The implications of PP in diagnostics, treatment, and classificatory system are discussed. **Conclusion:** PP in BPAD conveys clinically important information that aids a clinician in decision-making. Further studies are required so that we can understand the neurobiological underpinning of the concept.

Key words: *Bipolar disorder, depression, DSM 5, mania, predominant polarity*

INTRODUCTION

Bipolar affective disorder (BPAD) is one of the widely prevalent mental disorders, with a lifetime prevalence of 2.4%.[1] BPAD usually follows an episodic course with the occurrence of recurrent (at least one) manic, hypomanic, or mixed episode in conjunction with depressive episodes, with varying degrees of interepisodic remission. A significant amount of the lifetime of patients with BPAD is spent in suffering from affective symptoms,[2] with a higher chance of time being spent in depressive episodes. The disorder is also highly associated with suicidality and medical comorbidities. However, data from various Asian centers, including India, tend to differ on this front. Studies[3,4] from this region have shown that patients

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with BPAD tend to have a course predominantly characterized by manic episodes. Such patients with predominant manic episodes, though they tend to have a higher chance of syndromal recovery, also have a higher chance of relapse.[5] Thus, it can be said that the course and outcome of BPAD show significant interpatient variation, as a result of which the clinical decision-making in BPAD remains complicated.

For a long time, researchers have been trying to find proxy clinical markers that could reliably predict the future course of BPAD. One such marker was the polarity of the first episode. A retrospective study done on 150 patients with BPAD from India, using the retrospective life chart method, found out that in around 85% of the cases, mania was the first episode and also the most frequent episode.[4] The finding was further supported by another study[6] which also showed that patients presenting with first-episode mania tended to have more manic episodes subsequently. But soon it became apparent that there is a need for better predictive entities. Various studies thus adopted a longitudinal observation of the course of the illness. The initial studies done on patients with BPAD-I and BPAD-II showed an overwhelming depressive presentation.[7,8] But the studies from the tropical regions showed a stark difference and there the manic presentation was more prevalent.[4] The developments in psychopharmacology complemented these findings. Newer classification divided drugs as Class A (stabilizers from above), Class B (stabilizer from below), and Class C (stabilizer from euthymia).[9] Experts speculated that the trick to effective management of BPAD lies in the fact that if we can obtain clinical information that will enable us to reliably predict the course of the disorder, that will allow us to tailor our prophylactic treatment approaches.[10]

The concept of predominant polarity (PP) of BPAD is important in this context. The concept was first described by Angst[11] while describing the course of 95 patients with BPAD followed up for more than 16 years. He classified the patients into three classes: "preponderantly manic," "preponderantly depressed," and "nuclear." However, even before that attempt, Leonhard, in his sample of 117 patients with BPAD, had shown that 17.9% had a predominantly manic presentation, 25.6% had a predominant depressive presentation, and 56.4% had an equivocal presentation. Subsequently, the entity of PP in BPAD has generated sufficient interest in the researchers. This review was hence conducted to collect the available evidence regarding PP in BPAD.

METHODOLOGY

A search was conducted on PubMed to address the following research questions:

1. What has been the accepted definition of PP in BPAD in the literature?
2. What is the epidemiology of PP in BPAD?
3. What is the relation of PP with sociodemographic and clinical parameters of patients with BPAD?
4. What are the implications of determination of PP in BPAD?

A search was conducted on US National Library of Medicine's PubMed/MEDLINE using the following search terms: "Bipolar affective disorder," "Bipolar disorder," "mood disorder," "predominant polarity," "mania," "hypomania," "depression." Appropriate medical subject heading terms (MeSH) were accessed and used. The terms "Bipolar Disorder" [Mesh] AND "predominant polarity" were added to the search builder and articles were accessed. No restriction was placed regarding the time of publication. A secondary search was conducted among the references of the studies, and appropriate studies were accessed.

Study selection

For the purpose of this article, only original articles were included. The abstracts of the studies were initially screened, and full texts of the selected studies were accessed. Only articles whose full text could be accessed and were in English language were included in this review. Overall, 17 article were selected for this review [Figure 1].

RESULTS

Table 1 describes the studies that have been included in this review. The evidence from the included studies has been hereby arranged so as to address the initial research questions:

Definition

One of the major points of contention among the studies included the definition used to classify patients according to PP. The most frequently used criteria were those proposed by Colom *et al*.,[12] where if two-thirds of the episode is of a particular polarity, the PP of that patient is the corresponding PP. This is also considered as the strict criteria or the Barcelona proposal. On the basis of these criteria, the patients can be classified as manic PP (two-thirds of the episode are manic/hypomanic), depressive PP (two-thirds of the episodes are depressive), or indeterminate PP (neither of the polarity has a two-thirds majority). To clarify, if a patient has had three manic/hypomanic episodes and one depressive episode in the lifetime, then the PP of the patient is manic PP. The other criteria that have also been used, considered the relaxed criteria, are when any one of the polarities of the episodes gain a 51% majority, the PP of the patient is the corresponding

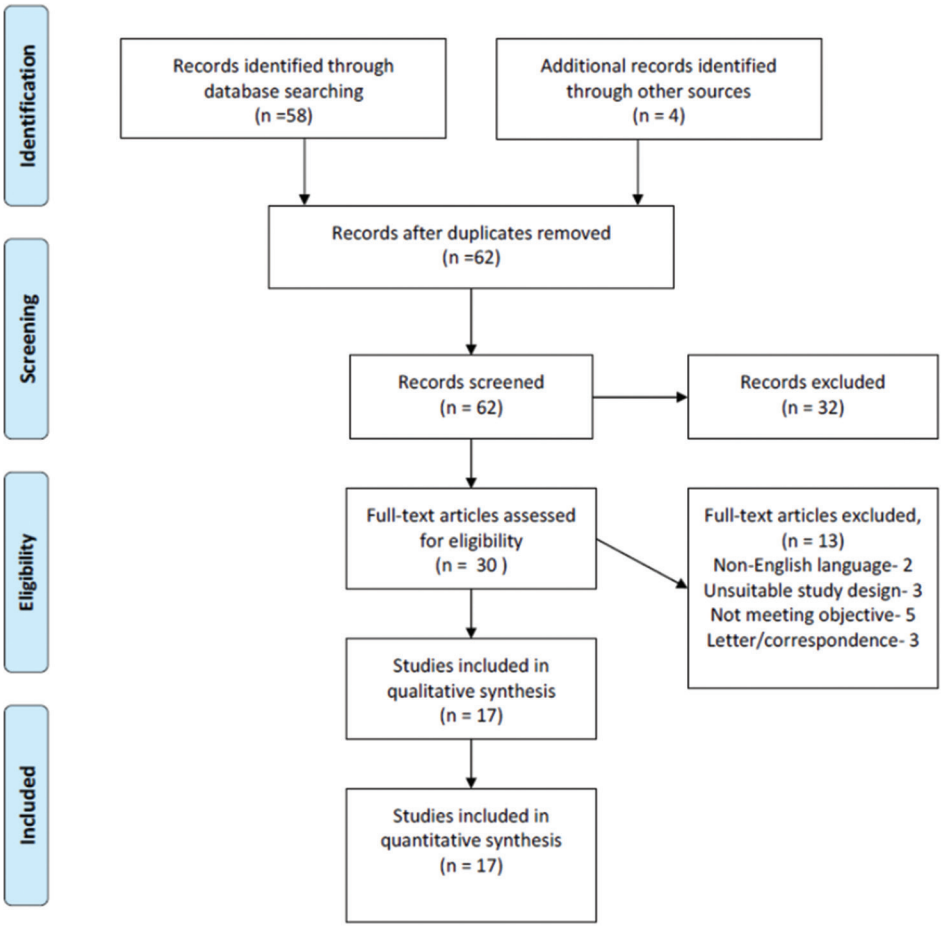

Figure 1: Results of literature search

polarity.[13] This criterion is also called the Harvard index. Evidently, Harvard index has less diagnostic stability when compared with the Barcelona proposal. But the Barcelona proposal is considered by many as too restrictive, where around 38%–44% of the patients could not be assigned a PP.[14] The two sets of criteria were compared in one study[15] which showed that the relaxed criteria allowed more patients to be allotted in either manic PP or depressive PP, but that did not significantly change the predictive information gained.

Another source of debate has been the status of the mixed episodes. Many studies had considered the mixed episodes in the calculation in the denominator, but the mixed episodes were assigned to neither polarity for the sake of calculation according to the previously mentioned criteria.[16] A few other studies[15] had included mixed episodes under the purview of "mania-like episodes" and had calculated accordingly. The Diagnostic and Statistical Manual 5th edition (DSM 5)[17] has removed the diagnostic entity of bipolar I disorder, mixed episode, which required simultaneously meeting criteria for mania and depression and has added a specifier instead "with mixed features." Thus, further discussion in this regard can be considered redundant.

Epidemiology

The epidemiological studies on PP in BPAD have been largely inconclusive, failing to provide us with any trend. A multicentric study conducted across five centers, namely, Barcelona, Catalonia (Spain); Belmont, Massachusetts (USA); Buenos Aires, (Argentina); Cagliari, Sardinia (Italy); and Bundang, Gyeonggi (Korea), including 928 patients with BPAD-I, found that 199 (21.4%) had manic PP, 290 (31.25%) had depressive PP, and 439 (47.3%) had indeterminate PP.[15] An Indian study that included 285 patients with BPAD-I[18] showed that the prevalence of manic PP in the sample was 79.3%, whereas the prevalence of depressive PP was only 13.7%. Another study[16] conducted in Germany in a sample of 336 patients with BPAD-I and BPAD-II showed that 169 (50.3%) had depressive PP and 46 (13.7%) had manic PP, whereas the rest had indeterminate PP. Another study from Barcelona, Spain,[12] conducted on 224 patients with

Table 1: Summary of the studies included in the review

Author	Study design and sample size	Definition of PP	Important findings
Azorin *et al*. (2015)	Cross-sectional (*n*=278)	Barcelona proposal and Harvard Index	79.8% could be subtyped according to PP. Adopting the relaxed criteria made little clinical change. MPP showed more psychosis, rapid cycling, stressors at onset, family history of affective illness, and manic FE. DPP showed more chronic depression and comorbid anxiety
Baldessarini *et al*. (2012)	Cross-sectional (*n*=928)	Barcelona proposal	DPP associated with ECT, longer latency of diagnosis, FE depressive or mixed, more suicide attempts, more Axis-II comorbidity, ever having mixed states, ever married, and female sex. MPP associated with FE manic, higher substance use, higher education, and more family history
Belizario *et al*. (2017)	Cross-sectional (*n*=55, HC=31)	Barcelona proposal	MPP demonstrated greater deficit in comparison to DPP, IPP, and HC.
Colom *et al*. (2006)	Cross-sectional (*n*=224)	Barcelona proposal	60.3% had DPP, 39.7% had MPP; DPP associated more with first depressive episode and higher suicidality. MPP mostly treated with atypical antipsychotics and conventional neuroleptics; DPP mostly treated with antidepressants and lamotrigine
de Asis da Silva (2017)	Cross-sectional *n*=101 [58 euthymic (28 MPP) and 43 in mania (17 MPP)]	Barcelona proposal	BPAD patients in mania had worse insight than those in euthymia, with no effect of dominant polarity. Number of previous manic or depressive episodes did not correlate with insight level
González-Pinto *et al*. (2010)	Prospective (10 years) (*n*=120)	Harvard index	DPP associated with more suicidality, higher family history of affective disorders, and fewer hospitalization. At 10 years, DPP had more episodes, more hospitalization, and more suicidal attempts
Henry *et al*. (1999)	Cross-sectional (*n*=72)	Harvard index	Depressive temperament inversely associated with the number of manic episodes
Janiri *et al*. (2017)	Cross-sectional (*n*=218)	Barcelona proposal	Most common PP in BPAD without SUD was MPP, but the most common in BPAD with AUD and BPD with PSU is DPP
Mazzarini *et al*. (2009)	Cross-sectional (*n*=124)	Barcelona proposal	55% could be classified into PP (DPP two-third, MPP one-third). No difference in affective temperament between MPP and DPP
Nivoli *et al*. (2011)	Cross-sectional (*n*=604)	Barcelona proposal	DPP 23.7%, MPP 18.9%. Females had a higher chance of developing DPP
Nivoli *et al*. (2013)	Cross-sectional (*n*=604)	Barcelona proposal	Treatment of BPAD was in line with PP of the patients
Popovic *et al*. (2014)	Cross-sectional (*n*=604)	Barcelona proposal	MPP associated with more males, younger age, lower age of onset, and more hospitalization. DPP associated with depressive FE, suicidality, and melancholic symptoms. PP of the patients in the sample showed a positive correlation to the PI of the agents being used for the treatment.
Rangappa *et al*. (2016)	Cross-sectional (*n*=604)	Barcelona proposal	MPP associated with manic FE; DPP associated with depressive FE
Rosa *et al*. (2008)	Cross-sectional (*n*=149)	Barcelona proposal	DPP associated with higher latency of diagnosis, depressive FE, lower age of onset, and higher suicidality
Vieta *et al*. (2009)	Post hoc analysis of published RCT (*n*=833)	Barcelona proposal	PP was demonstrable in 46.6% cases (DPP: MPP=2.7:1). Males with MPP showed a better treatment response
Volkert *et al*. (2014)	Cross-sectional (*n*=336)	Barcelona proposal	63.9% had demonstrable PP. DPP and MPP did not significantly vary in terms of PI of the drugs used in its management
Yang *et al*. (2013)	Cross-sectional (*n*=1245 who had more than three admissions)	Admissions of one polarity exceeded the other by two	Patients with predominantly depressive admissions displayed a higher degree of seasonality than patients with predominantly manic admissions

PP – Predominant polarity; MPP – Manic predominant polarity; FE – First episode; DPP – Depressive predominant polarity; ECT – Electroconvulsive therapy; HC – Healthy controls; IPP – Indeterminate predominant polarity; BPAD – Bipolar affective disorder; SUD – Substance use disorder; AUD – Alcohol use disorder; PSU – Poly-substance use; PI – Polarity index

BPAD, showed that 135 (60.3%) had depressive PP and 89 (39.7%) had manic PP.

Factors associated with predominant polarity

The studies have been able to provide evidence that certain sociodemographic and clinical parameters are associated with PP which are summarized in Table 2.

The general trend shown by the studies was that patients with a predominant depressive polarity usually had a higher chance of being female,[15,18,19] though certain other studies[12,13,20,21] could not replicate this finding. These patients usually had a depressive episode as their first episode[15,21,22] and a longer latent period before the disorder is diagnosed. The course of illness in these patients is usually characterized by melancholic symptoms,[12,22] mixed episodes,[12,15] and a seasonal pattern.[12] These patients were likely to have a history of suicidal acts[12,13,15,18,20,22] and receiving electroconvulsive therapy.[15]

The patients with a manic PP tended to have an earlier age of onset[13,15,22] and male gender.[22] However, many other studies failed to show male gender preponderance in manic PP.[12,15,23] These patients also usually had a manic episode as their first episode[15,18,22] and a higher prevalence of substance use.[12,22]

Table 2: Relationship of predominant polarity of bipolar disorder with sociodemographic and clinical parameters

Clinical parameter	Citation
Depressive polarity of first episode	7, 13, 14
Suicidal acts	4, 5, 7, 10, 12, 14
Married	5, 7
Female gender	7, 10, 11
History of electroconvulsive therapy	7
Diagnostic latency	7, 13
Melancholic symptoms	4, 14
Mixed episodes	4, 7
Seasonal pattern	4, 16
Manic predominant polarity	
Younger age of onset	5, 7, 14
Manic polarity of first episode	7, 10, 14
Male gender	14
Substance use	4, 14
Parameters which were noncontributory	
Current age	4, 5, 12, 13, 15
Total duration of illness	4, 5, 12, 13, 15
Episodes/year	4, 5, 12, 13

The relationship between seasonal pattern and predominant polarity

It has already been mentioned in the previous section that patients with depressive PP tended to show a seasonal pattern when compared with patients with manic PP.[12,24] One of the studies which explained this result had followed up an inpatient cohort of 9619 patients with BPAD.[24] The study also showed that other than PP, the polarity of the first episode can also predict the development of seasonal pattern in these patients. A mixed polarity followed by a depressive polarity of the first episode was associated more with the seasonal pattern when compared with a manic index episode.

The relationship between temperament and predominant polarity

A few studies tried to examine the relationship between PP and affective temperament. In their study, Henry *et al*.[25] provided some rudimentary evidence that hyperthymic temperament was positively correlated with a higher number of manic episodes and depressive temperament was correlated with a higher number of depressive episodes. However, the study was not conducted using the concept of PP. Subsequently, Mazzarini *et al*.[20] compared the temperament between patients with BPAD [depressive PP (n = 22) vs manic PP (n = 47)] and unipolar depressive disorders (n = 19). They found that patients with depressive PP or manic PP did not have any significant differences in terms of temperament. One possible reason behind this could be the fact that the study did not have a large enough sample size to garner enough power. But patients with BPAD had significantly less depressive temperament and higher cyclothymic and hyperthymic temperament. Finally, Azorin *et al*.,[26] in their study conducted among 278 patients with BPAD (79.8% depressive PP and 20.2% manic PP), were able to show that patients with manic PP had higher cyclothymic and hyperthymic temperament.

The relationship between substance use and predominant polarity

Substance use disorders and PP have been shown to bear a complicated relationship. A few studies have been able to show that if substance use precedes the first affective episode in BPAD, the possibility of manic PP is higher.[12,22] However, these studies failed to show any relationship between current substance use and PP. In a long-term follow-up study[13] of up to 10 years, the authors demonstrated no significant differences in alcohol and other substance use at baseline. But in patients with manic PP, the frequency of alcohol and other substance abuse decreased significantly when compared with depressive PP. This result was further supported by another study[27] which compared the PP among BPAD patients without substance use (n = 86), BPAD patients with alcohol use (n = 69), and BPAD patients with polysubstance use (n = 63). The authors found that patients with BPAD without substance use tended to have a manic PP, whereas those with alcohol use or polysubstance use tended to have a depressive PP.

The relationship between insight, cognitive functions and predominant polarity

In a study[28] involving 55 euthymic patients with BPAD distinguished in terms of their PP (manic PP 17, depressive PP 22, indeterminate PP 16) and 31 healthy controls, the authors used a neuropsychological battery testing for attention, verbal fluency, planning, and memory. The study showed that patients with manic PP were significantly poor performers in alternating attention, verbal fluency, and delayed memory when compared with all other groups. Patients with depressive PP showed no deficit in any of the tests when compared with manic PP or indeterminate PP. The authors even speculated that the cognitive deficits in BPAD might be related to the polarity of the episodes rather than the number of episodes. Another study,[29] involving 101 patients with BPAD [58 euthymic (28 MPP) and 43 in mania (17 MPP)] showed that PP does not have any bearing on the level of insight.

Polarity index

The concept of PP has led to the advent of the concept of polarity index (PI). PI as a construct is a number that denotes the ability of a drug used in the management of BPAD to prevent episodes of either polarity. It is defined as the ratio of the number needed to treat (NNT) for prevention of a depressive episode to the NNT

for prevention of a manic episode. A PI of more than 1 denotes a superior antimanic property, whereas a PI of less than 1 denotes a superior antidepressive property. Popovic *et al*.,[22] in a sample of 604 patients with BPAD, showed that patients who had manic PP were cumulatively treated with drugs with a higher PI when compared with patients with depressive PP. A similar attempt[16] on a sample of German patients (n = 336) found that the concept fitted poorly to their sample as there was no significant difference in the PI of the regime used in the management of patients with manic PP or depressive PP. The authors speculated that one of the major reasons behind the negative result could have been the fact that many of the drugs which were a part of the study could not be analyzed as there was no PI assigned to them (e.g., antidepressants). In spite of such results, PI remains a useful construct and should be a focus of further research.

The implications of predominant polarity

The expression of PP in a patient with BPAD conveys a substantial amount of information about the patient. Table 2 has already stated the important sociodemographic and clinical parameters that can be associated with certain PP. Colom *et al*.[12] were able to demonstrate that different PPs are associated with very different management goals in BPAD-I and BPAD-II. In BPAD-II, the most common PP is the depressive PP, and the most important target should be to prevent a depressive episode, whereas in BPAD-I, prevention of both manic and depressive episodes is important.

The elaboration of PP in BPAD can also imply a lot of information regarding the treatment choices made for the patients. A naturalistic study[30] has been able to demonstrate that the treatment strategies predominantly used in a cohort of patients with BPAD are in line with their PP. The authors conducted a principal component analysis of a sample of 604 patients with BPAD. The three main prescription patterns that arose were "antimanic stabilization package" for "predominantly manic-psychotic BPAD-I patients," "antidepressive stabilization package" for patients with depressive PP, and "antibipolar II package" including antidepressant monotherapy for patients with BPAD II with depressive PP. The antimanic stabilization package consisted of mood stabilizers (lithium, valproate, and carbamazepine), three atypical antipsychotics (clozapine, risperidone, and olanzapine), and electroconvulsive therapy. The antidepressive stabilization package consisted of lamotrigine and atypical antipsychotics such as quetiapine. The antibipolar II package, on the other hand, comprised the use of antidepressants such as tricyclic antidepressants, monoamine oxidase inhibitors, serotonin selective reuptake inhibitors, and serotonin/noradrenaline reuptake inhibitors. In another sample of 788 patients with bipolar depression,[23] it was found that PP could be established in 367 patients, the majority of whom had depressive PP. Males in this sample with predominant depressive polarity showed a worse outcome to treatment when compared with males with manic PP. This pattern could not, however, be seen among the females in the sample.

DISCUSSION

This review was able to find two sets of definitions for PP. Arguably, the Barcelona proposal has been the more widely used definition so far, but the relevance of the Harvard index remains when the research design does not endorse a diagnostic orphan or "indeterminate polarity." However, the scope for further research to achieve a unifying definition remains. The diagnostic status of the mixed episodes also was a source of ambiguity, much of which has been made redundant following the publication of DSM 5[17] and the anticipated changes according to the beta version of International Classification of Disease 11th edition.[31]

No major trend arose from the epidemiological studies. But certain trends have been speculated in the literature, where authors have found a manic preponderance in tropical areas and a depressive preponderance from the temperate regions.[3] Studies that included patients with BPAD-I also showed a higher prevalence of manic PP.[15] However, that could not be replicated in patients with BPAD-II. Hence, we should potentially invest some efforts to find out any trends, if they exist, and the reason behind that.

The studies reviewed have been able to associate various clinical features with certain PPs. But many of the findings could not be replicated across research. One important reason could be that all the studies did not have the methodological rigor to negate the effect of confounding factors adequately. Another reason could be a recall bias against the non-PP of the clinical course. However, in spite of that, the associated parameters convey important information that could aid decision-making. It is important to recall at this stage that evidence suggests that there is a very close association of PP with the polarity of the first episode. Manic PP has been closely linked with substance use and male gender. Depressive PP is associated with female gender, suicidality, and higher diagnostic latency. Studies also demonstrated that patients with manic PP tended to have higher cognitive deficits when compared with those with a depressive PP. The existing literature also supports the fact that cognitive impairment in BPAD is not just state-dependent and that probably certain cognitive deficits also persist in remission.[32]

The concept of PP and PI also seems to complement each other. Patients with manic PP were usually treated with drugs with higher PI (denoting superior antimanic property) when compared with depressive PP and vice versa. This review points out that we should be guided by the PI of the drugs while choosing appropriate stabilizing medication. However, certain deficiencies need to be corrected. For example, the PI of certain drugs cannot be calculated. The PI of paliperidone cannot be calculated because the NNT for depressive episodes is negative. Again, due to the definition of PI, an agent which is very good in both antimanic and anti-depressive properties cannot be differentiated from an agent which is weak in both antimanic and antidepressive properties. More research is also required to further substantiate the evidence that the prophylactic serum levels of lithium may vary according to the PP of the patients.[33,34] The prophylactic serum level is less for prevention of a depressive episode when compared for a manic episode.

A lot of enthusiasm was there regarding the possibility of PP to be a specifier in the DSM 5 criteria,[35] which has subsided after its publication. Although it has not been accepted as a specifier, the facts that mixed episode has ceased to be an independent polarity and that there has to be a polarity attributed to any episode even with mixed features reiterate the importance of PP. The current belief is indeed that PP remains an important clinical variable in the management of BPAD.[36]

LIMITATIONS

The available literature has not been able to reach a single definition of consensus. As a result, it has been difficult to compare the results of the studies. Although some efforts have been made to find out the differential effects of this variety, further research is required to arrive at a consensus. In the same vein, we need to think about how we should interpret the substantial information that we have been able to accumulate about the so-called "indeterminate polarity." Does it actually represent a distinct group of patients with BPAD? Or is it just a victim of a categorical conceptualization of a construct?

In spite of the concept not being very new, there has been a dearth of large-scale prospective data. It should also be noted that the studies that were conducted are from a few centers. As a result, there is ample scope and requirement of replicating the findings across other centers.

CONCLUSION

In the aftermath of the release of DSM 5, where the concept of PP was disregarded and not accepted as a course specifier, the enthusiasm seems to have died down. This is reflected by the fact that the number of studies subsequent to its release has been sparse. But there is no denying the fact that PP remains a useful construct in our clinical practice. One of the putative reasons behind this apparent disregard may be the fact that we are trying to move toward a psychiatric classification that is less dependent on phenomenology and more on neurobiology. Hence, our further efforts should be focused on developing neurobiological correlates of PP. Further studies should be conducted on genetics, neurobiology, and neuropsychology and to find biomarkers of PP in BPAD.

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Conflicts of interest
There are no conflicts of interest.

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Review Article

Expressed Emotion Research in India: A Narrative Review

Anvar Sadath, Ram Kumar[1], Magnus Karlsson[2]

ABSTRACT

Background: Expressed emotion (EE) is detrimental to patients with schizophrenia, mood disorders, eating disorders and many other psychiatric and neurological disorders. However, majority of the EE literature is generated from the west, and the results of those studies may have limited application in Indian setting. Hence, we conducted this review with the main aim of understanding EE research in India and its potential role in the course and outcome of psychiatric disorders and other chronic illnesses. **Methods:** Using keywords, we performed searches of electronic databases (PubMed, IndMed, PsychInfo, Science-Direct and Google Scholar) and internet sources and a manual search in the bibliography of the retrieved articles to identify potential original research articles on EE in India. **Results:** As per the selection criteria, 19 reports of 16 studies were included and reviewed. The sample size of the EE studies ranged from 20 to 200, and majority of the studies were conducted in psychosis/schizophrenia, followed by obsessive compulsive disorder and epilepsy. Although high EE was found in most of the studies, the impact of EE on illness outcome is not well explored and only two studies examined the relationship between EE and relapse. **Discussion and Conclusion:** There is a dearth of studies on EE, especially its relationship with relapse or clinical outcomes in the Indian context. We recommend more studies in these areas which may be helpful for clinical decisions and advancement of context knowledge in EE.

Key words: *Criticality, emotional over-involvement, expressed emotion, Indian family, psychiatric illness*

INTRODUCTION

Brown *et al*. found that individuals with schizophrenia who live in families with high criticism, hostility or emotional over-involvement, known as expressed emotion (EE), are more likely to relapse than those who live in families low in these characteristics.[1,2]After five decades of research, the EE consistently proved to be detrimental to patients with schizophrenia,[3-5] mood disorders[6,7] and eating disorders.[4,8-10] There is some emerging evidence to support its adverse effects in obsessive compulsive disorder (OCD),[11] first episode psychosis (FEP)[5,12] and substance use disorder.[13,14] Apart from its role as regards the outcome of the illness, the EE itself is an indication of a maladaptive coping of the patients' relatives.[15,16]

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EE is associated with many clinical and demographic variables of patients and caregivers[17] – patients' functioning,[18] employment status, cognitive functions, number of hospitalisations,[19] premorbid adjustment, illness duration,[20] duration of untreated psychosis,[17] number of people living with patients and caregivers' relationship with patients[21] being some of them. EE is also closely associated with the caregivers' stress,[17] psychological distress,[18] burden,[22] coping and negative appraisal.[23] The components of EE such as criticality, hostility and emotional over-involvement arise from differing sources[24] and have varying effects on patients[25] across cultures.[26,27]

Socio-cultural milieu plays an important role in determining EE. The construct of EE is essentially cultural in nature,[28] and different cultural groups tend to be more critical or more emotionally involved because of their cultural background.[29] Although the studies from western culture support the association between high EE and relapse,[30] the data from other cultures is less solid.[27] The relationship between high emotional over-involvement and poor illness outcome is inconsistent, and emotional over-involvement may not be detrimental in all cultures.[26]

In India, family members are the primary providers of support and care for ill family members.[31] More than 90% of chronically mentally ill patients live with their families. The family members provide much-needed care and support including taking day-to-day care, supervising medications, taking the patient to the hospital and looking after the financial needs.[12,32] This active involvement by the family members may occur partly because of the high sense of family responsibility, the value system and family integration, but often is a consequence of an inadequately resourced mental health system.[33] As a result of the increased caregiving tasks, roles and responsibilities, the family caregivers experience significant stress and burden,[12,32] and this could possibly trigger high EE, which in turn may affect the illness outcome. To date, no reviews have specifically examined the potential role of EE in the course and outcome of illness in Indian culture. The previous reviews[26,30] had a very small representation of Indian studies. This review of Indian EE studies tries to answer the following questions.

1. In India, to what extent is EE evident among caregivers/families living with a person suffering from health or mental problems?
2. Does EE predict relapse or worsen the course and outcome of illnesses in an Indian setting?
3. What are the demographic and psychosocial correlates of EE?

METHODS

Potential studies were identified through a combination of electronic database searches, internet searches and bibliographic searches of the retrieved articles. A systematic electronic database search was performed in the PubMed and Science-Direct. Other electronic databases searched were IndMed, PsychInfo and Google Scholar. The last search was run on 7 March 2018. The first author (Anvar Sadath) performed initial literature searches and screening of the articles from the electronic databases and internet sources. The second author (Ram Kumar) performed an additional search to identify whether any potential studies had been left out.

Eligibility criteria

All the peer-reviewed published Indian research studies on EE, conducted among patients and or caregivers/families of persons with a health or mental health problems, from its inception were included. Articles published in the English language, available in an electronic database or other internet sources in the form of journal articles were included. We included all types of studies (i.e. interventional/observational) which quantitatively measured EE as a whole or any of the components of EE such as criticality, hostility, emotional over-involvement, warmth and positive regard.

Search terms

The following search terms, with a combination of three or more from each category, were used to identify the potential studies: expressed emotion, criticality, emotional over-involvement, emotional involvement, hostility, warmth, positive regard *along with* mental illness, mental disorder, schizophrenia, psychosis, mood disorder, anxiety disorder, OCD, eating disorder, dementia, epilepsy, seizures, neurological illness, physical illness, *along with* India, Indian setting, Indian families and Indian culture. The truncation symbol (*) was applied to the basic search word and phrases to get all the associated terms. The Boolean search operator AND/OR was used to combine search terms wherever appropriate.

Data extraction

A data extraction form was prepared after taking into account the review objectives/questions. The variables extracted from the articles included the details of authors, year of publication, aim of the study, participant and setting, study type/design, variables measured, EE instrument and results.

RESULTS

As the results of the search, we obtained 19 eligible EE research reports from 16 studies. A narrative summary of the research reports has been presented in Table 1.

Table 1: Summary of expressed emotion studies in India

Authors	Aim of the study	Participants and setting	Types/design	Variables measures	EE measurement	Results
Baruah *et al*. (2018)[34]	To examine the efficacy of a brief psychotherapeutic intervention as an adjunct to SRIs in OCD	94 OCD patients randomised into brief family interventions or SRI groups OCD clinic, NIMHANS, Bangalore	Randomised controlled trial	Illness severity, family accommodation and EE	Family Emotional Involvement (FEI) and Criticism Scale (FEICS)[35]	High EE (FEI and criticism) t 3-month follow-up, EE declined significantly in intervention group
Reddy and Jagannathan[36] (2017)	To understand the predictors of coping behaviour and EE in persons with alcohol dependence	60 adults with ADS on IP/OP treatment from CIP, Ranchi were randomly recruited	Observational/ cross-sectional	EE coping	Level of expressed emotion scale[37]	Age at first intake of alcohol was associated with perceived EE. It predicted 8% variance in EE
Sadath *et al*. (2017)[17]	To examine how stress and support shape EE in carer's of FEP	71 carers of persons with FEP recruited from inpatient psychiatric units, NIMHANS, Bangalore	Baseline assessment of an intervention study	EE (CC&EOI), stress and social support	Family questionnaire[38]	High EE in bivariate analysis, EE was correlated with age of patients and DUP and inversely with family income. In the regression model, stress increased EE but social support did not influence EE
Sadath *et al*. (2017)[39] [Follow-up study of Sadath *et al*. (2017a)[17]	To assess the effectiveness of group intervention on EE and social support in carers of FEP	71 carers of persons with FEP recruited from inpatient and outpatient psychiatric units, NIMHANS, Bangalore	Quasi-experimental non-equivalent comparison group design	EE (CC&EOI), stress and social support	Family questionnaire[38]	Carers in the intervention group reported a reduction of EE and improvements in social support at 1-month follow-up. However, these benefits were not sustained at the 3-month follow-up
Gogoi (2017)[40]	To assess EE among family members of patients with schizophrenia	100 caregivers of persons with schizophrenia and patients Outpatient department and psychiatric ward of the Assam Medical College Hospital, Dibrugarh	Observational/ cross-sectional	Expressed emotion	Family Attitude Scale[41]	The majority of the family caregivers (79%) had low EE EE was associated with family members' age and marital status (being married). Low EE among those who had onset of illness after 33 years or above
Parija *et al*.[42] (2016)	To explore the burden and expressed emotion in caregivers of schizophrenia patients	40 patients with schizophrenia and their caregivers were recruited from the outpatient department of psychiatry at the Institute of Mental Health and Hospital Agra	Observational/ cross-sectional	Psychopathology, caregiver burden and EE	FEICS[35]	High perceived criticism Unemployment and urban residence were associated with EE
Singh and Singh (2015)[43]	To compare EE and quality of life of the bipolar affective disorder and schizophrenia patients	200 re-hospitalised patients with BPAD and schizophrenia. Study conducted in RINPAS, Ranchi	Observational/ cross-sectional/ comparative design	EE & quality of life	Attitude questionnaire[44]	All the domains of EE were higher among persons with schizophrenia than persons with BPAD
Verma *et al*. (2015)[45]	To understand the influence of perceived EE, stigma and comorbid depression among persons with epilepsy	80 persons with epilepsy recruited from the Neurology Department OPD of AIIMS, New Delhi	Observational/ cross-sectional/ comparative design	Depression Perceived EE stigma	Level of expressed emotion scale[37]	Half of the patients perceived high EE. EE significantly influenced depression and stigma. Patients with high EE were thirteen times more likely to have depression and eight times more likely to have stigma than patients in low EE
Koujalgi *et al*. (2014)[46]	To compare EE in patients with OCD and normal control	30 persons with OCD and 30 age- and sex-matched controls. Samples collected from a medical college at Belgaum, Karnataka	Observational/ cross-sectional/ Case control study	Severity of OCD & EE	Family Emotional Involvement and Criticism Scale (FEICS)[35]	High EE in OCD group All the domains of EE were higher in the OCD group than for the normal control

Contd...

Table 1: Contd...

Authors	Aim of the study	Participants and setting	Types/design	Variables measures	EE measurement	Results
Cherian *et al*. (2014)[47]	To examine the effect of family accommodation (FA) and EE on 1-year naturalistic outcome of OCD	94 OCD patients and their primary caregivers were followed up for 1 year with assessment in every trimester. OPD, NIMHANS	Observational/ longitudinal	Severity of OCD, functioning, work and social adjustment, quality of life, EE, family accommodation and family burden	FEICS[35]	Above average EE Emotional involvement was high as compared to criticism Perceived criticism inversely correlated with relatives' psychological quality of life and over-involvement inversely correlated with psychological, social and environmental quality of life Non-remitters compared to remitters had higher baseline score of EE
Nirmala *et al*. (2011)[22]	To explore the relationship between caregivers' burden and level of expressed emotions by the patients with schizophrenia	35 patients with schizophrenia and their caregivers were recruited form the rehabilitation centre at NIMHANS	Observational/ cross-sectional	Caregiver burden and expressed emotion	FEICS[35]	High EE (high perceived criticism and emotional involvement). EE was not associated with caregiver burden
Singh and Singh (2011)[48]	To study the relationship between EE and behavioural problems among children with epilepsy	30 epilepsy patients (15 boys and 15 girls) attending the Neurology OPD of the Institute of Human Behaviour and Allied Sciences, Delhi	Observational/ cross-sectional	Expressed emotion and behavioural problems	FEICS[35]	Mild-to-moderate EE No significant gender difference in perception of EE
Devaramane *et al*. (2011)[49]	To examine the impact of a brief family-based intervention on carers' functioning, patients' psychopathology and relapse	20 patients with schizophrenia and their primary carers from a medical facility in Udupi, Karnataka	Intervention study. Assessments were carried out at baseline and at 3 months	Psychopathology, EE, burden and coping	FEICS[35]	Above average EE Emotional involvement was high as compare to criticism Significant difference in EE from baseline to 3 months follow-up
Hazra *et al*. (2010)[50]	To study the characteristics of EE in joint and nuclear families	60 key relatives of persons with schizophrenia, each from nuclear and joint families. Outpatient department and schizophrenia clinic of the Central Institute of Psychiatry, Ranchi	Observational/ cross-sectional	EE attitude to mental illness	Attitude questionnaire[44]	There was a significant difference between nuclear and joint families on EE. The key relatives of joint families showed positive attitudes
Shanmugiah *et al*. (2002)[51]	To explore the relationship between OCD and EE in an Indian population	35 consecutive patients with obsessive compulsive disorder, who presented to the OCD clinic at the NIMHANS, Bangalore	Observational/ cross-sectional	Severity of OCD & EE	FEICS[35]	Above average EE EE was not correlated with YBOCS score or any other demographic or illness variables
Wig *et al*. (1987)[52]	To measure the components of expressed emotion among two samples of relatives of first-contact patients from Aarhus (Denmark) and Chandigarh (India) (data derived from a WHO sponsored multicentre study)	24 caregivers from Denmark and 104 samples from Chandigarh, India. The majority of the patients were diagnosed with schizophrenia	Observational/ cross-sectional/ comparative	EE	Camberwell Family Interview	The Danes were very similar in most respects to samples of British relatives, whereas the Indian relatives expressed significantly fewer critical comments, fewer positive remarks, and less over-involvement. Within the Chandigarh sample, city-dwellers were significantly more expressive than villagers of all EE components except over-involvement

Contd...

Table 1: Contd...

Authors	Aim of the study	Participants and setting	Types/design	Variables measures	EE measurement	Results
Leff and Ghosh (1987)[53] Follow-up assessment of Wig *et al*. (1987)[52] study	To examine the relationship between EE and relapse in 1-year follow-up (data derived from a WHO sponsored multicentre study)	93 caregivers of patients, 78 of whom had a centre diagnosis of schizophrenia. 1-year follow-up of patients who had made a first contact with psychiatric services in Chandigarh, North India	Observational/ follow-up assessment of the cohort	EE illness outcome	Camberwell Family Interview	Significant relationship between high EE and relapse However, only hostility was found to be significantly linked with relapse Critical comments and emotional over-involvement showed a tendency to be associated with relapse
Sethi *et al*. (1982)[44]	To compare the attitudes of the key relatives of schizophrenia patients and relatives of disturbed patients (scale validation study)	46 relatives of schizophrenia patients and 41 relatives of disturbed patients hospitalised in a medical college at Lucknow	Observational/ scale validation study	EE	Attitude questionnaire[44]	No group differences in critical comments, hostility, warmth and emotional involvement domains
Trivedi *et al*. (1983)[54] Follow-up study of Sethi *et al*.[44]	To study the attitudes of the key relatives towards the patient on the course of schizophrenia	45 key relatives of persons with schizophrenia who were on OP treatment in a medical college, Lucknow	Observational/ follow-up study	EE, clinical course and social functioning	Attitude questionnaire[44]	There was a trend towards the relatives of the relapsed or continuously ill patients expressing more critical comments, hostility, dissatisfaction and being more emotionally over-involved in comparison with the relatives of symptom-free patients

ADS – Alcohol dependence syndrome; FEP – First episode psychosis; OCD – Obsessive compulsive disorder; EE – Expressed emotion

Study characteristics

As per the selection criteria, 19 reports of 16 studies were included and reviewed. Three studies[17,44,52] produced six reports which included three follow-up reports. The sample sizes of the 16 studies were 64,[34] 60,[36] 71,[17] 100,[40] 40,[42] 200,[43] 80,[45] 30 (30 comparison group),[46] 94,[47] 35,[22]30,[48] 20,[49] 60,[50] 35,[51] 104 (24 comparison group)[52] and 46.[44] Samples across the studies ranged from 20 to 200. Most of the studies were conducted in inpatient/outpatient (IP/OP) units of psychiatry tertiary centres/medical colleges. The highest number of studies were conducted on schizophrenia/psychosis (eight studies),[17,22,40,42,44,49,50,52] followed by OCD (four studies),[34,46,47,51] while two studies were on epilepsy,[45,48] one study was on alcohol dependence syndrome (ADS)[36] and one comparative study was on schizophrenia and bipolar affective disorder.[43] Most of the studies were observational and cross-sectional in nature; however, three studies were longitudinal/follow-ups and three were interventional/experimental. The Family Emotional Involvement and Criticism Scale (FEICS) was the most commonly used instrument to measure EE (eight studies), and all the studies with OCD samples used this instrument. The second most commonly used instrument was the Attitude Questionnaire (four studies).

Majority of the EE studies (13 studies) were conducted in the last decade, while two studies were carried out more than three decades ago. In terms of the professional affiliation of the first/corresponding authors, the majority of the EE studies were conducted by psychiatrists (seven studies), psychiatric social workers (five studies) and clinical psychologists (two studies), while one study each was conducted by researchers with neurology and psychiatric nursing backgrounds.

Extent of EE in Indian studies

Among the 13 studies that examined the EE level, 9 reported above average or high EE among most of the participants[17,22,34,42,43,46,47,49,51] or half of the participants,[45] while 3 studies reported low EE.[40,48,55] A multicentre study with a comparison of Danes and Indian samples suggested that Indian relatives express significantly fewer critical comments, fewer positive remarks and less over-involvement.[55] However, we could not find support for this in the other studies. Although high EE prevailed irrespective of diagnosis, all the four studies in OCD samples demonstrated high or above average EE[34,46,47,51] and five studies on schizophrenia/psychosis reported high EE.[17,22,42,43,49] In the two studies on epilepsy, one reported high EE among half of the study participants[41] while the other reported mild-to-moderate levels.[48]

Role of EE in relapse/clinical outcome

Only two studies examined the relationship between EE and relapse. In this, Leff *et al.*(follow-up study of

Wig *et al*.[52]) followed up 93 patients predominantly schizophrenia diagnosis for 1-year period and found strong evidence for EE – hostility being statistically linked to relapse, while critical comments and emotional over-involvement showing only a tendency to be associated with relapse.[53] Trivedi *et al*. followed up 45 relatives of patients with schizophrenia for a 6-month period and observed a trend among the relatives of relapsed or continuously ill patients to express more critical comments, hostility and over-involvement than relatives of symptom-free patients. However, both of the above studies are quite old, and no recent evidence is available to reach a reliable conclusion on EE and relapse.

Although the direct association between EE and relapse in conditions other than schizophrenia was not examined in the studies, many studies have indicated the detrimental effect of EE on health/illnesses. For example, Verma *et al*.[45] observed that EE significantly influenced depression and stigma, and high EE patients with epilepsy were 13 times more likely to have depression than low EE patients with epilepsy. Another study observed that OCD patients who are not in remission had high baseline scores of EE in comparison to those in remission, which implied a possible EE effect on remission.[47] However, differences exist; one study found that the severity or other illness variables of OCD were not associated with EE.[51]

Demographic and psychosocial correlates of EE

A study that examined the role of demographics in ADS found that higher age at first intake of alcohol significantly increased EE. Other studies have shown that patients' age, duration of untreated psychosis, family income (inversely),[17] family members' age and marital status (being married),[40] type of family,[50] unemployment and urban residence[42] were associated with EE in psychosis/schizophrenia. Sadath *et al*. observed that carers'social support inversely correlated with EE, but could not predict in the regression model, while carers' stress was a significant predictor of EE in FEP.[17] However, another study could not demonstrate any relationship between EE and burden.[22] In OCD, carers' perceived criticism and over-involvement inversely correlated with their psychological quality and with the social and environmental quality of life.[47]

DISCUSSION

Although a fair number of EE studies are available from India, they are largely exploratory in nature and hence many critical aspects were unaddressed. EE as a concept received attention because of its significance in the course and outcome of illnesses, and a substantial body of research has demonstrated that EE predicts clinical relapse in a number of distinct psychiatric disorders.[56] For example, a meta-analysis of 27 studies confirmed that EE significantly predicts relapse in schizophrenia.[30] EE also correlated with relapse in bipolar 1 disorder[57] and substance dependence,[58] predicted outcome in anxiety disorders[59] and explained pathology in eating disorder.[10] However, in this review it was found that recent Indian studies have not examined the predictive validity of EE on relapse in any illnesses. Also, not many studies have examined the role of EE on the course of illnesses. While EE was observed to be high in most of the studies reviewed here, the potential impact of EE on illness was not examined well. We recommend to conduct studies to examine the role of EE in predicting relapses and in illness severity in this culture. Such studies need to be longitudinal/prospective in nature so that the influence of EE on the course of the illness can be measured accurately over the time period.

Western studies have also examined the effects of EE in many chronic physical/neurological disorders like cancer,[60,61] dementia[62,63] and epilepsy.[64,65] Although we have two published EE studies on epilepsy, many important aspects seem unaddressed. Evidence from the west suggests that high EE is associated with significantly higher seizure frequency and that high criticism resulted in poor drug compliance, while positive EE, such as warmth, resulted in better clinical and pharmacological compliance in seizure disorders. High family criticism correlated with higher depression and anxiety among the patients.[64] A recent meta-analysis of EE studies on dementia found that relatives of those with high EE have increased depression and burden, and they are more likely to attribute the patient's problems to factors that are personal and controllable by the patient. Many of these findings have significance for service delivery for patients and caregivers. However, we do not have relevant literature from India to verify these findings and we suggest that future research should focus on this area.

Although EE includes criticality, emotional over-involvement, hostility, warmth and positive regard, the most commonly measured EE components are the first three (negative EE). Positive EE (warmth and positive regard) is often less emphasised in the literature. This is because of the detrimental effects of negative EE on the course and outcome of the illness. Though positive EE is expected to act as a protective factor, not many studies have been done on these aspects. However, we think it might be very relevant to study the positive EE in Indian culture because of the critical role and support of the families in the care and treatment of patients. This might be helpful for deciding strength-based approaches to treatment.

Finally, all the negative EE components need not necessarily be detrimental to patients. Criticality and emotional over-involvement can have varying effects on patients across cultures. A systematic review of 34 studies concludes that the relationship between high emotional over-involvement and poor outcome is inconsistent across cultures.[26] The construct and measurement of emotional over-involvement itself are culture-specific. The effect of high emotional over-involvement could be moderated by a high warmth and high mutual interdependence in kin relationships.[26] Carers with high emotional over-involvement have attribution styles similar to those of low EE relatives. They may attribute a patient's illness to external factors the patient cannot control, as opposed to hostile and critical relatives who consider the illness as internal and controllable by the patients.[66] However, emotional over-involvement does more harm to the relative as it increases stress and the burden of care.[24] Thus, we also recommend for Indian studies examining differential predictors of critical comments and over-involvement of the families caring for patients.

CONCLUSION

EE was found to be high in most studies. The impact of EE on illness outcome is not well explored in Indian studies, as only two studies examined the relationship between EE and relapse. Hence, we recommend more studies to address this gap and to build evidence base in this area.

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Conflicts of interest
There are no conflicts of interest.

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Original Article

Mental Disorders in Ethnic Community: A Prevalence Study from Thakali Community of Nepal

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ABSTRACT

Introduction: Mental disorders are common and major source of disability around the world. Though Nepal lacks national data on the prevalence of mental disorders, many studies have been conducted in specific groups of people. The Thakali community is one of the indigenous communities of Nepal. We aim to look at the prevalence of mental disorders in this group. **Materials and Methods:** This is a cross-sectional study with multiphasic sampling conducted in the Thakali community in six distinct geographical regions of Nepal. The first stage was a household survey done by field researchers using screening questionnaires to detect a probable diagnosis of mental disorders. The second stage was detailed clinical assessment and diagnosis (ICD-10) by two independent psychiatrists. **Results:** Among the 917 participants, after the first phase, a probable diagnosis (as per the screening questionnaire) was found to be 12.5%. After the psychiatrists' assessment and addition of already diagnosed cases, the prevalence was 6.1%. In both the cases, prevalence of alcohol use disorder was comparatively higher (34.8% and 31.9%, respectively). **Conclusion:** Despite many shortcomings, this study has provided an estimate of the prevalence and pattern of mental disorders among an indigenous Nepalese community. We emphasize the need of validation of tools for Nepal and estimation of prevalence at the national level.

Key words: *Ethnic community, mental disorders, Nepal*

INTRODUCTION

National surveys around the world have found that mental disorders are a major and common source of disability.[1] The Global Burden of Disease Study 2010 (GBD 2010) estimated that mental, neurological, and substance use disorders ranked 5th among the diseases contributing to the global burden.[2] A meta-analysis on prevalence studies of common mental disorders from 1980 to 2013 found a 12-month prevalence of 17.6% and a lifetime prevalence of 29.2%.[3] The prevalence data on mental disorders from the Asian countries are sparse and heterogeneous.[4] When we look at the two neighboring countries of Nepal, the prevalence of mental disorders is found to be comparable.[5] A recent nationwide survey done in India found the lifetime prevalence of mental disorders to be 13.9% and current prevalence to be 10.5%.[6] Similarly, the World Mental

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Health Survey initiative showed the prevalence of mental disorders in China to be 13.2%.[7]

Nepal lacks national level prevalence data on mental disorders. A few studies have been conducted in specific communities and groups of Nepal for generating prevalence data.[8-10] In the similar lines, a prevalence study in one of the indigenous communities, Thakali Community, was planned.[11] Numerically, it is a very small group and "Kendriya Thakali Sewa Samiti,"[12] a representative organization of this community, has a household list of the entire Thakali population. As per the data of National Census 2011, the current population of this community is 13,215.[13] The main aim of current study was to look at the prevalence of mental disorders in this genetically homogenous group of people.

MATERIALS AND METHODS

The study was conducted in the Thakali community of Nepal. The majority of this population reside in six geographical regions: central hills, central inner terai, western mountains, western hills, western terai, and mid-western/far-western region. This covers six districts of Nepal. The national household list was categorized based on 4 major clans and further subcategorized based on 39 subclans. Systematic random sampling was done within this list to obtain the specified households. All individuals aged 16 and above from each of the chosen households were included in this study.

Two experienced field interviewers were trained in interview techniques and survey questionnaires. Before starting the field work, interviews were done on the sample population under supervision for quality assurance. Additionally, a member of the Thakali community was assigned as a facilitator to assist field interviewers. The study was conducted in two phases: first, the household screening (door-to-door visit) of sample household was done by field interviewers. Each interview was scheduled for about 20 minutes. Second, detailed clinical interviewing of screen-positive individuals was done by two psychiatrists independently, and a clinical diagnosis (if present) was made on the basis of the ICD-10.[14]

Tools used

Modified Mini Screen

22-item scale that uses a set of "gateway" questions which relate to signs of distress that may be attributed to a diagnosable psychiatric disorder. The questions are based on threshold criteria found in the Diagnostic and Statistical Manual IV, the Structured Clinical Interview for Diagnosis, and the Mini International Neuropsychiatric Interview.[15]

CAGE Adapted to Include Drugs

Four-item screening instrument that is a modified CAGE screening questionnaire for other drugs in addition to alcohol. CAGE questionnaire, the name of which is the acronym of four questions, is described as follows:[16]

1. Have you ever felt you needed to cut down on your drinking?
2. Have people annoyed you by criticizing your drinking?
3. Have you ever felt guilty about drinking?
4. Have you ever felt you needed a drink first thing in the morning (eye-opener) to steady your nerves or to get rid of a hangover?

Patient Health Questionnaire-15

Somatic symptom severity scale used to screen for somatic symptoms, which are strongly correlated with somatoform disorders, depression, and anxiety disorders.[17]

Functional Activities Questionnaire

Screening instrument used for the detection of cognitive impairment in older adults. This questionnaire was administered only to those participants above 50 years of age.[18]

The abovementioned tools were translated into Nepali language using WHO method of tools translation.[19] Written informed consent was taken from each participant and the identity of the subjects was kept confidential. Ethical clearance was obtained from the Nepal Health Research Council, Reg. No. 39/2013.

RESULTS

A total of 917 participants were enrolled during the screening phase. Sociodemographic profile of the participants is shown in Table 1. The maximum age was 95 and the minimum was 16 years, with a mean age of 45.37 ± 18.48 years. The male-to-female ratio was almost one. Maximum numbers of respondents were married (69.9%), and the rates of divorce and separation were very low (0.5% and 0.9%, respectively). The majority of participants had a primary (22.2%) and secondary level (46.5%) of education and 31.8% of participants had their own business. Among the 455 female participants, 30.76% were housewives.

A total of 115 participants were screen positive and were subjected to the second phase of the study where two independent psychiatrists did the detailed clinical evaluation. As seen in Table 2, the most prevalent disorders at the time of screening were alcohol-dependence syndrome and depression, followed

Table 1: Sociodemographic profile of participants

Variables	*n* (%)
Sex	
Male	462 (49.6)
Female	455 (50.4)
Residence	
Urban	663 (72.3)
Rural	254 (27.7)
Marital status	
Unmarried	203 (22.1)
Married	641 (69.9)
Divorced/Separated/Widowed	73 (7.9)
Education	
Illiterate	99 (10.8)
Just literate	107 (11.7)
Primary	204 (22.2)
Secondary	426 (46.5)
Graduation and above	81 (8.8)
Occupation	
Agriculture	123 (13.4)
Housewife	140 (15.3)
Service	86 (9.4)
Business	292 (31.8)
Student	94 (10.3)
Others	182 (19.8)

Table 2: Screening and final diagnosis

Disorders	Probable diagnosis *n* (%)	Final diagnosis *n* (%)
Anxiety disorder	23 (20.0)	12 (25.5)
Depression	31 (27.0)	11 (23.4)
Psychosis	0	1 (2.1)
Alcohol-dependence syndrome	40 (34.8)	15 (31.9)
Dementia	21 (18.3)	8 (17.0)
Total	115	47

by anxiety disorder. It is interesting to see that dementia had a prevalence of 18.3%. After the second phase, the number of respondents with mental disorders was 47 as compared to screening positive number of 115. However, the ratio of the percentages of individual mental disorders did not change significantly. Among all the respondents (918), 9 individuals were already diagnosed with some kind of mental illness. Hence, the prevalence rate of mental disorders was calculated to be 6.1%.

DISCUSSION

We conducted this study in Thakali community, which is one of the indigenous groups of people living in Nepal with an estimated population of less than 15,000. We took a sample size of 917, and the sex ratio was 101.54 compared to the national sex ratio of 94.2. The number of participants living in the urban area was more as compared to rural area in our study. This finding is significantly different from the finding of national population from 2011 Census of Nepal that shows the population residing is rural area to be much higher than urban area.[13] Only 10% of the participants were illiterate and maximum number of individuals were involved in business, indicating the better social status of this community as compared to other indigenous communities of Nepal.

The screening done using the questionnaires gave a probable diagnosis of the mental disorders. The overall prevalence of probable mental disorders was 12.5%, and the prevalence of the disorders was in the descending order: alcohol-dependence syndrome, depression, anxiety disorder, and dementia. These prevalence rates are low as compared to other surveys conducted in different countries.[3] However, it is comparable to the recent mental health survey of India, where the cross-sectional prevalence was 10.5%.[6] The point to note here is that cognitive impairment was not included in the survey of India.

When the second phase was completed, the prevalence was way lower (6.1%) than expected. Compared to the 12-month prevalence rate of 30% reported in National Co-morbidity Survey,[20] the prevalence is very low, in both the phases, in this community. The prevalence is also low compared to that reported in countries like Chile,[21] China,[22] and Bangladesh.[23] One of the reasons for this lower prevalence could be under-reporting of problems as a result of stigma associated with mental illness in lower income countries like Nepal.[24-26] Similarly, it might also be possible that people of the Thakali ethnic group suffer from much less number of mental disorders as compared to other communities, due to some underlying genetic factors. One important aspect to note in our study is the decrease in prevalence during the time of the psychiatrists' assessments when compared to the questionnaire-based first phase. Most of the prevalence studies conducted throughout the world are done on the basis of questionnaires administered by trained individuals. One aspect that cannot be ruled out while discussing this disparity is the validity of the questionnaires for this study population and the method of application of questionnaires by the trained data collectors.

The major strength of our study is the use of a two-stage procedure, that is, the screening and further assessment by psychiatrists to confirm the diagnosis. The homogenous nature of the sample is another strength. This is the only study that has been conducted in the Thakali community to assess the prevalence of mental disorders, and this might lead the way for further studies in this genetically homogenous group.

There are some limitations of the study as well. First, the data are cross-sectional and we did not measure the longitudinal mental health status of the sample. Second, the sample population was limited to one specific ethnic group. Hence, the findings may not be generalized to the entire population of the country, without similar studies in other ethnicities. Third, in the second phase, we interviewed only the screen-positive cases for confirmation of final diagnosis. Hence, the total number of false negatives in the sample population could not be ascertained. Thus, it was not possible to assess the sensitivity of the screening questionnaires, making it difficult to conclude whether they can be used or not for a national level mental health survey. Finally, the screening instruments appear to be very poor in detecting cases with psychosis, as none of the probable diagnoses after the screening phase included psychoses. But after the second phase, a case of schizophrenia was confirmed among the screened population which had gone undetected earlier.

CONCLUSION

Despite many shortcomings, in the current scenario of a dearth of any scientific baseline data regarding mental disorders in our country, this study has provided an estimate of the prevalence and pattern of mental disorders among an indigenous Nepalese community. The prevalence of mental illness in the Thakali is less as compared to the prevalence studies done throughout the world. We believe that this study will serve as a guide for further large-scale studies regarding mental health in Nepal. We recommend the validation of the tools in the local language and further large-scale studies with a stronger methodology to determine the exact prevalence at the national level.

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Original Article

Prevalence of Depression in an Urban Geriatric Population in Marathwada Region of Western India

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ABSTRACT

Background: Depression is a common problem in the elderly but is often undetected and ignored as a medical problem, leading to poor quality of life. This community-based study was conducted to know the burden and risk factors of depression among the elderly. **Subjects and Methods:** The survey was done in 2015 in Maharashtra, India as a part of an initiative addressing community mental health needs of the elderly. Total 400 elderly, aged 60 years and above, were selected through a house-to-house survey, using probability proportional to size method, and interviewed for depression using Major Depression Inventory Scale (MDI Scale), and other potential risk factors using a pretested questionnaire. **Results:** A total of 16.75% elderly had depression. Increasing age (Spearman's rho = 0.112, $P = 0.026$), illiteracy (OR = 2.23; 95% confidence interval, CI 1.22–4.07), lack of sleep (OR = 2.97; 95% CI 1.73–5.09), and leisure time spending alone (OR = 0.57, 95% CI 0.34–0.98) were found to be associated with depression. However, on multivariate analysis, only sleep duration <6 h was found to be associated [AOR = 2.6; 95% CI 1.4–4.6]. **Conclusions:** There is a considerable burden of depression in the elderly, reemphasizing the need for regular screening for this disorder and its risk factors.

Key words: *Depression, geriatric, prevalence*

INTRODUCTION

Ageing is a normal process which is associated with physical, social, and psychological changes.[1] As the age advances, there is increased morbidity and functional loss. Various life events experienced by the elderly population can greatly impact their psychological status, making them more prone to depression.[2] No wonder depression is the leading mental health problem among the elderly.[3] It refers to a range of mental problems characterized by loss of interest and enjoyment in ordinary experiences, low mood,

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and associated emotional, cognitive, physical, and behavioral symptoms.[4] Currently, depression is the third leading contributor to the global disease burden but will rise to the first place by 2030.[4] The Global Burden of Disease projections show that depression will be the single leading cause of Disability Adjusted Life Years by 2020 in the developing world.[5]

Depression in the elderly is yet to receive its due recognition in India. Few community-based studies have been conducted in India so far to address this issue.[5] Several studies in the elderly population have examined the prevalence of depression across India, with results ranging from 6% to 62%. Methodological differences may account for this variability.[6,7] Studies to assess the depression among the elderly population have not been done in the Marathwada region . Keeping in mind the different problems of the elderly, the need was strongly felt to assess the prevalence of depression and its determinants among the elderly, to plan regionally sensitive intervention strategies for engaging, and empowering the elderly against depression. The objective of this study was to assess the prevalence of depression in an elderly population of Aurangabad.

SUBJECTS AND METHODS

This cross-sectional survey was done from October 2014 to March 2015 as a part of an initiative of addressing community mental health needs of the elderly. The urban field practice area of Department of Community Medicine, Government Medical College and Hospital, Aurangabad, Maharashtra. Figure 1 includes seven administrative wards spanning a total population of 72,967 and a geriatric population of 6676.[8] For sample size calculation, we estimated a sample size of 409 subjects for an estimated prevalence of 41.1%, 5% precision, 95% confidence level, and 10% contingency.[9] We thus planned to recruit 59 subjects from each ward by systematic random sampling. A landmark was identified in each ward where a bottle was rotated, and the house pointed by mouth-end of the bottle was selected as the first household. Thereafter, every 20th house was visited by left-hand rule, and all elderly in the household were recruited until the required sample size from that ward was obtained. Institutional Ethical Committee approval was obtained before the start of the study.

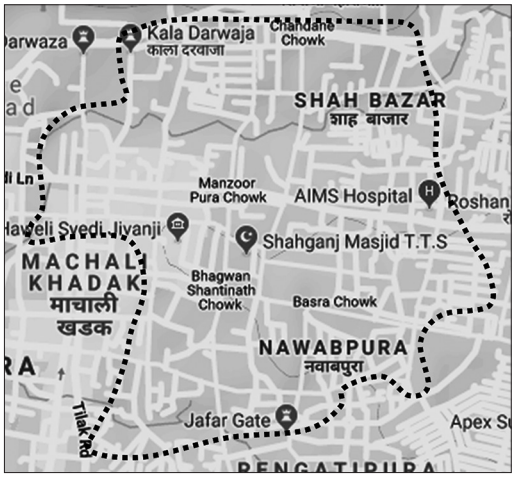

Figure 1: Map of urban field practice area of the medical college

Inclusion criteria were age above 60 years and being resident of the area for more than 6 months.[10] Those who had an inability to answer the assessment questionnaire due to serious hearing problems or severe communication disorder, those who refused to participate in the study, and guests visiting the household were excluded.

After taking oral informed consent and explaining the nature of this study, each study subject was moved to a separate room in their home. They were interviewed with pretested and predesigned questionnaire, asking for the demographic profile, depression, and risk factors.[11,12] The potential risk factors were identified from various previous studies and reviews.[2,6,13-15]

Depression was assessed using Major Depression Inventory (MDI) Scale, which is a brief six-point rating scale with a score ranging from 0 to 50 and a score equal to or above the cut-off of 20 indicating depression.[16] This questionnaire was translated to Marathi and Hindi languages, and back translation was done to check the validity of the questionnaire.

When the elderly participant had difficulty in understanding the question, each question was repeated till he/she got the correct meaning of the question. Each interview was completed in approximately 30–40 min. Those reporting higher depression scores were advised to report to the hospital for complete psychiatric evaluation.

The data were collected, compiled, and analyzed using Statistical Package for Social Sciences version 20. Data were described using frequencies, percentages, means, and standard deviations to summarize characteristics of the study subjects. Association between two categorical variables was analyzed using Chi-square test, odds ratio along with 95% confidence interval (CI). Spearman rank correlation coefficient was used to determine the association of age with the level of depression. Binary logistic regression was performed to estimate unadjusted odds ratios of potential risk factors. Multivariate logistic regression was performed to control confounders. The level of significance was set at $P < 0.05$ for all analyses.

RESULTS

A total of 400 subjects were interviewed; rest nine either did not give consent or were not found at home after two more repeated visits, and the response rate is 97.8%. A total of 62% were females and 38% were males. Two-third of the participants was in the age range of 60–69 years. And 55% were Muslims and 45% were Hindus. While 35.8% were living in nuclear families and 97.75% were living with either spouse or children or other relatives. Majority of the elderly subjects were in socioeconomic class IV. And 61.75% were illiterate and 83.8% were unemployed [Table 1].

Their median depression score was 7.5 inter quartile range was 10 (IQR 10), ranging from a minimum of 2 to a maximum of 27. Of the 400 participants interviewed, 67 (16.75%) suffered from depression (MDI score ≥20). There was a positive correlation between depression scores and age (Spearman's rho = 0.112, P = 0.026), i.e., as age increased, the severity for depression also increased.

Geriatric depression had a significant association with illiteracy (OR = 2.2; 95%CI: 1.2–4.1), not doing any exercise (OR = 2.4; 95%CI: 1.03–5.3), sleeping less than 6 h (OR = 3.0; 95% CI: 1.7–5.1), and lesser leisure time spending with others (OR = 1.7, 95% CI: 1.02–2.9). On multivariate analysis, only the duration of sleep <6 h (AOR = 2.6; 95%CI: 1.4–4.6) was found significant which independently increased the risk of depression. Remaining all factors like sex, marital status, type of family, living condition, financial dependency, low socioeconomic status, illness in present and in past, habit of skipping meals, habit of taking breakfast, habit of smoking, alcohol consumption, or tobacco chewing were not found as significant risk factors for depression [Table 2].

Table 1: Sociodemographic profile of the study population (*n*=400)

	Frequency	Percentage
Age distribution (in years)		
60-69	275	68.8
70-79	98	24.5
>80	27	6.8
Sex		
Male	152	38.0
Female	248	62.0
Religion		
Muslim	220	55
Hindu	180	45
Marital status		
Married	263	65.8
Widow/widower	137	34.3
Type of family		
Nuclear family	143	35.8
Joint family	34	8.5
Three generation family	216	54.0
Extended family	7	1.8
Coliving with ….		
Living alone	9	2.3
Living with spouse, relatives, children, etc	391	97.75
Socioeconomic status (Modified Kuppuswamy Scale)		
II – Upper middle	8	2
III – Lower middle	79	19.75
IV – Upper lower	259	64.75
V - Lower	54	13.5
Education		
Illiterate	247	61.75
Literate	153	38.25
Occupation		
Unemployed	335	83.8
Working/employed	65	16.2
Comorbid condition		
Illness in past	44	11
No illness in past	356	89
Dietary habit		
Vegetarian	44	11
Mixed	356	89
The habit of taking breakfast		
Not having the habit of taking breakfast	256	64
Having the habit of taking breakfast	144	36
The habit of skipping a meal		
Skip meal	84	21
Do not skip a meal	316	79
Do exercise		
Yes	79	19.8
No	321	80.3
Duration of sleep		
Sleep ≥6 hours	285	71.25
Sleep <6 hours	115	28.75
Leisure time spending with…		
Spending alone	219	54.8
Spending with others	181	45.3

DISCUSSION

There is a growing burden of mental morbidity in geriatric population worldwide.[17] In this study, we found the prevalence of depression as 16.75%. This is a little higher than the depression estimated by Sengupta and Benjamin in Ludhiana (8.9%)[5] and Chauhan *et al.* in Telangana (9.3%).[18] However, many researchers have also reported a higher prevalence of depression like 39.04% in Surat by Vishal *et al.*,[15] 41.7% in Maharashtra by Goswami *et al.*[19] and 42.7% in Tamil Nadu by Sinha *et al.*[14] Various Indian studies have reported depression prevalence ranging from 6% to 62.2%.[6,7] Barua *et al.*, in a meta-analysis, reported a median prevalence of 21.9% for depression in India.[13] The various reasons for the difference in estimates could be the use of different scales and sampling methods.

Table 2: Association of depression with various risk factors

Variables	Depression absent (*N*=333)*	Depression present (*N*=67)*	Unadjusted odds ratio (95%CI)**	*P* value	Adjusted odds ratio (95% CI)†	*P* value
Female gender	206 (61.9)	42 (62.7)	1.036 (0.60-1.78)	0.89	0.967 (0.47-1.97)	0.93
Widow/widower	116 (34.8)	21 (31.3)	0.854 (0.49-1.50)	0.58	3.461 (0.55-21.66)	0.19
Nuclear family	115 (34.5)	28 (41.8)	1.361 (0.79-2.33)	0.26	1.219 (0.67-2.22)	0.52
Living with spouse	201 (60.4)	46 (68.7)	1.439 (0.82-2.52)	0.20	5.295 (0.88-32.05)	0.07
Illiterate	196 (58.9)	51 (76.1)	2.228 (1.22-4.07)	**0.008**	1.835 (0.91-3.68)	0.88
Financially dependent	276 (82.9)	59 (88.1)	1.523 (0.69-3.36)	0.29	1.301 (0.55-3.06)	0.55
Low SES	78 (23.4)	9 (13.4)	0.507 (0.24-1.07)	0.07	0.683 (0.29-1.57)	0.37
Presence of current illness	166 (49.8)	31 (46.3)	0.866 (0.51-1.47)	0.59	0.955 (0.53-1.71)	0.88
Presence of past illness	35 (10.5)	9 (13.4)	1.321 (0.60-2.89)	0.49	1.358 (0.56-3.27)	0.49
Skip meals	75 (22.5)	11 (16.4)	0.676 (0.34-1.35)	0.27	0.828 (0.37-1.87)	0.65
Do breakfast	124 (37.2)	20 (29.9)	0.717 (0.41-1.27)	0.25	0.983 (0.51-1.89)	0.96
Don't do any exercise	261 (78.4)	60 (89.6)	2.364 (1.03-5.26)	**0.04**	1.953 (0.80-4.76)	0.14
Habit of smoking	17 (5.1)	6 (9.0)	1.828 (0.69-4.82)	0.25	1.688 (0.49-5.71)	0.39
Habit of alcohol consumption	5 (1.5)	1 (1.5)	0.994 (0.11-8.65)	1	0.424 (0.03-5.82)	0.52
Habit of tobacco chewing	40 (12.0)	9 (13.4)	1.137 (0.52-2.47)	0.75	1.130 (0.47-2.71)	0.78
Duration of sleep <6 hours	82 (24.6)	33 (49.3)	2.971 (1.73-5.09)	**0.00004**	2.587 (1.44-4.64)	**0.001**
Leisure time spending with others	143 (42.94)	38 (56.71)	1.742 (1.02-2.94)	**0.04**	1.594 (0.88-2.85)	0.12
Time spent for leisure Activity <2 hours	182 (54.7)	45 (67.2)	1.697 (0.98-2.95)	0.059	1.789 (0.98-3.27)	0.058
Skip meals	75 (22.5)	11 (16.4)	0.676 (0.34-1.35)	0.27	0.828 (0.37-1.87)	0.65

*Figures in parentheses represent column-wise percentages. †Figures in parentheses represent 95% CI. CI: Confidence Intervals; SES: Socioeconomic status

There was a significant association of depression with increasing age (Spearman's correlation coefficient = 0.112, $P = 0.026$) and illiteracy [OR = 2.23, 95%CI (1.22-4.07)]. While many researchers like Sengupta and Benjamin[5] Swarnalatha[20] Barua *et al.*,[21] Rajkumar *et al.*,[22] and Jain *et al.*[23] have reported similar risk of depression with increasing age, Papadopoulos *et al.*[24] showed no significant relationship between age and prevalence of depression. The association of depression with age can be due to organic diseases but can also be due to exogenous factors as advancing age is often accompanied by loss of social support systems due to the death of the spouse or siblings, retirement, or relocation of residence.[25]

Illiteracy was found to be an independent risk factor for depression on bivariate analysis [OR = 2.228,95% CI (1.22-4.07)] but not on multivariate analysis [AOR = 1.835,95% CI (0.91-3.68)]. Others like Goyal *et al.*[26] and Jain and Aras[23] found that prevalence of depression was higher in illiterates ($P < 0.05$). A greater protective effect against mental disorders may be linked to higher education. Those from educated backgrounds are more likely to have healthy lifestyles and the resources to intellectually support them that promote mental health. Higher education can also be considered helpful in attaining more fulfilling careers and higher wages, thus leading to lower risk of depression. Education can be linked to better economic resources and a work environment that can mitigate financial stress, support healthy lifestyles, and hence promote mental health.[27]

Although lesser physical exercise showed significantly higher depression on bivariate analysis (OR = 2.364;

95% CI 1.03–5.26), on multivariate analysis no significant association was found [AOR = 1.953 (95% CI 0.80–4.76)]. Hua *et al.*,[28] Barcelos-Ferreira *et al.*,[29] Michalsen *et al.*,[30] and Strawbridge *et al.*[31] supported the protective effects of physical activity on depression for older adults. However, the mechanisms underlying the antidepressant effects of exercise remain unclear. Several credible physiologic and psychological mechanisms have been described, such as the thermogenic hypothesis, the endorphin hypothesis, the monoamine hypothesis, the distraction hypothesis, and the enhancement of self-efficacy. However, there is little research evidence to either support or refute most of these theories.[32-34]

Another important aspect would be the dose of exercise (duration) which may be the reason why the subjects in our study who reported doing exercise did not have a significantly lower depression.

Another important risk factor was a lack of adequate sleep. We found that depression was more among those who were having <6 h sleep at night (AOR = 2.587, 95% CI = 1.44–4.64). These results are supported by Dasgupta *et al.*[35] Paudel ML *et al.*[36] demonstrated that in community-dwelling older men, level of depressive symptoms had a strong, graded association with sleep disturbances. Livingston *et al.*[37] have also revealed that sleep disturbance was associated with current and future depression. Some researchers have also suggested that a diagnosis of depression in the absence of sleep complaints should be made with caution. Sleep disturbance is one of the key and often presenting symptom of depression.[38]

We did not find any significant association of depression with female gender, marital status, nuclear family, coliving, financial dependency, socioeconomic status, leisure time spending with others, current illness, eating habits, smoking, alcohol, or tobacco chewing.

A strength of the current study is the use of MDI tool for assessing depression, which covers the domains of Diagnostic and Statistical Manual of Mental Disorders (DSM IVth edition)[39] as well as International Classification of Diseases (ICD-10th revision)[40] for depression diagnosis and severity. It has a satisfactory Chronbach's alpha of 0.89[41] and has been shown to fulfill Mokken's nonparametric item response theory and Rasch's one parametric model, thus making it useful for unidimensional depression severity assessment[16] with good external and clinical validity.[42] However, MDI scale has been thought of as a relatively difficult questionnaire to understand, as it has a six point Likert scale. A simpler yes/no type of Geriatric Depression Scale (GDS) has been recommended for the elderly population, but it has more number of questions than the MDI. Moreover, the GDS is considered inaccurate in the presence of cognitive decline and for extreme age groups.[43]

Although we tried to ensure the privacy of the interviewees, this was difficult in the small houses with joint families due to which the elderly participants might have guarded their opinions. Also, social desirability bias could have resulted in an underestimation of depression prevalence.

CONCLUSIONS

The prevalence of depression was high in the urban elderly population of Northern India. Depression increased with increasing age and reducing sleep time. Identification of risk factors for depression among elderly population and using those factors to identify the individuals at higher risk for depression can help the health care providers to plan for the better care of the elderly and reduce the frequency and severity of the occurrence of depression among them.

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Original Article

Prevalence and Correlates of Current Alcohol Use among Bhutanese Adults: A Nationally Representative Survey Data Analysis

Kinley Wangdi[1,2], Tshering Jamtsho[3]

ABSTRACT

Background: Alcohol-related ailments are among the 10 leading causes of morbidity and mortality in Bhutan. The objectives of this article were to determine the prevalence and explore the correlates of current alcohol use among Bhutanese adults. **Materials and Methods:** This is a retrospective study of secondary data from the National Health Survey 2012 of Bhutan. The outcome variable of interest was current alcohol use. The questionnaire was developed following the World Health Organization (WHO) STEPwise approach to Surveillance (STEPS) of noncommunicable diseases. Univariate and multivariate logistic regression was performed to identify the correlates of current alcohol use. The prevalence of current alcohol use was 30.9%. The correlates of current alcohol use were male sex [adjusted odds ratio (AOR) = 1.85; 95% confidence interval (CI) 1.47–2.36], widowhood (AOR = 2.92, 95% CI, 1.22–6.99), and chewing betel quid >20 times per week (AOR = 2.07, 95% CI, 1.08–4.03). Primary (AOR = 0.67, 95% CI, 0.50–0.91), high (AOR = 0.52, 95% CI, 0.38–0.71), and university (AOR = 0.46, 95% CI, 0.29–0.73) educated participants were less likely to be current alcohol users when compared with those who had no education. Compared with unskilled workers, services and sales workers were less likely to use alcohol regularly (AOR = 0.64, 95% CI, 0.49–0.82). Homemade alcohol *Ara* was the most common drink. **Conclusion:** The national prevalence of current alcohol use in Bhutan is higher than the national average in the WHO South-East Asia Region. Prevention should target the correlates and limit the availability of locally home-brewed *Ara*.

Key words: *Alcohol, Bhutan, correlates, modeling, National Health Survey*

INTRODUCTION

Alcohol is a psychoactive substance with dependence-producing properties. The consumption of alcohol and problems related to alcohol vary widely around the world, but the burden of alcohol-related disease and death remains significant in most countries.[1,2] Harmful use of alcohol ranks among

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the top five risk factors for disease, disability, and death throughout the world.[3] In 2012, about 3.3 million deaths were attributed to the harmful use of alcohol. This accounts for 5.9% of all deaths worldwide, which surpasses the proportion of deaths from HIV/AIDS (2.8%), violence (0.9%), or tuberculosis (1.7%).[1] Alcohol was responsible for 2.8% of all deaths from cancer, liver cirrhosis, and injury: 1.3% for women and 4.1% for men globally.[4]

Harmful use of alcohol causes direct harm to the liver. It is also an important risk factor for many chronic diseases, notably high blood pressure and other cardiovascular diseases,[5-7] poor mental health,[8,9] unsafe driving, and traffic accidents.[10-14] Around 4.9% of the world's adult population is believed to suffer from alcohol use disorder.[15] Harmful alcohol use stems from regular, heavier drinking, defined as drinking more than 40 g of pure alcohol per day for men and 20 g of pure alcohol per day for women.[16,17] In addition to the average volume of alcohol consumption, patterns of drinking – especially, irregular heavy-drinking occasions or binge drinking (defined as drinking at least 60 g of pure alcohol or five standard drinks in one sitting) – also result in harmful health impacts.[18]

The negative impact of alcohol use transcends the health burden. Alcohol imposes serious social and economic costs on individuals and society at large. The economic costs on an individual are the direct costs of alcohol consumption and healthcare costs. The second major category of social costs is indirect cost. This results, for example, from lost productivity due to absenteeism, unemployment, decreased output, reduced earning potential, and lost working years due to premature pension or death.[19,20] Third, intangible costs are the costs assigned to pain and suffering, and more generally to a diminished quality of life. Such intangible costs are borne by the drinkers as well as their families and potentially by other individuals linked to the drinker.[20]

Consumption of alcoholic beverages is a common practice among adults globally. A number of proposed factors affect the magnitude and pattern of alcohol use and predisposition to the risk of alcohol use disorders. Male sex,[21-23] young age,[21] older age,[24] no education or primary education,[22,24,25] lower socioeconomic status,[25] mental disorder,[26] medicinal benefits,[27] smoking,[28,29] betel nut chewing,[29] having a spouse who drinks alcohol,[25] manual laborer status,[26] and living in urban areas[23] have been identified in other studies as factors associated with alcohol use.

The World Health Organization (WHO) South-East Asia Region (SEAR), which comprises 25.0% of the world's population, is estimated to consume 26.4% of the worldwide unrecorded alcohol.[1] Socially and culturally, alcohol use is acceptable in Bhutan, and alcohol is often served as part of celebrations and special occasions.[30,31] Although the sale of homemade alcohol is prohibited, many homes, especially in rural areas, produce it. Common homemade alcohol varieties are spirits (Ara) and wines (Changkey, Singchang, and Bangchang). Most of the homemade beverages are made from cereals such as maize, rice, wheat, and millet. Some alcoholic products are also made from fruits. Bhutan is believed to have the highest per capita drinking prevalence among member countries of the WHO SEAR.[32] In 2015 and 2016, alcohol-related ailments were among the 10 leading causes of morbidity and mortality,[33,34] and prevalence of deaths caused by alcoholic liver disease has increased in recent years.[35] On average, the cost for medical and healthcare service for a person with alcohol dependence was estimated to be as high as USD 1,688 (Nu. 1,20,000), whereas the cost of rehabilitation for alcohol dependence was USD 675.31 (Nu. 48,000) per patient.[36] There are a total of 5,407 alcohol outlets (wholesale, retail, and functioning bars) in the country, and from those, 944 are in Thimphu, accounting for up to 17.5% of alcohol outlets in Bhutan.[37] However, there is a dearth of nationally representative prevalence studies on alcohol use and its correlates in Bhutan. The aim of this study was to explore the prevalence and correlates of current alcohol use at the national level.

MATERIALS AND METHODS

Study site

The study was undertaken in the small Himalayan Kingdom of Bhutan. Bhutan covers an area of approximately 38,394 km^2, and the population was 7,35,553 in 2017.[38] Bhutan is divided into 20 administrative districts and 205 subdistricts [Figure 1].[39] Around 62.2% (452,178) of the population live in rural areas[38] and practice subsistence farming. The altitude ranges from 75 m on the southern border with India to more than 7000 m in the Himalayas.

Data source

This study used secondary, nationally representative data from the National Health Survey (NHS) conducted nationwide in all 20 districts of Bhutan in 2012. The survey samples were estimated using the census sample frame adopted for the first Population and Housing Census of Bhutan (PHCB) in 2005. The survey sample was appropriately derived and designed to produce statistically reliable estimates of most indicators at the national and district levels, further aggregated by rural and urban categorization. The variables were all self-reported and followed the

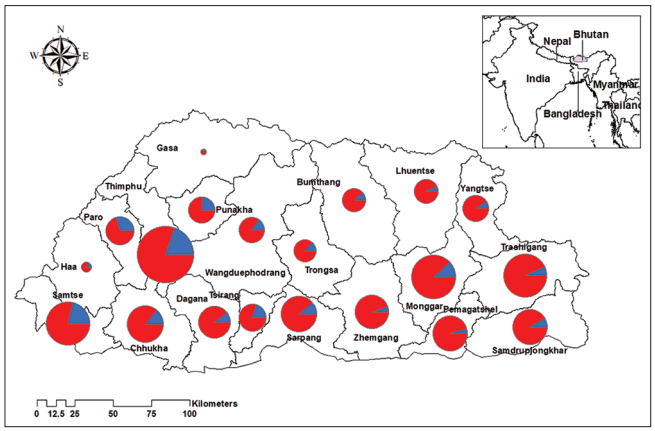

Figure 1: The proportion of current alcohol use by districts in Bhutan The size of the circles indicates the proportion of participants who used alcohol in the past 12 months. Red shows the proportion of current alcohol user and blue noncurrent alcohol user

WHO STEPwise approach to Surveillance (STEPS) of noncommunicable diseases survey guidelines. The required sample size for each dzongkhag was estimated using the sample size as follows:

$$n = \frac{z^2 p(1-p)(f)(k)}{e^2}$$

Where n is the number of households required in the sample; z is the value of the statistic in a normal distribution for a 95% confidence interval (CI; this value is 1.96, and for purposes of calculation it is rounded to 2); p is the proportion of households with access to any health facility within 1 h; e is the acceptable margin of error in estimating p, set at 0.05; f is the sample design effect, assumed to be 2.0; k is the adjustment factor for an anticipated nonresponse of 5%.

The study participants were the adult population (>18 years), and the outcome variable of interest was self-reported current alcohol use. "Current alcohol use" was defined as consumption of alcohol in the past 30 days. Independent variables were sex; age categorized as 18–24, 25–34, 35–44, 45–54, 55–64, and over 65 years; marital status; education level; occupation; urban–rural residence; ever smoked; feeling worried; and chewing betel quid.

Statistical analysis

All statistical analyses were weighted and carried out using the appended sample weights of the respective survey dataset (individual module) so as to provide nationally representative estimates. The analysis was performed using the survey (SVY) module for complex samples of the statistical package STATA version 15 (Stata Corporation; College Station, TX, USA). Bivariate and multivariate logistic regression models for correlates for alcohol use were built using backward elimination to identify significant covariates. Any variable with a P value <0.2 in the univariate analysis, along with the variable of main interest, was considered a candidate for a multivariate model. All potential dependent variables were put in the full model, and odds ratios with 95% CIs were used to demonstrate the association of each independent variable. Any variables which were of ordinal scale in nature were tested for linear trend in the final regression model. A value of $P \leq 0.05$ was considered significant.

Ethical approval

The approval by the ethics committee for this study was given by Research Ethics Board of Health (REBH), Ministry of Health Bhutan, via REBH/Approval/2018/041.

RESULTS

Sociodemographic characteristics of the study population

There were 31,066 study participants with a mean age of 39.3 ± 15.0 years and an age range of 18–75 years, and 16,731 (53.9%) of the study population were women. The majority of the study population were in the age group of 25–34 years at 8,060 (26%). Nearly half (15,666, 51%) did not have formal education, and 275 (1%) had completed a diploma or certificate level education. Two-thirds (23,420) of the participants were from rural areas. Farmers, unskilled and clerical workers, and service and sales workers made up 10,061 (66.1%) and 3,155 (20.7%) of the participants, respectively. Most of the participants were married (22,985, 74.1%). Current smokers and ever smoked made up 1,322 (4.2%) and 4,999 (16.1%) of the participants, respectively. Around 1% of the participants reported always feeling worried or lonely. More than 16,334 (52%) did not engage in exercise, and chewing of betel nut was quite common, with 1,545 (9.9%) having never chewed betel quid [Table 1].

Sociodemographic characteristics of current alcohol users

The national drinking (current alcohol user) prevalence was 30.6% (9,507). Drinking prevalence in men and women was (18.2% (12.5%, Those who had ever used alcohol and those who used alcohol in the past 12 months were 14,681 (48.0%) and 11,022 (35.5%), respectively. Among the current alcohol users, there were 5,636 (59.3%) men, 5,170 (54.5%) did not have formal education, 7,618 (80.2%) were married, 2114 (22.2%) lived in urban areas, the most common occupation group was farmers 3,573 (66.8%), 629 (6.6%) were current smokers, 2,165 (22.8%) ever smoked, 5,180 (54.5%) engaged in regular vigorous exercise, and 5,815 (71.5%) chewed up to 10 quid of betel nut per week [Table 2].

Table 1: Sociodemographic characteristics of the study population and current alcohol users

Characteristic	Total (%)	Current alcohol user (%)
Sex		
Men	14,335 (46.1)	5,636 (59.3)
Women	16,731 (53.9)	3,870 (40.7)
Age group (years)		
18-24	6,083 (19.6)	1,048 (11.0)
25-34	8,060 (26.0)	2,566 (27.0)
35-44	6,172 (19.9)	2,154 (22.7)
45-54	5,100 (16.4)	1,766 (18.6)
55-64	3,543 (11.4)	1,273 (13.4)
>65	2,106 (7.8)	698 (7.3)
Education		
No formal education	15,666 (50.6)	5,170 (54.5)
Nonformal education	2,560 (8.3)	794 (8.4)
Primary school	3,820 (12.3)	1,142 (12.0)
High school	6,260 (20.2)	1,385 (14.6)
Diploma/certificate	275 (0.9)	109 (1.2)
University	1,501 (4.8)	567 (6.0)
Monastic education	899 (2.9)	318 (3.3)
Marital status		
Single	5,223 (16.8)	1,037 (10.9)
Married	22,985 (74.1)	7,618 (80.2)
Divorced/separate	1,299 (4.2)	315 (3.3)
Widow	1,532 (4.9)	530 (5.6)
Occupation		
Clerical/farmer/unskilled	10,061 (66.1)	3,573 (66.8)
Army	540 (3.5)	218 (4.0)
Manager and professionals	1,339 (8.8)	537 (10.0)
Service and sales worker	3,155 (20.7)	959 (17.9)
Monks	134 (0.9)	64 (1.2)
Current smoker		
No	29,741 (95.8)	8,877 (93.4)
Yes	1,322 (4.2)	629 (6.6)
Ever smoker		
No	26,067 (83.9)	7,341 (77.2)
Yes	4,999 (16.1)	2,165 (22.8)
Urban		
No	23,420 (75.4)	7,392 (77.8)
Yes	7,645 (24.6)	2,114 (22.2)
Lonely		
Never	19,935 (64.2)	5,931 (62.4)
Rarely	4,039 (13.0)	1,312 (13.8)
Sometimes	6,694 (21.6)	2,136 (22.5)
Always	380 (1.2)	122 (1.3)
Worried		
Never	18,062 (58.2)	5,257 (55.3)
Rarely	4,353 (14.0)	1,443 (15.2)
Sometimes	8,312 (26.8)	2,684 (28.3)
Always	318 (1.0)	118 (1.2)
Vigorous exercise		
No	16,334 (52.6)	4,323 (45.5)
Yes	14,725 (47.4)	5,180 (54.5)
Betel chewing per week		
No quid	1,545 (9.9)	1,017 (12.5)
Up to 10 quid	11,461 (73.2)	5,815 (71.7)
11-20 quid	1,790 (11.4)	900 (11.1)
>20 quid	852 (5.4)	375 (4.6)

Thimphu district reported the highest proportion of current alcohol users, with 1,318 (13.9%), followed by Trashigang 898 (9.5%) and Mongar 880 (9.3%) [Figure 2]. There was a wide range of alcohol use with some using daily (2,598, 27.3%), while others used 1–3 days a week (1,846, 19.4%) and 1–4 days a week (2,670, 28.1%) [Figure 3a]. Most of the alcohol brewed at home (5,343, 56.0%) [Figure 3b]. The probability of alcohol use increased with age [Figure 4].

Factors associated with being a current alcohol user

In the multivariate analysis, men were nearly twice as likely to be current alcohol users than women [adjusted odds ratio (AOR) = 1.85; 95% CI, 1.41–2.29]. Widowed people were approximately three times (AOR = 2.92; 95% CI, 1.22–6.99) more likely to be current alcohol users when compared with singles. When compared with those having no education, those with primary, high, university, or nonformal education were less likely to be current alcohol users: AOR = 0.67 (95% CI, 0.50–0.91), AOR = 0.52 (95% CI, 0.38–0.71), and AOR = 0.46 (95% CI, 0.29–0.73), respectively. Service and sales workers were less likely to be current alcohol users when compared with farmers and unskilled workers, AOR = 0.64 (95% CI, 0.49–0.82). Chewing betel quid with a frequency of >20 times per week was another significant correlate of current alcohol use (AOR = 2.07, 95% CI, 1.07–3.99) [Table 3].

DISCUSSION

Using nationally representative data, this study showed that the national prevalence of current alcohol use in Bhutan is 30.6%. The correlates of current alcohol users were being men, widowed, and chewing betel quid >20 times a week. Primary, high, and university education levels were protective against alcohol use when compared with no education, as were being

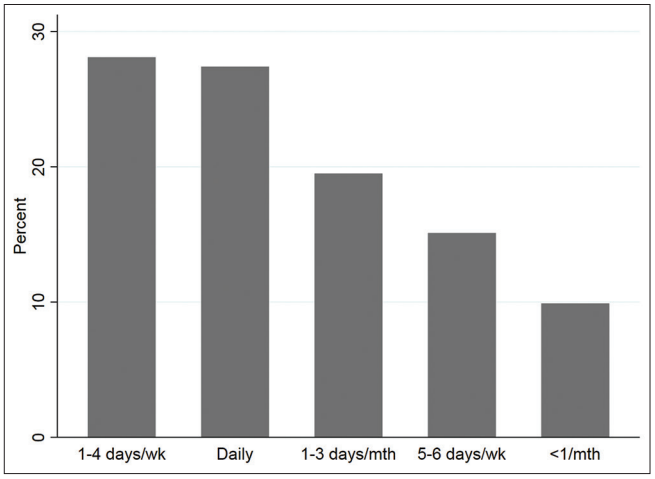

Figure 2: The frequency of alcohol use among the current alcohol user in the past 12 months. (mth: month; wk: week)

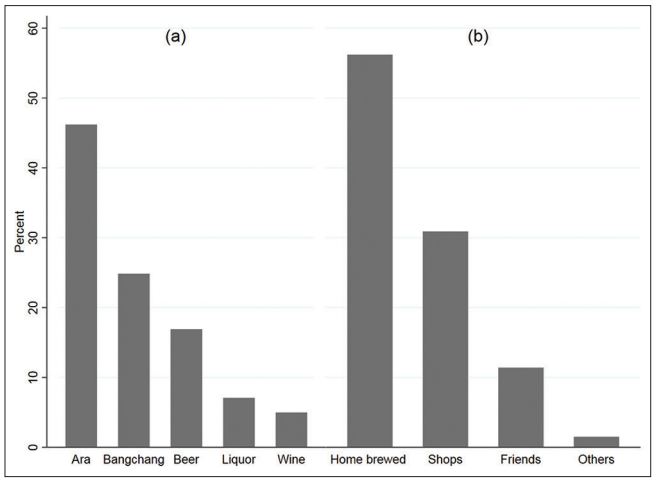

Figure 3: Different (a) types of alcohol and (b) sources of alcohol

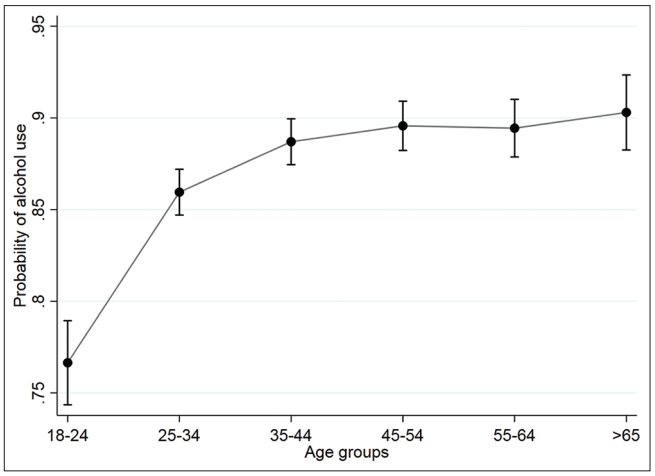

Figure 4: The probability of alcohol use by age groups

Table 2: Smoking and betel chewing among current alcohol users stratified by gender

Characteristics	Sex			
	Male (*n*, %)	Mean age (years)	Female (*n*, %)	Mean age (years)
Current smoker				
No	5,104 (90.6)	42.0	3,773 (97.5)	41.7
Yes	531.9 (9.4)	32.9	97 (2.5)	42.2
Ever smoked				
No	3,960 (70.3)	41.6	3,380 (87.4)	41.2
Yes	1,677 (29.7)	39.9	488.8 (12.6)	45.0
Betel chewing per week				
No quid	534 (15.9)	40.1	200 (8.9)	42.5
Up to 10 quid	2,253 (67.2)	39.5	1,773 (78.5)	40.4
11-20 quid	410 (12.2)	39.4	194 (8.6)	40.7
>20 quid	157 (4.7)	39.4	91 (4.0)	43.4

service or sales workers when compared with being farmers or unskilled workers. Current alcohol user was highest in Thimphu district (the capital city), followed by Tashigang and Mongar. The most common type of alcohol consumed was *Ara* brewed at home.[38]

The national prevalence of current drinkers was 30.6%, which is consistent with the published literature.[27] This prevalence is much higher than the average of 13.5% found for WHO SEAR countries in 2010.[40] Alcohol has a strong social and cultural context in Bhutan.[30,31] Alcohol is offered in Buddhist religious ritual to deities as one of the five precious elements (*duetsi*).[30] In addition, alcohol is usually served during celebrations including marriage, birthdays, and local festivals (*Tshechu*). In rural Bhutan, alcohol is served to welcome and see off guests. As a result, families have been making traditional Bhutanese liquor *Ara* from cereals and grains for many generations – and continue to do so today. This is reflected in this analysis, with more than half of the alcohol users using alcohol brewed at home and *Ara* being the most common alcoholic beverage.

Male gender was a strong correlate of current alcohol use. This finding is consistent with the published literature.[21-23,41-44] This could be due to a more tolerant attitude toward drinking by men than women in Bhutan. Other studies have identified one reason for a higher proportion of men engaging in alcohol drinking: that drinking could serve as a marker of masculinity or male camaraderie.[45-47] This may encourage male drinkers to deny or minimize problems resulting from their drinking or to regard drunken behavior as normal or permissible.

In terms of educational background, there was a strong inverse association between the education level completed and the likelihood of being a current drinker. Those who had completed higher levels of school were less likely to misuse alcohol. Education offering a protective effect has been observed in other studies.[22,24,25,48] This reflects the view that education plays an important protective role and gives a direction for designing possible intervention programs.[49]

Similarly, blue-collar occupations offered protection against alcohol use. Other studies have found that blue-collar occupation is associated with alcohol consumption[50] and that the increased risk of alcohol use with occupation is linked to job stress.[51]

Similar to another published study, chewing betel quid >20 times a week was a strong correlate of current alcohol use.[29,52] Like alcohol use, betel chewing was perceived as manly, trendy, stylish and sexually attractive.[53]

Thimphu district reported nearly 14% of all the current alcohol users in Bhutan. This can be attributed to a number of factors, including easy access to alcohol. In 2017, there were 944 alcohol outlets in Thimphu, accounting for up to 17.5% of alcohol outlets in

Table 3: Multinomial logistic regression analysis of correlates for current alcohol users

Variable	Unadjusted correlates			Adjusted correlates		
	OR	95% CI	*P*	AOR	95% CI*	*P*
Sex						
Women	Ref			Ref		
Men	1.34	1.25-1.55	<0.0001	1.86	1.47-2.36	<0.0001
Age group (years)						
18-24	Ref			Ref		
25-34	1.85	1.57-2.18	<0.0001	1.06	0.72-1.57	0.761
35-44	1.96	1.65-2.33	<0.0001	0.88	0.58-1.33	0.538
45-54	2.42	2.0-2.92	<0.0001	0.92	0.58-1.44	0.702
55-64	2.54	2.06-3.14	<0.0001	0.73	0.44-1.19	0.204
65+	2.70	2.07-3.52	<0.0001	1.05	0.49-2.24	0.904
Marital status						
Single	Ref					
Married	2.01	1.74-2.32	<0.0001	1.23	0.88-1.72	0.218
Divorce/separated	1.69	1.23-2.32	0.001	1.39	0.74-2.59	0.313
Widow	2.24	1.69-2.96	<0.0001	2.92	1.22-7.00	0.016
Education						
No education	Ref			Ref		
Primary	0.72	0.61-0.86	<0.0001	0.67	0.50-0.90	0.009
High	0.47	0.41-0.55	<0.0001	0.52	0.38-0.71	<0.0001
University or equivalent	0.35	0.29-0.43	<0.0001	0.46	0.29-0.73	0.001
Diploma/certificate	0.41	0.28-0.62	<0.0001	0.93	0.34-2.51	0.881
Monastic	1.01	0.71-1.43	0.963	1.07	0.55-2.07	0.851
NFE	0.81	0.66-1.00	0.053	0.66	0.44-1.00	0.05
Occupation						
Clerical/farmer/ unskilled	Ref			Ref		
Army	1.13	0.74-1.74	0.568	0.89	0.54-1.48	0.652
manager and professionals	0.59	0.47-0.74	<0.0001	1.09	0.72-1.65	0.676
Service and sales worker	0.54	0.45-0.64	<0.0001	0.64	0.49-0.82	<0.0001
Monks	1.69	0.67-4.31	0.27	1.00		
Urban-rural						
Rural	Ref			Ref		
Urban	0.59	0.53-0.66	<0.0001	0.98	0.76-1.25	0.842
Ever smoked						
No	Ref			Ref		
Yes	0.95	0.84-1.08	0.468	1.16	0.92-1.47	0.208
Worried						
Never	Ref			Ref		
Rarely	0.96	0.82-1.12	0.597	0.98	0.73-1.31	0.874
Sometimes	1.06	0.93-1.20	0.402	0.83	0.66-0.04	0.109
Always	1.46	0.82-2.60	0.198	3.47	0.46-26.42	0.229
Betel chewing						
No	Ref			Ref		
Up to 10 quid	0.76	0.60-0.96	0.021	0.85	0.62-1.16	0.3
11-20 quid	0.75	0.55-1.02	0.063	0.78	0.53-1.16	0.22
>20 quid	1.15	0.73-1.82	0.547	2.07	1.07-3.99	0.031

OR – Odds ratio; AOR – Adjusted odds ratio; CI – Confidence interval
*Significant

Bhutan.[37] There is a lack of a national figure on the injuries due to alcohol. However, a study from the Jigme Dorji Wangchuck National Referral Hospital emergency department had reported that 37% of all injury victims were alcohol-positive.[54] Alcoholic liver disease continues to be in the top five causes of morbidity and mortality in Bhutan.[34,35,55] This has led to significant medical and health costs in terms of care and rehabilitation for those with alcohol dependence.[36]

In recent years, there have been attempts by the government to stop the import of alcohol. However, this study suggests that the main source of alcohol was home-brewed *Ara*. This calls for a different approach to the prevention of alcohol abuse in Bhutan. In addition to price-related policies like taxation on alcohol beverages, intervention targeting reduction in production of the local alcohol *Ara* should be undertaken urgently.

The main strength of this analysis is that it is the first study in Bhutan on national alcohol prevalence and the correlates of current alcohol use. However, there are a few limitations worth mentioning. First, the cross-sectional design limits the assessment of causality and that aspect demands further longitudinal studies. Second, self-reported data are susceptible to recall and social desirability biases. Third, there was a lack of information on alcohol use disorders and alcohol-related consequences in the Bhutanese population. Finally, though the use of alcohol has been documented in adolescents, it was not included in this study.

Bhutan's national alcohol prevalence is the highest in the WHO SEAR countries, and this calls for the health policymakers to initiate national preventive strategies to reduce alcohol use. The correlates outlined in this study can be used for developing national preventive strategies. In addition, community awareness can be increased through education to reduce brewing of home-made *Ara*. This study can provide a baseline for any future studies on the prevalence of alcohol use. Furthermore, it can be used for assessing the effectiveness of any interventions directed at primary prevention by the epidemiologists and health policymakers.

CONCLUSION

The national prevalence of current alcohol use in Bhutan is higher than the national average of the countries in the WHO SEAR. Prevention should target the correlates of current alcohol use, including being men or widowed and chewing of betel quid. Strategies to reduce locally home brewed *Ara* should be prioritized.

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Conflicts of interest
There are no conflicts of interest.

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Original Article

Factors Associated with Depression among School-going Adolescent Girls in a District of Northern India: A Cross-sectional Study

Mukesh Shukla, Siraj Ahmad, Jai Vir Singh, Nirpal Kaur Shukla, Ram Shukla[1]

ABSTRACT

Context: Depression among adolescents, especially among girls, is a rising public health problem worldwide. It has been associated with a profound negative impact on their physical, social, and mental well-being. **Aim of the Study:** To ascertain the factors associated with depression among school-going adolescent girls in district Barabanki of Uttar Pradesh. **Settings and Design:** School-based cross-sectional study. **Subject and Methods:** The study was conducted among 2187 school-going adolescent girls (10–19 years) in Barabanki district from September 2016 to September 2017 using multistage sampling. Sociodemographic characteristics such as age, residence, family background, and socioeconomic status were assessed through direct interview of the adolescent girl, with its reconfirmation from school records. Eleven-item Kutcher Adolescent Depression Scale was used for assessment of depression. **Statistical Analysis Used:** Probability (P) was calculated to test for statistical significance at 5% level of statistical significance. Association between risk factors and depression was determined using bivariate analysis followed by multivariate logistic regression. **Results:** The prevalence of depression was found to be 39.7%. Multiple logistic regression revealed that depression was significantly higher among those residing in rural areas [odds ratio (OR) 3.32; $P < 0.001$], those in early and mid-adolescent age group (OR 2.51; $P < 0.001$), those studying in private schools (OR 3.22; $P < 0.001$), and those with Hindi as the medium of instruction (OR12.50; $P < 0.001$). Depression was also found to be significantly higher among those whose mothers were educated up to primary (OR 3.19; $P < 0.01$) or up to intercollege (OR 1.59; $P < 0.001$) when compared with illiterate mothers. Similarly, depression was found to be more common among those girls whose fathers were educated up to intercollege (OR 1.29; $P < 0.05$) or were graduate and above (OR 1.58; $P < 0.001$). **Conclusion:** A significant proportion of school-going adolescent girls were suffering from depression, which reflects the need for reinforcement and strengthening of school-based mental health screening programs. Parents, teachers, and community health workers should work as a team to deal with the problem in a more effective way.

Key words: *Adolescent, depression, predictors*

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INTRODUCTION

There are about 1.2 billion adolescents worldwide, with one in every five people in the world being adolescent.[1] In South-East Asia Region (SEAR) itself, there are about 350 million adolescents, comprising about 22% of the population.[2] India is the second most populous country in the world with a total population of more than 1.21 billion, with an adolescent population of approximately 243 million.[3]

The period of adolescence represents a transitional stage from childhood to adulthood and represents the critical time frame during which an individual undergoes a variety of developmental changes along with an encounter with a number of emotional and psychosocial issues. Globally, it has been reported that depressive disorders often start at an early age, with prevalence rates of mental illness among children and adolescents ranging between 1% and 51%.[4] More precisely, among adolescents between the age of 14 and 19 years, the prevalence was reported to be from 15% to 20%.[5] Depression is a global concern for children, adolescents, and adults even in developed nations.[6] Major depression was the fourth most frequent human illness in 1990 and is projected to rank second by the year 2020 in the adolescent age group.[7] In India, the combined prevalence of depression and anxiety among school-going adolescents has been reported as 57.65%, with 3% cases of extremely severe depression.[4] Depressive disorders are reported to be considerably more common in females, with a lifetime prevalence of 14.1% for females and 8.6% for males.[8,9] This has been attributed to genetics, increased prevalence of anxiety disorders in females, biological changes associated with puberty, cognitive predisposition, and sociocultural factors.[10] From health-seeking and treatment point of view, about half of depressed adolescents are left undiagnosed in primary care settings.[11]

Depression also has a deep effect on adolescents' psychosocial domain and academic performance. More often, they are more preponderate toward probability for hospitalizations, recurrent depressions, substance abuse, and antisocial behaviours, and with time, the most devastating outcome is suicide, which is the third leading cause of death among older adolescents.[12] Studying the level of depression and its association with various biosocial factors among adolescents, especially girls, will help in the development of effective preventive strategies. Based on the findings of a preliminary study done in the settings where this study was conducted,[13] this was conducted as a more extensive study to estimate the prevalence of depression among school-going adolescent girls and various sociodemographic associated with it.

SUBJECT AND METHODS

This was a cross-sectional study among school-going adolescent girls (10–19 years) studying in government, government-aided, and private schools of Barabanki district in Uttar Pradesh from September 2016 to September 2017.

Sample size

Assuming the prevalence of depression to be 18.7% based on the finding of the preliminary study,[13] an absolute precision of 2%, and design effect of 1.5, the total sample size calculated was 2187 (formula used: $n = Dz^2pq/d^2$; where n = sample size, D = design effect, z = value of standard normal deviate = 1.96 at 95% confidence interval (CI), p = prevalence of nonadherence, $q = 1 - p$, and e = absolute precision).[14]

Sampling technique

Multistage sampling technique was used. In the first stage, Barabanki district was divided into urban Barabanki and blocks of rural Barabanki. From the different blocks of rural Barabanki, two blocks were randomly selected. A detailed list of schools (both government and private) was obtained from officials of District Education Office for both urban and two randomly selected blocks of Barabanki district. In the second stage, a total of eight schools (four from an urban area and two schools each from two selected rural blocks) were selected randomly. Probability proportionate to size strategy was adopted to enrol a certain number of participants from each school. In the third stage, in each of the selected schools, a list of girl students was obtained from the principal. Then, the students were randomly selected from each class.

Data collection

A predesigned and pretested questionnaire was used for baseline data, including questions related to the number of family members and family type, the educational and occupational status of parents, enjoyment modes, and involvement in routine, including indoor and outdoor, activities. Each question was elaborated by one of the investigators, and simultaneously, the students were asked to fill in their answers in the questionnaire. The investigators included one faculty member and one postgraduate resident of the Department of Community Medicine, who together received 2 weeks training in the psychiatry department of the institution before implementation and use of Kutcher Adolescent Depression Scale (KADS) in the school settings.

Assessment of depression

Eleven-item KADS, specifically designed to diagnose and assess the severity of adolescent depression, was used. Items are scored from 0 to 3, with 0 denoting

"hardly ever" and 3 "all of the time." The scores range from 0 to 33. Higher scores indicate a greater number of depressive symptoms.[15] For the purpose of analysis, the score was dichotomized, with ≥9 being indicative of depression. Used with a cut-off score of 9, the 11-item KADS has sensitivity and specificity of 89% and 90%, respectively.[16]

Statistical analysis

Data collected were directly entered, after data cleaning and rechecking, to Epi Info software. Independent variables that were found to be statistically significant in univariate analysis were considered for logistic regression model to determine the important correlates, with depression as the dependent variable. A *P* value of ≤0.05 was considered statistically significant.

Ethical clearance

Prior permission was obtained from the District Education Officer (DEO), Barabanki, and principals of the selected schools before conducting the study, and parents were informed too through school channels. Assent was also obtained from the students after explaining to them about the objectives of the study and assuring them that their responses would be kept confidential. Permission to carry out the study was obtained from the Institutional Ethics Committee. In addition, owing to ethical responsibility, parents of those adolescents who screened positive for depression were informed with the help of school authorities and assisted for proper health seeking to a nearby health facility for further evaluation. But no data were thereafter gathered during follow-up due to feasibility and attrition issues.

RESULTS

Biosocial characteristics

Of the total 2187 school-going adolescent girls enrolled in the study, almost half (47.1%) were in the age group of 14–16 years (mid-adolescents), followed by 31% late adolescents and 21.9% early adolescents. About 45% of the girls were studying in 11th or 12th standard (class). A majority (76.2%) belonged to Hindu religion. Around 45.6% belonged to Other Backward Castes (OBC), followed by general category and Scheduled Caste/Tribes (64.9% and 65.5%, respectively). Almost two-thirds belonged to a rural background and joint family (35.9% and 18.5%, respectively). About half (52.9%) were studying in a government school, and a majority (76.0%) had Hindi as the primary medium of instruction. Almost half (51.5%) of the fathers of these girls were educated up to intercollege (12th standard), with farming/agriculture work as their main occupation. Almost half (50.4%) of the mothers were illiterate, and a majority of them were housewives (83.0%). About two-thirds (66.2%) of the girls belonged to lower socioeconomic status [Table 1].

Symptoms of depression during past 1 week

About 68.4% of the girls hardly ever reported low mood, sadness, or down feeling during the past 1 week. Around 66.9% mentioned that they hardly ever got irritable or lost temper easily or got pissed off during the past week. About 17.1% perceived that much of the time during the past 1 week, life was not very much fun and that they are not getting as much as pleasure from things as usual. About one-fifth (19.4%) felt decreased interest in hanging out with friends, lack of interest in outings, and doing school work and recreational activities much of the time. Half (50.5%) hardly ever suffered from a feeling of worthlessness or hopelessness or not being a good person during the last week. A major proportion (75.3%) hardly ever felt tired, fatigued, unmotivated, and so on during the past 1 week, and 61.8% hardly ever had any trouble to concentrate. However, 10.1% felt worried, nervous, panic, tensed, and anxious much of the time. About one-fourth (25.2%) reported physical symptoms such as headache, nausea, and restlessness much of the time over the last week. The majority (72.9%) hardly ever reported of having any thoughts/plans/actions about suicide or self-harm over the last 1 week. However, seven girls (0.3%) had the thought of suicide/self-harm almost all the time during the last 1 week [Table 2].

Factors associated with depression

The prevalence of depression was found to be 39.7%. Univariate analysis revealed that depression was significantly higher ($P < 0.05$) among girls in the early and mid-adolescent age group, those who belonged to general or OBC categories, those who reside in rural area, those who belonged to lower middle and upper socioeconomic status, those who study in private schools, and those who study in schools with Hindi as medium of instruction. Also, the higher literate status of parents (as compared to illiterate) and unemployed or in service occupational status of mother (when compared with labor/agricultural workers) were found to be associated more with chances of depression among the girls.

Multiple logistic regression revealed that depression was significantly higher among those residing in rural areas (odds ratio [OR] 3.32; 95% CI 2.60–4.25; $P < 0.001$), those in early and mid-adolescent age group (OR 2.51; 95% CI 1.85–3.33; $P < 0.001$), those studying in private schools (OR 3.22; 95% CI 2.32–4.54; $P < 0.001$), and those with Hindi as the medium of instruction (OR 12.50; 95% CI 8.33–20.0; $P < 0.001$)

Table 1: Distribution of school-going adolescent girls on the basis of background characteristics (*n*=2187)

Biosocial characteristics	Number	Percentage (%)
Age group (years)		
Early adolescents (10-13)	479	21.9
Mid-adolescents (14-16)	1030	47.1
Late adolescents (17-19)	678	31.0
Class		
6^{th}-8^{th}	657	30.0
9^{th}-10^{th}	547	25.0
11^{th}-12^{th}	983	44.9
Religion		
Hindu	1666	76.2
Non-Hindu	521	23.8
Category		
General	786	35.9
Other Backward Caste	998	45.6
Scheduled Caste/Scheduled Tribe	403	18.5
Residence		
Rural	1420	64.9
Urban	767	35.1
Type of family		
Nuclear	975	44.6
Joint	1212	65.5
Type of school		
Government	1156	52.9
Government-aided	258	11.8
Private	773	35.3
Medium of instruction		
English	524	24.0
Hindi	1663	76.0
Father education		
Illiterate	583	26.7
Up to primary	418	19.1
Up to intercollege	1126	51.5
Graduate and above	60	2.7
Mother education		
Illiterate	1103	50.4
Up to primary	472	21.6
Up to intermediate	570	26.1
Graduate and above	42	1.9
Father occupation		
Unemployed	111	5.1
Farmer/agricultural worker	1442	65.9
Service/business/professional	634	29.0
Mother occupation		
Housewife/unemployed	1815	83.0
Labor/agricultural worker	279	12.8
Service/business/professional	93	4.3
Socioeconomic status*		
Upper	29	1.3
Upper middle	48	2.2
Middle	161	7.4
Lower middle	501	22.9
Lower	1448	66.2

*Modified BG Prasad Socioeconomic scale 2017

Depression was also found to be significantly higher among school-going adolescents whose mothers were educated up to primary (OR 3.19; 95% CI 1.44–6.76; $P < 0.01$) or up to intercollege (OR 1.59; 95% CI 1.23–2.06; $P < 0.001$) when compared to illiterate mothers. Similarly, depression was found to be more among those adolescent girls whose fathers were educated up to intercollege (OR 1.29; 95% CI 1.01–1.66; $P < 0.05$) or were graduate and above (OR 1.58; 95% CI 1.17–2.12; $P < 0.001$), when compared with those whose fathers were illiterate [Table 3].

DISCUSSION

About one-third of school-going adolescent girls were having depressive symptoms. The prevalence of depression was found to be 39.7%. This is much higher compared with the findings of a preliminary study conducted in the same settings, in which the prevalence was found to be 18.7%.[13] The prevalence of depression we detected is also much higher when compared with other previous Indian studies.[17-19] However, the prevalence is quite low when compared with the findings of Jha *et al*., Nagendra *et al*., Mohanraj *et al*., and Malik *et al*., where the prevalence of depression was reported between 50% and 60% among school-going adolescents.[20-23] Also, a study conducted by Sandal *et al*. had found the combined prevalence of anxiety and depression to be about 57.65% among school-going adolescents.[4] Ganesh *et al*. had reported a much higher prevalence of 71.5%.[24] This disparity could be possibly due to the different methods used for the assessment of depression in these studies and the difference in the baseline variables of the study populations.

In this study, prevalence of depression was found to be two and a half times higher among early and mid-adolescent age group. However, it was just opposite to the findings of a preliminary study conducted in the same settings as well as other previous studies where the proportion of adolescents in older age group were having comparatively more probability of depression.[13,22,25,26] Adolescence is a transition phase from childhood to adulthood. During initial stages of adolescence, especially among females, a number of physiological developmental changes take place. This high prevalence of depression indirectly reflects toward the neurobiological vulnerability among the adolescent girls and difficulties faced by them in coping with these changes during their period of transition from childhood to adulthood.

Prevalence of depression was also found to be about three times higher among adolescents belonging to rural areas. The finding was similar to that of a previous study conducted at Chandigarh by Singh *et al*.[27] Meng *et al*. opine that adolescents from a rural background are more likely to have a poor family environment. This might

Table 2: Distribution of symptoms of depression among school-going adolescent girls during last week (*n*=2187)

Symptoms of depression over past 1 week*	Hardly ever	Much of the time	Most of the time	All the time
Low mood, sadness, feeling blah or down, depressed, just cannot be bothered	1495 (68.4)	335 (15.3)	311 (14.2)	46 (2.1)
Irritable, losing your temper easily, feeling pissed off, losing it	1464 (66.9)	368 (16.8)	295 (13.5)	60 (2.7)
Sleep difficulties - different from your usual (over the years before you got sick): trouble falling asleep, lying awake in bed	1349 (61.7)	635 (29.0)	188 (8.6)	15 (0.7)
Feeling decreased interest in hanging out with friends; being with your best friend; being with your boyfriend/girlfriend; going out of the house; doing school work or work; doing hobbies or sports or recreation	1549 (70.8)	425 (19.4)	191 (8.7)	22 (1.0)
Feelings of worthlessness, hopelessness, letting people down, not being a good person	1105 (50.5)	889 (40.6)	164 (7.5)	29 (1.3)
Feeling tired, feeling fatigued, low in energy, hard to get motivated, have to push to get things done, want to rest or lie down a lot	1647 (75.3)	389 (17.8)	142 (6.5)	9 (0.4)
Trouble concentrating, cannot keep your mind on schoolwork or work, daydreaming when you should be working, hard to focus when reading, getting "bored" with work or school	1352 (61.8)	658 (30.1)	161 (7.4)	16 (0.7)
Feeling that life is not very much fun, not feeling good when usually (before getting sick) would feel good, not getting as much pleasure from fun things as usual (before getting sick)	1601 (73.2)	373 (17.1)	187 (8.6)	26 (1.2)
Feeling worried, nervous, panicky, tense, keyed up, anxious	1581 (72.3)	221 (10.1)	324 (14.8)	61 (2.8)
Physical feelings of worry like headaches, butterflies, nausea, tingling, restlessness, diarrhea, shakes or tremors	1400 (64.0)	552 (25.2)	205 (9.4)	30 (1.4)
Thoughts, plans, or actions about suicide or self-harm	1594 (72.9)	507 (23.2)	79 (3.6)	7 (0.3)

Values in the parentheses () are row percentages. *Based on the items of Kutcher Depression Scale

Table 3: Univariate and multivariate analyses of the factors associated with depression among school-going adolescent girls

Variables	Depression			Unadjusted OR (95% CI)	Adjusted OR (95%CI)
	Absent (*n*=1317)	Present (*n*=870)	Total (*n*=2187)		
Age category (years)					
Early and mid-adolescents	883 (67.0)	626 (72.0)	1509 (69.0)	1.26 (1.04-1.52)	2.5 (1.85-3.33)###
Late adolescents	434 (33.0)	244 (28.0)	678 (31.0)	Reference	
Religion					
Non-Hindu	299 (22.7)	222 (25.5)	521 (23.8)	1.16 (0.95-1.42)	NA
Hindu	1018 (77.3)	648 (74.5)	1666 (76.2)	Reference	
Category					
General	473 (35.9)	313 (36.0)	786 (35.9)	1.32 (1.03-1.70)	1.13 (0.84-1.50)
Other Backward Class	575 (43.7)	423 (48.6)	998 (45.6)	1.47 (1.15-1.88)	1.05 (0.79-1.38)
Scheduled Caste/Scheduled Tribe	269 (20.4)	134 (15.4)	403 (18.4)	Reference	
Type of family					
Joint	710 (53.9)	502 (57.7)	1212 (55.4)	1.16 (0.84-1.35)	NA
Nuclear	607 (46.1)	368 (42.3)	975 (44.6)	Reference	
Socioeconomic class*					
Lower middle and above	377 (28.6)	362 (41.6)	739 (33.8)	1.77 (1.48-2.12)	1.12 (0.90-1.40)
Lower	940 (71.4)	508 (58.4)	1448 (66.2)	Reference	
Residence					
Rural	707 (53.7)	713 (82.0)	1420 (64.9)	3.91 (3.19-4.80)	3.32 (2.60-4.25)###
Urban	610 (46.3)	157 (18.0)	767 (35.1)	Reference	
Class					
6^{th}-8^{th}	373 (29.8)	264 (30.3)	657 (30.0)	1.29 (1.05-1.58)	5.17 (3.65-7.30)###
9^{th}-10^{th}	277 (21.0)	270 (31.0)	547 (25.0)	1.18 (1.51-2.32)	3.10 (2.31-4.17)###
11^{th}-12^{th}	647 (49.1)	336 (38.6)	983 (44.9)	Reference	
Type of school					
Private	378 (28.7)	395 (45.4)	773 (35.3)	2.06 (1.72-2.47)	3.22 (2.32-4.54)###
Government/government-aided	939 (71.3)	475 (54.6)	1414 (64.7)	Reference	
Medium of instruction					
Hindi	843 (64.0)	820 (94.2)	1663 (76.0)	9.22 (6.96-11.48)	12.5 (8.33-20.0)###
English	474 (35.9)	50 (5.7)	524 (24.0)	Reference	
Mother education					

Contd...

Table 3: Contd...

Variables	Depression			Unadjusted OR (95% CI)	Adjusted OR (95%CI)
	Absent (*n*=1317)	Present (*n*=870)	Total (*n*=2187)		
Graduate and above	13 (1.0)	29 (3.3)	42 (1.9)	3.45 (2.00-5.95)	1.06 (0.82-1.36)
Up to intercollege	309 (23.5)	261 (30.0)	570 (26.1)	1.89 (1.53-2.35)	1.59 (1.23-2.06)$^{###}$
Up to primary	271 (20.6)	201 (23.1)	472 (21.6)	1.83 (1.40-2.38)	3.19 (1.44-6.76)$^{##}$
Illiterate	724 (55.0)	379 (43.6)	1103 (50.4)	Reference	
Father education					
Graduate and above	25 (1.9)	35 (4.0)	60 (2.7)	4.26 (2.19-8.29)	1.58 (1.17-2.12)$^{###}$
Up to intercollege	637 (48.4)	489 (56.2)	1126 (51.5)	1.61 (1.31-1.76)	1.29 (1.01-1.66)$^{#}$
Up to primary	240 (18.2)	178 (20.5)	418 (19.1)	1.41 (1.13-1.76)	1.41 (0.75-2.66)
Illiterate	415 (31.5)	168 (19.3)	583 (26.7)	Reference	
Father occupation					
Unemployed	62 (4.7)	49 (5.6)	111 (5.1)	1.07 (0.71-1.62)	NA
Labor/agricultural worker	889 (67.5)	553 (63.6)	1442 (65.9)	0.85 (0.70-1.02)	NA
Service	366 (27.8)	268 (30.8)	634 (29.0)	Reference	
Mother occupation					
Unemployed/housewives	1069 (81.2)	746 (85.7)	1815 (83.0)	1.67 (1.27-2.20)	1.32 (0.96-1.80)
Service	51 (3.9)	42 (4.8)	93 (4.3)	1.97 (1.22-3.20)	1.06 (0.61-1.83)
Labor/agricultural worker	197 (15.0)	82 (9.4)	279 (12.8)	Reference	
Outdoor physical activity					
More than 3 hours a week	655 (49.7)	468 (57.3)	1123 (51.3)	1.19 (0.99-1.40)	NA
Less than 3 hours a week	662 (50.2)	402 (46.2)	1064 (48.6)	Reference	
Watching television and engagement in social media					
More than 2 hours per day	625 (47.4)	446 (51.2)	1071 (48.9)	1.16 (0.98-1.38)	NA
Less than 2 hours per day	692 (52.5)	424 (48.7)	1116 (51.0)	Reference	

Values in parentheses () are column percentages, *Modified BG Prasad Socioeconomic scale 2017, $^{###}P<0.001$, $^{##}P<0.01$, $^{#}P<0.05$. OR: Odds Ratio; CI: Confidence Interval; NA: Not Applicable

be the reason for the higher prevalence of depression among rural adolescent girls.[28]

In line with the findings reported by Shelke *et al.*,[17] in this study too, adolescents studying in lower classes (6th–10th) were found to be having more depressive symptoms. However, no such association has been observed in other previous studies.[13,17,27,29] In contradiction to that, some other previous studies had reported more depressive symptoms among students studying in higher standards and had accounted it to academic pressure.[4,30,31]

In contradiction to the findings reported by Singh *et al.*,[27] depression was found to be three times higher among adolescents studying in private schools. This might be attributed to the fact that in Indian scenario, the study culture is more competitive and hectic in private schools when compared with government ones, which thereby leads to stress among students, and on a long-term it may indirectly lead to depression.

A major finding of this study was that adolescent girls studying in Hindi medium schools were about 12 times more preponderate for depression. This finding indirectly reflects the intervening thoughts in the mindsets of these individuals studying in Hindi medium toward prospects in a future career where the English language has a major role in the upcoming competitive environment.

The results also showed that adolescents with more educated parents were at a higher risk of depression. This finding is contradictory to the results of previous studies where no such association has been observed.[13,27] The finding could be attributed to the fact that educated parents have a higher expectation from their children. Apart from that, they often try to indulge their children more toward academic activities, and often, much of their time of enjoyment/recreational activities get reduced. Second, when compared with educated parents who are often continuously involved in some jobs/outdoor activities, the illiterate parents are more available to their children to share their thoughts, feelings, and free talks, thereby reducing the risk of depression.

Almost majority of the studies in Indian and Asian setup had reported a significant association between socioeconomic status and depression.[4,13,17,29,32,33] However, no such association has been found in our study. This could be explained by the fact that although socioeconomic status has a high impending impact on cognitive and behavioral domains of adolescents, the effect of this individual-level factor could be suboptimized or nullified by other

predominant intervening factors such as parental education, occupation, and other basic background characteristics.

The study findings should be interpreted in the light of some limitations. Since the study was conducted in the schools of only one district of Uttar Pradesh and was cross-sectional in nature, the generalizability is limited and temporal associations could not be established. Apart from that, the diagnosis could not be confirmed from psychiatrists due to feasibility issues. But, besides these limitations, the study was the first of its kind in Barabanki district of Uttar Pradesh and provides a gross reflection about the mental health status of girls in adolescent age group. However, an utmost important factor, that is, the psychosocial environment of the homes, such as parental fights and beating of children by parents, was not explored due to lack of permission from a majority of the concerned school authorities.

CONCLUSION

Adolescent girls are quite preponderated toward the risk of depression. Planned interventions directly targeting the significant predictors would help deal with the problem in a more comprehensive way. Strengthening of routine school health check-ups and implementation of school-based mental health screening programs are the needs of the hour. There is also a need to make the parents understand that their role is of utmost importance from a prevention point of view. Apart from that, the school teachers, parents, and community health workers should coordinate as a team so as to identify any sort of depressive symptoms in a timely manner and seek proper health care if required.

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Conflicts of interest
There are no conflicts of interest.

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Original Article

Magnitude of Mental Morbidity and Its Correlates with Special Reference to Household Food Insecurity among Adult Slum Dwellers of Bankura, India: A Cross-Sectional Survey

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ABSTRACT

Background: Mental disorders cause considerable morbidity and disability, and there is ample evidence that mental disorders are positively associated with household food insecurity. **Methods:** A cross-sectional survey was conducted for a period of 2 months at Bakultala slum of Bankura town involving 152 people of ≥18 and ≤60 years of age selected using simple random sampling technique to estimate the prevalence of mental disorders and to find out its correlates. Information pertaining to socio-demographics and household food security (HHFS) and " potential psychiatric case" were collected through a house to house interview of the head of the household, using predesigned questionnaire, Bengali version of self-reporting questionnaire, and 6-item household food security scale (HFSS). **Results:** In total, 45% of the study participants belonged to food unsecured households. Overall, 21% of the respondents were identified as "potential psychiatric case," which was found to be associated with higher age, illiteracy, divorcee female, and people living in households without food security. **Conclusion:** Study results reflecting high prevalence (21%) of "potential psychiatric case" with various correlates such as age, sex, education, marital status, and HHFS among the slum dweller of Bankura town may be helpful in formulating policies for combating mental health morbidities.

Key words: *Adult slum population, female, food insecurity, illiteracy, mental disorder*

INTRODUCTION

Mental and behavioral disorders are important causes of morbidity in primary care settings and produce considerable disability.[1,2] The overall Disability Adjusted Life Years (DALYs) burden for neuropsychiatric disorders is projected to increase to 15% by the year 2020.[3] As per the report of the

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National mental health survey of India 2015–16, the overall current mental morbidity was found to be 10.6%.[4] India is implementing a national level program of integrating mental health with primary health care. However, psychiatric epidemiology lags behind other branches of epidemiology because of difficulties encountered in conceptualizing, diagnosing, defining a case, sampling, selecting an instrument, and lack of resources and stigma, especially in developing countries. Although mental health problems in developing countries are highly prevalent, such issues are not yet adequately addressed in these countries, where a growing number of residents live in slums. Little is known about the spectrum of mental illnesses in urban slums, and adequate research on the mental illnesses of the slum dwellers is lacking.[5]

Food insecurity is a major health problem that has devastating effects on various aspects of human life. In particular, there are compelling theoretical and empirical reasons to expect that food insecurity may be directly related to mental health morbidities and may be quantifiable in developing country settings.[6] There is evidence of an association between insecurity of income flow and common mental disorders (CMD).[7] The knowledge of the relationship that food insufficiency and mental health have, may help reduce the burden of common mental disorders, as this may be relatively amenable to intervention unlike a number of other major risk factors for mental illness. There have been studies on the association between household food security (HHFS) and various factors such as underweight children, growth faltering in children, maternal anxiety, etc.[8] However, the association between HHFS and mental morbidity of the household has not been adequately studied in our country. With this backdrop, this study was conducted to estimate the prevalence of mental morbidities among the adult population in the study area and to find out the factors associated with mental morbidity, including HHFS.

MATERIALS AND METHODS

A community-based cross-sectional survey was carried out, for a period of 2 months (from 7th August 2012 to 6th October 2012), involving permanent inhabitants of Bokultala slum of Bankura Municipality of Bankura district, West Bengal under the field practice area of Bankura Sammilani Medical College (BSMC). People aged ≥18 years and ≤60 years, without any serious illness and willing to participate in the study, were included in the study after being selected using two-stage simple random sampling technique with a sample size of 152 calculated according to a formula $n = (Z_\alpha{}^2 * p * q)/d^2$; where, $Z_\alpha = 1.96$ (two-tailed) at 95% confidence level, p (prevalence) = 0.4, q=(1 − p) = 0.6, d = allowable error = 20% of "p" assuming, and possible non-response rate of 5%.[9]

Baseline information as well as data pertaining to the mental morbidity and HHFS were collected through house-house interview using a predesigned, pretested, and semi-structured questionnaire, self-reporting questionnaire (SRQ) in Bengali version,[10] and 6-item household food security scale (HFSS) in Bengali version.[8]

The SRQ (Harding *et al*. 1980) is a standardized self-reporting questionnaire used to screen for common mental disorders and has been widely used in primary care. It indicates if the responder is a "potential psychiatric case." The SRQ was originally developed by the WHO as a screening research instrument for the detection of psychiatric morbidity across different cultures by validating, including Bengali version.[7]

To measure HHFS, 6-item HFSS was used. It was developed by the United States Department of Agriculture and has been extensively studied in the United States[11,12] as well as a few other countries[13] and found very effective in measuring food insecurity. Its validated Bengali version was used successfully in a study in Bankura.[8]

Out of the 73 slums in Bankura municipality, One slum was first selected using simple random sampling technique.[14] There were 195 households in the chosen "Bokultala slum." The list of the households, along with names of their members, was collected from family folders, and a sampling frame was made by serially arranging the population of ≥18 years and ≤60 year age group. Further, the study subjects were selected by using a computer-generated random number table till a sample size of 152 was reached. It came to a total of 58 families.

Verbal informed consent was obtained from each participant before collecting information. SRQ consisted of 24 short questions that required a "yes" or "no" response, depending on the presence or absence of symptoms. The respondent was considered to be a potential psychiatric case if the total number of "yes" answers to the first 20 questions (non-psychotic items) reached a value ≥7 (cut-off point), or if there was at least one "yes" answer to any of the four remaining "psychotic" items, or if both criteria were met.[15]

Six-item HFSS was used to assess the HHFS. Responses of "often" or "sometimes" on questions HH3 and HH4 and "yes" on AD1, AD2, and AD3 were coded as affirmative (yes). Responses of "almost every month" and "some months but not every month" on AD1a

were coded as affirmative (yes). The sum of affirmative responses to the six questions in the module was taken as the household's raw score on the scale.

Food security status was assigned as follows:
- Raw score 0–1: High or marginal food security
- Raw score 2–4: Low food security
- Raw score 5–6: Very low food security.

Further, the food security of households with raw score 0–1 was described as "food secured," and the two categories "low food security" and "very low food security" in combination was referred to as "food unsecured."

The study was initiated after obtaining clearance from the Institutional ethics committee of BSMC, Bankura on 6th August 2012. A pilot study was conducted in a similar community setting to assess the feasibility, acceptability, and reliability of the tool.

Data were described by mean, standard deviation (SD), and percentage and was displayed by tables and charts. Inferential statistical tests such as Omnibus Chi-square (χ^2) were followed by Chi-square of independence/Fisher exact test using partitioning approach to investigate further statistically significant Omnibus Chi-square test result.[16] Odds ratio (OR) with 95% confidence interval were used to analyze the different factors associated with "potential psychiatric case" along with the bearing of HHFS on it as well. A P value of <0.05 was taken as the criteria for significance.

RESULTS

Approximately, 34.9% of the study population belonged to age group 20–30 years, closely followed by 40–60 years. There was no significant difference in the male-female ratio across the age groups ($P = 0.296$) [Table 1]. The mean age of the participants was estimated to be 29 ± 4.7 years.

However, 46.1% of the study participants were daily wage earners, followed by homemakers who constituted 26.3%; 15.1% and 12.5% of the respondents were students and unemployed, respectively.

Table 1: Distribution of study population according to age and gender (*n*=152)

Age group (years)	Gender		Total No. (%)	χ^2, df*, *P*
	Male No. (%)	Female No. (%)		
Up to 20	8 (05.3)	15 (09.9)	23 (15.1)	3.69, 3, 0.296
20-30	31 (20.4)	22 (14.5)	53 (34.9)	
30-40	12 (07.9)	13 (08.6)	25 (16.4)	
≥40	26 (17.1)	25 (16.4)	51 (33.6)	
Total	77 (50.7)	75 (49.3)	152 (100)	-

*df – Degree of freedom

Moreover, 39.5% were literate, with low level (1–4 years of schooling) of formal education, and 36.8% were illiterate. Formal education for 5–0 years and >10 years was received by 19.1% and 4.6%, respectively. Overall, 63.9% were married, and 6.6% were widow/divorcee, and 45.4% belonged to food unsecured households. In total, 21.1% were "potential psychiatric cases."

Statistically significant association was found between the age of the individual and possibility of being a "potential psychiatric case" ($P = 0.001$). Those aged 40–60 years were four times more likely to develop psychiatric illness (χ^2 for linear trend 14.722, $P = 0.0001$, OR = 4.0). The Chi-square test revealed that people of 40–60 years age group are nine times more likely to psychiatric illness compared to the youngest age group, i.e., 18–20 years age group [Table 2].

Females were three times more likely to be "potential psychiatric cases." Similarly, illiterate divorcee females having lack of food security were more likely to be "potential psychiatric case" [Table 3].

Although a higher proportion of tobacco consumers were "potential psychiatric case" compared to tobacco non-users (23.9% vs. 18.5%), this difference was not statistically significant ($P = 0.413$). Similarly, alcohol consumption was found to be unrelated to the potentiality to be affected by psychiatric illness (22.2% vs. 20.8% with $P = 0.869$).

The proportion of "potential psychiatric case" was significantly higher among those with monthly family income up to INR 5,000 than those with monthly family income INR 5,001–10,000/(27.3% vs. 11.3%). The difference was statistically significant ($P = 0.019$) [Table 4].

DISCUSSION

The socio-physical environment of slums is diverse and can compromise health in a variety of ways. This study determined the prevalence of mental morbidity and analyzed the determinants of being a "potential psychiatric case" among the slum dwellers in the town of Bankura in the South-Western zone of West Bengal. It was found that mental morbidity was unequally distributed among the population. The prevalence of household food insecurity was also determined as it is of dynamic concern in urban India and was found to be one of the prime reasons for mental distress.

Table 2: Distribution of study population according to potential psychiatric case and age of the individual (*n*=152)

Age group (year)	Potential psychiatric case		Omnibus χ^2, (*P*)	χ^2, *P*	OR (95% CI)
	Yes *n* (%)	No *n* (%)			
Up to 20 (*n*=23)	1 (4.3)	22 (95.7)	16.331 (0.001)	*	1
20-30 (*n*=23)	7 (13.2)	46 (86.8)		0.422†	3.35 (0.37-76.90)
30-40 (*n*=23)	4 (16.0)	21 (84.0)		0.349†	4.19 (0.38-107.06)
≥40 (*n*=23)	20 (39.2)	31 (60.8)		9.48,0.002	14.2 (1.77-304.71)
Total (*n*=152)	32 (21.1)	120 (78.9)	-	-	-

*Reference group, †*P* value as per Fisher exact test, OR – Odds ratio, CI – Confidence interval

Table 3: Distribution of respondents according to potential psychiatric case and socio-demographics (*n*=152)

Variable	Attribute	Potential psychiatric case		χ^2, (*P*)	OR (95% CI)
		Yes *n* (%)	Not *n* (%)		
Gender	Male (*n*=77)	9 (13.2)	68 (88.3)	8.23 (0.004)	3.34 (1.33-8.57)
	Female (*n*=75)	23 (30.7)	52 (69.3)		
Education	Illiterate (*n*=56)	18 (32.1)	38 (67.9)	6.56 (0.010)	2.77 (1.17-6.65)
	Literate (*n*=96)	14 (14.6)	82 (85.4)		
Marital status	Married (*n*=97)	22 (22.7)	75 (77.3)	7.87 (0.020)	NA
	Unmarried (*n*=45)	05 (11.1)	40 (88.9)		
	Divorcee/widow (*n*=10)	05 (50.0)	05 (50.0)		
Occupation	Wage earner (*n*=70)	14 (20.0)	58 (80.0)	0.10 (0.7492)	NA
	Unemployed/homemaker (*n*=59)	18 (30.5)	41 (69.5)		
	Student (*n*=23)	02 (08.7)	21 (91.3)		
Type of Family	Nuclear (*n*=52)	06 (11.5)	46 (88.5)	4.31 (0.038)	2.69 (0.96-7.94)
	Joint (*n*=100)	26 (26.0)	74 (74.0)		
HHFS	Present (*n*=83)	11 (13.3)	72 (86.7)	5.70 (0.0170)	2.86 (1.18-7.02)
	Absent (*n*=69)	21 (30.4)	48 (69.6)		

NA – Not applicable, OR – Odds ratio, CI – Confidence interval, HHFS – House hold food security

Table 4: Distribution of participants according to their potentiality to develop into a psychiatric case and monthly family income (*n*=152)

Monthly family income (INR)	Potential psychiatric case		Omnibus χ^2, (*P*)	χ^2, (*P*)	OR (95% CI)
	Yes *n* (%)	No *n* (%)			
Up to 5000 (*n*=77)	21 (27.3)	56 (72.7)	6.086 (0.048)	5.45, (0.019)	2.95 (1.07-8.36)
5000-10,000 (*n*=62)	07 (11.3)	55 (88.7)		*	1
≥10,000 (*n*=13)	04 (30.8)	09 (69.2)		0.09†	3.49 (0.68-17.61)
Total (*n*=152)	32 (21.1)	120 (78.9)	-	-	-

*Reference group, †*P* value according to Fisher exact test, OR – Odds ratio, CI – Confidence interval

Maximum participants were aged 20–30 years, followed by 40–60 years. Majority of males were aged 20–30 years, whereas maximum females belonged to the 40–60 years group. The male-female ratio was found to be almost one, which is one of the positive aspects of this study. This might be because of the increasing consciousness regarding the saving of girl child and higher life expectancy of the females. Approximately, 46.1% of the participants were wage earners, and 26.3% were homemakers. It was because a good proportion of women were cook s and maids, engaged in wage-based work for patients admitted to the nearby BSMC and Hospital. However, 39.5% of participants reportedly had 1–4 years of schooling, and 36.8% were illiterate. Only one graduate was found in the study subjects, reflecting the typical educational status of a slum in a district town.

On assessment by the SRQ, it was found that 21.1% of the participants were "potential psychiatric cases". As per the report of the National Mental Health Survey of India 2015–16, the overall current mental morbidity was found to be 10.6%.[4] In a study conducted in Brazil on a population of 1,277 using SRQ, Lima *et al*. showed that 22.7% of people were suffering from mental morbidity, which is quite close to the value obtained here.[17] However, not many studies using the SRQ have been conducted in this part of the world. Hence, still, it might be concluded that the prevalence of "potential psychiatric case" was significantly high, and various factors might be associated with this high prevalence. Lund *et al*. observed that variables such as education, food insecurity, housing, social class, socio-economic status, and financial stress exhibit a relatively consistent and strong association with CMD.[18]

The prevalence of "potential psychiatric case" was 39.2% in 40–60 years age group and 16.0% in 30–40 years age group. This was followed by 13.2% for people aged 20–30 years. It was the least in 18–20 years age group. Statistically significant association was found between the age of the individual and likelihood of being a "potential psychiatric case."

The chance of being "potential psychiatry case" was found to be higher in females, in concurrence to the somewhat similar result found in a study on gender and mental health in Kerala.[19]

However, psychiatric disorders were more common in women aged 25–34 years than those aged 35–44 years. The increase in mental distress in the age of 40–60 years might be attributed to the fact that people of higher age group are more prone to psychological problems, especially depression; the most common geriatric psychiatric disorder might have started in the late fifties. The well-being of the elderly woman is also affected by widowhood in old age. The fact that age was related to mental well-being was also depicted in a study on mental health done in the slums of Dhaka.[20] In a study on "Stress and psychiatric disorder in urban Rawalpindi," the mean Bradford somatic inventory (BSI) scores were revealed to increase with age in both men and women.[21] This was also comparable to the observations made in a study on the prevalence of depression among pre-university college students in an urban area of South India.[22]

The prevalence of "potential psychiatric case" among illiterate was 32.1%, whereas for literate it was about 14.6% which was less than half the prevalence in illiterate. Statistically significant association was found between the educational status of the individual and likelihood of being a "potential psychiatric case" ($P = 0.010$). Thus, as one would expect, education was revealed to have a positive influence on the well-being of subjects. This fact was also supported by the study on "Gender and mental health in Kerala," which showed that the higher the level of educational attainment, the higher is the sense of well-being.[19] The fact that a sense of well-being comes with literacy was also shown in a study of depression among elderly persons in Surat.[23] Lower levels of education were associated with higher BSI in a study on stress and psychiatric disorder in urban Rawalpindi.[19] Patel *et al*. in their review, also showed an association between indicators of poverty and the risk of mental disorders, the most consistent association being with low levels of education.[24]

Unlike what was shown in the study on "Gender and mental health" in Kerala,[19] here it was the broken marriage or widowhood, instead of married or unmarried status, which seemed to have a negative impact on the sense of well-being. The prevalence of "potential psychiatric case" was 22.7% and 11.1% for married and unmarried participants, respectively, whereas in divorcee/widow it was 50.0%. There was a significant difference in prevalence between unmarried and divorcees (Fisher exact; $P = 0.011$ at df 1) and between married plus unmarried and divorcee plus widow (Fisher exact; $P = 0.035$ at df 1). This might partly be because of the stress that arises as a result of responsibilities as well as the stress of separate life. However, the higher the prevalence of "potential psychiatric case" seen in divorcee/widow group might also be linked to the increase in "potential psychiatric case" with age and small sample size in this group.

Statistically significant association was not found between the occupation of the individual and likelihood of being a "potential psychiatric case." As one would expect in connection to the occupation, unemployment among adult is associated with mental morbidity, whereas it was lower in wage earners and least in the young minds of students.

Similarly, although there was a higher proportion of "potential psychiatry cases" among those who reported tobacco-alcohol consumption, the difference was not statistically significant. It might be because of the fact that the grade of alcohol-tobacco consumption was not to the level that can induce psychiatric disorders could be considered an inducer or indicator of depression.

The prevalence of likelihood of being a "potential psychiatric case" in a joint family was greater than double the prevalence in a nuclear family ($P = 0.038$). This might be attributed to an increase in the number of family members and the presence of in-laws. There might also be the distribution of income in the joint family among a greater number of family members, leading to such results.

The likelihood of being a "potential psychiatric case" was significantly higher in individuals with monthly family income of <INR 5,000 and INR >10,000 than the group with monthly family income to the range of INR 5,000–10,000. This might be possible, as during the study it was seen that most families with family income >10,000 were joint families. An association between poverty and the risk of mental disorders was also reported by Patel *et al*. in a review.[7]

Approximately, 45.4% belonged to food secured household. According to a mid-term status report on progress of Millennium Development Goals of West Bengal, 6–11 household out of 1,000 did not have

enough food everyday during the months of July 2004 and June 2005.[24] It was found that HHFS had a positive impact on the vulnerability to be a "potential psychiatric case" ($P = 0.017$). A study in four ethnic groups in two communities of rural Tanzania also examined the association of food insecurity with mental anxiety and depression, with similar results.[6]

The study had some limitations. As it had a cross-sectional design, the assessment of seasonal variations of the impact of food insecurity could not be done. A longitudinal study would help better in this regard. The sample was taken from a single slum that might not be representative of the whole population of slums of Bankura town. The prevalence of "potential psychiatric case" was estimated using only SRQ, and no further assessment after SRQ was done to confirm caseness.

CONCLUSION

The present study reported a high prevalence (21.1%) of "potential psychiatric case" with various correlates such as age, sex, education, marital status, and HHFS among the slum dwellers of Bankura town. These results may be utilized in formulating policies for combating the forward march of mental health morbidities that are of great concern in this 21st century. Strategies should be formulated to cope up with psychiatric disorders and induce a sense of well-being among the vulnerable individuals. Grass root level workers may be deployed to increase the awareness toward the necessity of addressing household food insecurity to alleviate not only its physical consequences but also mental morbidities. However, the results of a large-scale multi-centric study would have played a better role in framing future policy as well as implementing the existing ones.

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Conflicts of interest

There are no conflicts of interest.

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Original Article

Stressful Life Events and Relapse in Bipolar Affective Disorder: A Cross-Sectional Study from a Tertiary Care Center of Southern India

Sivin P. Sam, A. Nisha, P. Joseph Varghese

ABSTRACT

Background: Bipolar affective disorder (BAD) is a severe mental illness which results in serious lifelong struggles and challenges. The full impact of stressful life events (SLEs) on the course of BAD is poorly understood. **Materials and Methods:** A cross-sectional study was conducted on 128 consecutive patients with BAD currently admitted with a relapse. Our objectives were (1) to estimate the proportion, type, and timing of preonset SLEs in relapsed BAD patients and (2) to study the association between SLEs and selected clinical variables in this group. Semi-structured proforma, Young Mania Rating Scale, Hamilton Rating Scale for Depression, Presumptive Stressful Life Events Scale, and Brief Psychiatric Rating Scale were used. Statistical analysis was done using R software for Windows. **Results:** About 69.5% (89/128) of patients reported preonset SLEs – among which 50 (56.2%) had mania and 39 (43.8%) had depression. Conflict with in-laws and financial problems were the commonly reported SLEs. The mean duration between SLEs and the relapse was 19.73 ± 4.8 days. BPRS score was significantly high in subjects with preonset SLEs ($P = 0.022$). No significant association was detected between SLEs and the type of episode during relapse ($P = 0.402$). **Conclusion:** This study emphasizes the significance of SLEs in the relapse and longitudinal course of BAD. Understanding the association of SLEs and relapse in BAD will help in predicting further relapses and developing newer pharmacological and nonpharmacological measures targeting this aspect, thereby maximizing both symptom reduction and quality of life in patients with BAD.

Key words: *Bipolar affective disorder, relapse, Southern India, stressful life events*

INTRODUCTION

Bipolar affective disorder (BAD) is a complex, severe, disabling, recurrent, and multifactorial psychiatric illness that affects approximately 1% of the world's population.[1] Contrary to the classical teaching about its episodic course, in reality, several patients with BAD do not reach full interepisodic remission and continue to have residual subsyndromal symptomatology, leading to functional impairment and impaired quality of life.[1] Convincing evidence exists for the role of genetic risk factors on the onset and course of this

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disorder. As inferred from epigenetic studies, the genetic vulnerability is potentiated by early-life events, which then act as important determinants for the first clinical manifestations of the disease.[2]

In addition to the biological factors, psychosocial factors also influence the onset, type, timing, and outcome of affective episodes.[3] The term "life events" refers to any substantial changes in personal surroundings resulting in personal and social consequences. Life events might occur unexpectedly or in an anticipated manner.[4] Stressful life events (SLEs) are described as discrete quantifiable circumstances that can have a severe negative impact.[5]

Considerable literature seems to confirm an existing link between SLEs and BAD.[6-10] SLEs are more likely experienced by patients with BAD before the episodes than by nonpsychiatric controls and SLEs appear to be more prevalent before the relapse in patients with BAD in comparison to other time periods in their life.[6,7] Among all the SLEs, the role of loss – bereavement, interpersonal separations, loss of self-esteem, and other losses – is more emphasized in relation to relapse of mood disorders.[3] Some of the proposed mechanisms for the association between SLEs and BAD include early adversity sensitization, kindling/behavioral sensitization, hypothalamo-pituitary-adrenal (HPA) axis dysfunction, neurogenic hypothesis, and social rhythm disruption.[3,4,11-14]

SLEs have played key roles in inducing relapses and recurrences in BAD by causing unhealthy affective fluctuations.[15] SLEs have been found to be associated with the initiation of manic episodes (more than depressive episodes), earlier episodes (rather than later episodes), and early onset of illness in bipolar patients.[16] In relapsed BAD patients, the SLEs preceding manic relapse were mainly related to social life (e.g., afraid of defamation, loss of social prestige) and goal attainment, whereas those preceding depressive relapses were mostly related to personal life (e.g., the death of loved one).[3,17] Expressed emotions and chronic stress were polarity-specific predictors of depressive recurrence, although episodic stress was a predictor of both manic and depressive recurrence.[9] The time-frame for SLEs' precipitating relapse of BAD has been proposed to be 4 weeks for manic and 6 months for depressive relapses. The presence of a stressor predicted a longer time to functional recovery in life domains: up to 112 days in work/school in bipolar patients.[1] There are several studies, on the contrary, which did not find any significant relationship between SLEs and bipolar disorder.[18-21] Even though positive studies outnumber negative studies, it is difficult to establish a causal link between SLEs and BAD, not only because of the large methodological variability of these studies and their results but also because the SLEs may be the consequence, rather than the cause, of the illness.[9]

The Indian population, which is currently pacing through the rapid change phase of industrialization and urbanization, is subjected to the increased psychological stress of modern life, which, in turn, might contribute to the causation of mental illnesses, including mood disorders, among the vulnerable. There are only limited studies from India regarding the role of SLEs in bipolar disorder.[3,15,22-24]

The primary objective of this research is to estimate the proportion, type, and timing of preonset SLEs in relation to relapse in BAD. We also planned to study the association between SLEs and selected clinical variables among relapsed patients with BAD, which was kept as our secondary objective.

This study emphasizes the need for exploring the SLEs in relapsed BAD patients. Understanding the association of SLEs with relapse in BAD will help in predicting further such relapses and developing newer pharmacological and nonpharmacological measures targeting this aspect, thereby maximizing both symptom reduction and quality of life in patients with BAD.

MATERIALS AND METHODS

This was a cross-sectional study in which 128 consecutive patients admitted in psychiatry ward of MOSC Medical College, Kolenchery, Kerala, India, between March 2016 and September 2017, with relapse of BAD, who met the inclusion criteria, constituted the study sample. The sample size calculated based on estimate of proportion with $\alpha = 5\%$, $p = 33\%$,[25] and $d = 10\%$ using the given formula was 85:

$$n = \frac{z_{1-\alpha/2}^{2} p(1-p)}{d^2}$$

As the total number of consecutive patients who met the inclusion criteria during the stipulated study period was 128, we preferred the higher among the two sample sizes.

Operational definitions

These definitions were operationalized for this study by the authors, after reviewing certain previous studies.[26-29]

Relapse

Worsening or reoccurrence of manic, depressive, or mixed affective signs and symptoms after a period of eight weeks of a premorbid level of functioning.

Preonset period

One month period back from the day of onset of symptoms, that is, the day on which the informant started recognizing that the patient is obviously abnormal and needs intervention.

Inclusion criteria

All patients in the age group of 18–60 years belonging to either sex, who got admitted to the psychiatry ward with a relapse, and having a diagnosis of BAD – current episode manic/depressive/mixed (F31.1, F31.2, F31.3, F31.4, F31.5, F31.6) based on International Classification of Diseases – 10th Edition Diagnostic Criteria for Research (ICD-10 DCR) classification of Mental and Behavioral disorders, were recruited. Written informed consent was obtained from the patient and/or relative if the patient lacked the capacity to give valid consent. For such patients, when they regained that capacity, the consent was taken from them in addition to their relatives.

Exclusion criteria

Clinically diagnosed cases of delirium, organic mood (affective) disorder, mental retardation, end-stage medical illnesses (chronic kidney disease, chronic liver disease, congestive heart failure), and newly diagnosed cases of BAD were excluded. The newly diagnosed cases of BAD were excluded to retain the uniformity of the study group – which should contain definite BAD cases who were on standard regime for BAD as per the institution protocol when they relapsed, and the hospital records were cross-checked to determine whether the relapse met the operational criteria as per this study.

Assessment

The ICD-10 DCR was used to diagnose BAD in the subjects.[30] The following tools were used for assessment:

1. Presumptive Stressful Life Events Scale (PSLES)[31]
2. Hamilton Rating Scale for Depression (HAM-D)[32]
3. Young Mania Rating Scale (YMRS)[33]
4. Brief Psychiatric Rating Scale (BPRS).[34]

A semi-structured proforma was used to collect data regarding sociodemographic and clinical variables such as details of the current episode, the timing of SLEs, substance use, family history, medical comorbidities, PSLES, BPRS, HAM-D, and YMRS scores at intake and follow-up.

Procedure

The study protocol got approval from the Institutional Ethics Committee. The sociodemographic and clinical details were recorded using the semi-structured proforma. YMRS or HAM-D (depending on the polarity of the affective episode during relapse) and BPRS were administered at intake to assess the severity of relapse. These scales were reapplied at the time of clinical remission (i.e., when the patients ceased to exhibit any mood symptoms), either at the time of discharge or during subsequent out-patient department follow-ups, to check whether YMRS became <12 or HAM-D <7, to confirm the remission. PSLES was administered to quantify the preonset SLEs when the patients reached remission – both clinically and when YMRS became <12 or HAM-D <7. The proportion, type, and timing of the preonset SLEs were estimated. The relationship between preonset SLEs and variables such as the type of affective episode in relapse, the severity of current episode (YMRS, HAM-D, BPRS scores), and duration of inpatient stay during the relapse were analyzed.

Statistical analysis

Chi-square test was done to study the association between SLEs and selected categorical variables. We compared the duration of inpatient stay and YMRS, HAM-D, and BPRS scores in the two groups – the groups with and without preonset SLEs – using Mann–Whitney *U* test, as the data violated normality assumption. $P < 0.05$ was considered statistically significant. Statistical analyses were performed using R software for Windows.

RESULTS

Sociodemographic and clinical characteristics of the study group are recorded in Table 1. About 69.5% (89/128) of the relapsed BAD patients had SLEs in the preonset period. About 72.6% (53/73) of the relapsed males reported preonset SLEs versus 65.5% (36/55) of the relapsed females – the difference was, however, not statistically significant ($\chi^2 = 0.46$, $P = 0.49$).

The most frequent SLEs reported were a conflict with in- laws (16%) and financial loss or problems (15%) [Table 2]. When males and females were considered separately, financial loss or problems, conflicts with in-laws (other than dowry), unemployment of self or a family member, and marriage of daughter or dependent sister were the most frequent SLEs among males, whereas females reported conflicts with in-laws (other than dowry), family conflict, and illness of family member as the commonly occurring SLEs. The mean duration between the SLEs and relapse was 19.73 ± 4.9 days.

Among those with preonset SLEs, 56.2% (50/89) had mania and 43.8% (39/89) had depression. Of all the BAD relapses, 66.7% (50/75) of the manic episodes had preonset SLEs when compared with 73.6% (39/53)

Table 1: Sociodemographic and clinical characteristics of the study group

Variables	Mean (SD)	*n* (%)
Age (years)	40.19 (8.7)	
Gender		
Males		73 (57.0)
Females		55 (43.0)
Education		
Primary		70 (54.7)
Secondary/higher secondary		45 (35.2)
Postgraduation, professional, or above		13 (10.1)
Residence		
Rural		113 (88.3)
Semi-urban		15 (11.7)
Marital status		
Married		83 (64.9)
Unmarried		31 (24.2)
Separated/divorced		14 (10.9)
Religion		
Christian		68 (53.1)
Hindu		40 (31.3)
Muslim		20 (15.6)
Alcohol use		
Present		51 (39.8)
Tobacco use		
Present		41 (32.0)
Diabetes mellitus		
Present		25 (19.5)
Hypertension		
Present		17 (13.3)
Family history of BAD		
Present		9 (7.0)
Family history of schizophrenia		
Present		2 (1.6)
Duration of IP stay (days)	9.09 (2.7)	

n - Frequency; SD - Standard deviation; IP - Inpatient; BAD - Bipolar affective disorder

of the depressive episodes. The association between SLEs and the type of affective episode during relapse was not statistically significant ($\chi^2 = 0.413$, $P = 0.52$). About 34.8% (31/89) of the relapsed patients with preonset SLEs had psychotic symptoms on mental status examination, whereas only 20.5% (8/39) of those without preonset SLEs had psychotic symptoms. However, the association was not statistically significant ($\chi^2 = 1.99$, $P = 0.158$).

BPRS score was found to be significantly higher in bipolar patients with preonset SLEs ($P = 0.022$) [Table 3].

DISCUSSION

The study group consisted of middle-aged patients, with a mean age of 40.19 ± 8.7 years, comparable to similar previous studies.[15,35,36] Nearly 70% (89 of 128) of the patients experienced SLEs within 1 month prior to the relapse. This suggests a rather stable and high prevalence of SLEs during the preonset period of relapse, which was also reported in other studies.[10,23]

Among the 128 consecutive patients, 75 (58.6%) had mania, whereas 53 (41.4%) had depression. The proportion of relapsed subjects with preonset SLEs in our study was greater for patients with mania (56.2%) than depression (43.8%). Among the total sample of relapsed patients and those with relapse who had preonset SLEs, mania seemed to outnumber depression in contrast to the depression-predominant course patterns of BAD witnessed in Western literature.[25,37] The overrepresentation of mania in relapsed bipolar patients is replicated in similar reports, mostly from tropical regions, like India, Nigeria, and Hong Kong, which is hypothesized to be due to the effects of bright sunlight and a less variable day–night cycle on the zeitgeber.[24] We took remitted patients for analyzing SLEs as studies pointed out that the affective symptoms present during the relapse can influence and color the reporting of SLEs.[15]

In this study, conflict with in-laws (other than dowry), financial loss or problems, illness of family member, marriage of daughter or dependent sister, unemployment in self or family member, and family conflicts were the most frequently reported SLEs implicated in the relapse of BAD. This finding is concurrent with the existing global literature.[15,23,38,39] In a comparative study of family interactions of patients with schizophrenia or BAD, Miklowitz *et al*. reported that patients with BAD, especially those with relatives having high verbal interactional behaviors, often took a predominantly externalizing, refusing attitude in interactions and frequently opposed the opinions, criticisms, or suggestions expressed by relatives, often resulting in a conflictual interaction rather than domestic violence which occurs during manic episodes.[40] In addition, the emotional dynamics within the family and negative expressed emotions also contribute to family conflicts.[40] The differences in the kinds of SLEs leading to the relapse in BAD could be due to different methodology, region, season, cultural factors, or the use of different rating scales for quantifying SLEs and the different preonset time periods considered in various studies.

The mean time period between pre-onset SLEs and relapse was 19.73 ± 4.9 days in our study. The effect of those SLEs which occurred shortly before relapse indicates that such life events have an acute, rather than a delayed effect on the risk of relapse and/or that SLEs *per se* and not other etiological factors (e.g., comorbid personality disorder, substance use) can act as triggers for more affective relapses.[10]

Table 2: Type and distribution of preonset stressful life events

Type of preonset SLEs	*n* (%)
Conflict with in-laws (other than dowry)	14 (15.7)
Financial loss or problems	13 (14.6)
Marriage of daughter or dependent sister	8 (9.0)
Illness of a family member	8 (9.0)
Family conflict	6 (6.7)
Self or family member unemployed	6 (6.7)
Change in residence	4 (4.5)
Major personal illness or injury	3 (3.4)
Death of friend	3 (3.4)
Marital conflict	3 (3.4)
Death of close family member	3 (3.4)
Death of spouse	3 (3.4)
Trouble with neighbour	2 (2.3)
Son or daughter leaving home	2 (2.3)
Lack of child	2 (2.3)
Going on a pleasure trip or pilgrimage	1 (1.1)
Change in sleeping habits	1 (1.1)
Change or expansion of business	1 (1.1)
Major purchase or construction of a house	1 (1.1)
Excessive alcohol or drug use by a family member	1 (1.1)
Property or crops damaged	1 (1.1)
Suspension or dismissal	1 (1.1)
Marital separation/divorce	1 (1.1)
Extramarital relation of the spouse	1 (1.1)
Total	89 (100)

n - Frequency; SLEs - Stressful life events

Table 3: Comparison of clinical variables among relapsed bipolar affective disorder patients with and without preonset stressful life events

Variables	Median (Q_1, Q_3)		*P*
	SLEs+	SLEs−	
YMRS	22 (19.5, 28.5)	20 (18, 24)	0.07
HAM-D	23 (18, 31)	24 (21.5, 26.5)	0.86
BPRS	19 (14.5, 21)	16 (14, 19)	0.02*
IP stay (days)	9 (7, 11)	9 (7, 11)	0.91

SLEs - Stressful life events; YMRS - Young Mania Rating Scale; HAM-D - Hamilton Rating Scale for Depression; BPRS - Brief Psychiatric Rating Scale; IP - Inpatient *$P<0.05$

Although we did not find any significant association between SLEs and the type of affective episode during relapse as well as the intensity of manic or depressive symptoms during relapse, psychotic symptoms were more commonly, but not significantly, present in the relapsed affective episodes of those who reportedly had preonset SLEs. This could be interpreted as one of the impacts of SLEs on the clinical course of BAD, as psychotic features indicate a more severe course of illness.[4] BPRS scores were found to be significantly higher in the group with preonset SLEs, but further interpretations are limited as we did not perform an item-wise comparison of BPRS scores in the two groups.

A few researchers have proposed moderators of life stress in BAD. Certain factors such as interpersonal dependency, introversion, and obsessionality have been found to increase the risk for relapse after a negative SLE, whereas interpersonal events, interpersonal dependency, and the interaction of these two factors have been found to predict higher symptom severity scores and faster relapse in BAD. In addition, female gender and cognitive vulnerability can predict depressive symptoms after negative SLEs, whereas cognitive vulnerability and pre-event hypomanic symptoms can act as predictors for manic symptoms after life events.[41]

Including clinically as well as rating scale score-wise remitted patients for analyzing SLEs, without allowing the affective or psychotic symptoms to influence the reporting of SLEs, is one of the strengths of our study. Our study had several limitations also. The sample constituted by inpatients from a tertiary care teaching hospital would not represent patients with BAD in the general population. The causality of the particular SLEs leading on to the current relapse could not be established because of the cross-sectional study design. Life events can very well be associated with either the causation of or a consequence of mood episodes, which will be difficult to distinguish. Treatment adequacy and adherence could be independent predictors of relapse in BAD, which were not quantified in our study. We studied only a limited number of variables associated with SLEs and relapse in BAD. We had restricted the SLEs to those included in PSLES strictly; hence, the effects of more remote stressful events, such as childhood trauma, which may affect an individual's sensitivity to stressors in adult life,[22] were not examined. Some of the data were gathered retrospectively and may, thus, be distorted by recall.

Of recent, there is a growing interest in defining and exploring the factors leading to relapse in BAD and in discovering newer interventions based on these parameters. Several important avenues for future research need to be mentioned, such as exploration of the influence of personality profile and cognitive factors[3] of the patients (e.g., attribution styles, perfectionism, problem-solving skill deficits, maladaptive schemata and coping styles), subtype of BAD, social support, subjective experience of SLEs, severity and critical timing of SLEs, and building consensus on the most reliable as well as valid phenotyping and assessment tools, to design more and more prospective community-based research plans with truly large sample sizes – all of which will ultimately result in reduction in the chances of relapse and recurrences, thereby enhancing the functional recovery and quality of life in patients with BAD.[4]

CONCLUSION

SLEs, predominantly family conflicts and finance-related problems, were present in a significant proportion of relapsed BAD patients.

Assessing life events can be of great help in future to plan strategic interventions to combine pharmacotherapy with psychotherapies based on psychoeducation and interpersonal, family, and cognitive–behavioral interventions which focus on addressing the SLEs, coping with them effectively, alleviating their negative impact in terms of symptom reduction, delay of recurrence, as well as modifying interpersonal functioning and even preventing negative life events by anticipating and mitigating the ways in which individuals' symptoms, characteristics, and circumstances may contribute to the occurrence of acute events.[1] BAD is a major health concern, both for the individual and for the society, and more information is still needed about the factors leading on to its relapses.

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Conflicts of interest

There are no conflicts of interest.

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Original Article

Pathways to Care for Patients with Bipolar-I Disorder: An Exploratory Study from a Tertiary Care Centre of North India

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ABSTRACT

Introduction: Understanding the pathways to psychiatric care is important from a public health perspective. Only a few Indian studies have focused on this, particularly for severe mental disorders. The present study was planned to assess it in patients with Bipolar-I disorder (BD-I). **Materials and Methods:** Sixty-four patients with DSM 5 diagnosis of BD-I and their caregivers were included. A semi-structured interview proforma was used to gather information. **Results:** Psychiatrists were the first care provider in 43.8% of the cases, followed by traditional faith healers (32.8%) and general physician/neurologists (17.2%). The median duration of untreated bipolar disorder (DUB) was 21 days (1 day to 152 months). Relatively long DUB (3.5 ± 3.5 years) was found for 17.2% of the sample. The median duration of the first contact with a psychiatrist was 45 days and the interval between the contact with the first care provider and a psychiatrist was 90 days (1 day to 151 months). At the time of first treatment seeking, 64% of patients and caregivers had poor awareness regarding psychiatric treatment. **Conclusions:** Patients with BD-I seek help from psychiatrists, faith healers or other medical practitioners for multiple reasons. There is a need to sensitise the community and various service providers about early identification and optimum management of BD-I.

Key words: *Bipolar-I disorder, pathways to care, India*

INTRODUCTION

Bipolar I Disorder (BD-I) is an episodic, recurrent and often disabling illness[1] that negatively influences various spheres of patients' lives. World mental health survey revealed an aggregate prevalence of BD-I to be 0.6% across 11 countries in America, Europe and Asia.[2] There is an acute shortage of mental health resources to deal with the burden of this illness in developing countries like India.[3] A large number of people suffering from psychiatric illness do not seek treatment directly from mental health professionals. Patients and families often approach alternative service providers, including physicians, general practitioners, lay counsellors, local religious leaders, or traditional

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faith healers.[4] In the developed countries as well, a substantial number of patients with mental illness may consult the general medical sector, comprising general physicians or general practitioners, who in turn refer the patients to psychiatrists.[5,6]

Mental health specialists are not always the initial source of care for BD-I rather, a combination of healthcare practitioners are approached for treatment.[7,8] According to a study, BD-I patients mostly sought help from spiritual leaders, general practitioners, psychologists, psychiatrists and traditional healers.[9] In the USA and Canada, 26% and 62% of these patients respectively do not seek specialized care for their illness[10-12] while in Mexico, they seek care from general medical services (9.6%), mental health services other than a psychiatrist (12.9%) and psychiatric services (3.6%).[13] Thus, duration of untreated bipolar disorder (DUB), the interval between the onset of the first mood episode and first treatment with a mood stabiliser, was found to be 3.2-20 years.[14-18] A longer DUB has been found to have a significant association with relatively poorer clinical outcomes, such as elevated rates of rapid cycling and anxiety disorders, lower levels of current full remission, increased rates of suicidal behaviour, a higher number of mood episodes, increased social difficulties, more employment problems, and higher social costs.[14-17] Many times, barriers to patients in gaining access to appropriate care would be poor awareness, social stigma, the absence of easily accessible treatment facilities, financial, legal/governmental issues, and cultural construct and beliefs.[4,7] Therefore, many patients come for treatment later in the course of their illness.

Relatively few studies have been carried out on the help-seeking behaviour of the Indian patients with mental illnesses.[3,19,20] Those studies have found that a psychiatrist, a general physician or a faith healer are the first ports of call for help.[3,4,20] Some studies attempted to focus on only a specified group of patients like dhat syndrome,[21] medically unexplained symptoms,[22] and alcohol-dependent patients.[23] However, no prior Indian study primarily focused on BD-I patients.

Thus, understanding the pathways to care for BD-I is warranted in order to gain insight into health-related beliefs and help-seeking patterns in a given cultural context and duration of untreated illness. Additionally, it will help to plan mental health services and policy, to organise training, to promote referrals to psychiatrists from other sources of health and social care, and to increase awareness by identifying the illness.[24,25] Therefore, this study was formulated to bridge the gap in existing research on pathways of care for the particular diagnosis of BD-I in the Indian context.

MATERIALS AND METHODS

Ethical consideration

Ethical approval was received from the Institutional Ethics Committee. Written informed consent was taken from all subjects prior to participation.

Participants

It was a cross-sectional study. Sixty-four patients fulfilling DSM-5 criteria for BD-I and their caregivers were recruited consecutively from the outpatient psychiatric department of a tertiary care hospital between July and October 2017. Patients were in the age range of 18-60 years, seeking treatment at the centre, of either gender, and willing to provide a written informed consent. Patients with Bipolar II Disorder (BD-II) and Bipolar III Disorder (BD-III), or having a comorbid psychiatric illness (as per DSM-5 criteria) or neurological disorder and those who refused to provide informed consent were excluded. Due to the abrupt, dramatic onset and unmanageability of manic episodes in BD-I, the routes adopted by BD-I patients and their caregivers and duration of untreated illness (DUI) of these patients are different from patients of BD-II, BD-III and those with other comorbidities. A previous study also highlighted that patients with BD-II had the longest DUI (97.2 months) in comparison with the other groups, including major depressive disorder, BD-I, generalised anxiety disorder, panic disorder and obsessive compulsive disorder.[14] Thus, the index study recruited only BD-I population for homogeneity and excluded BD-II, BD-III and those with comorbidities.

Assessments

Socio-demographic and clinical data sheet: This data sheet was developed for the present study by the authors to obtain socio-demographic (age, gender, education level, marital status, locality, family type and economic status) and clinical details (age of onset, total duration of illness, family history, untreated duration, episode at presentation, duration of current episode, etc.) of the participants.

Pathways interview proforma: A semi-structured interview proforma was designed specifically for the current study to obtain information about variables related to pathways of care of patients with BD-I and their caregivers (including first care provider, reasons for choosing a specific service, delays on the pathways to psychiatric care, etc.). This proforma was developed after a thorough review of the literature and tools like WHO Pathways Encounter Form. After the development, the proforma was examined for content validity by four subject experts prior to its administration.

Procedure

After informed consent had been obtained, socio-demographic information and clinical details were collected as per the socio-demographic and clinical data sheet. Furthermore, the subjects were examined for their help-seeking pattern from psychiatrist using the specially designed semi-structured proforma. Interviews were conducted by mental health professionals. The duration of the interview session was 30-45 minutes.

Analysis

The data was analysed using Statistical Package for Social Sciences (SPSS), version 21.0 (SPSS, Chicago, IL, USA). Descriptive statistics were applied to examine demographic, clinical and academic variables. These included frequency, percentage, means, standard deviations, median and range. Further, demographic and clinical variables were compared among groups using either one-way analyses of variance (ANOVAs-continuous variables) or Chi-square test with Fisher's exact test (categorical variables). Kruskal-Wallis non-parametric test was used to compare the median values among the groups in the case of a non-normal distribution.

RESULTS

The sample consisted of 64 patients: 46 males and 18 females. The mean (SD) age of the sample was 39.27 (±13.37) years. Majority of the participants were educated up to graduation or above (n = 23), married (n = 43), belonged to the Hindu religion (n = 59), and had a nuclear family (n = 36). Only 12 patients were from lower socio-economic status, and eight were from the rural area, rest of participants were coming from upper or middle socio-economic status (n = 52) and urban or suburban locality (n = 56). During the time of assessment, participants were either euthymic (65.6) or in the state of depression (15.6%), mania (12.5%), or hypomania (6.5%). The mean age of onset was 24.67 (SD = 8.6) years, and the median duration of illness was 11 years (range: 2-40 years). Majority of the patients had ≤10 years of total duration of illness (n = 30), while 22 patients had a total duration of illness between 11 to 20 years, and only 12 patients had more than 20 years total duration of illness. Sixteen patients had a positive family history of psychiatric illness. Currently, all patients were either on mood stabilisers or antipsychotics or a combination of both.

Psychiatrists were the most common care providers chosen as the first contact, which included psychiatrist outside the index institute or direct visit to index institute outpatient service. Approximately 33% of patients had consulted a traditional faith healer in the first instance, whereas 17% went to a general physician or neurologists and 4.7% consulted an alternative medicine practitioner [Table 1]. Consultation with a psychologist was the first choice of one patient (1.6%). Fifty percent of the patients visited a traditional faith healer at any point of time during the course of their illness, whereas 11% consulted a general physician or neurologist at some time and 11.7% had been to an alternative medicine practitioner. Seventy per cent had sought help from a psychiatrist outside the index institute before coming to our setting.

Belief about illness as caused by supernatural power, a 'mind illness' or behavioural symptoms, and recommendation from family/friend/routine care provider were the common reasons for choosing a service [Table 2]. Majority of the patients sought help from our centre on the advice of relatives (34.4%), family members (12.5%), or friends (6.3%) or came on their own (15.6%). Twenty patients were referred by general practitioners/specialists (31.3%).

A systematic breakdown of the delays in care is presented in Table 3. The median DUB was 60 days (range: 1 day-152 months) while patients with long DUB in years accounted for 17.2% of the sample (mean ± SD = 3.5 ± 3.5; median = 2.5 years). Time to seek help for treatment from the first care provider, time of seeking care from a psychiatrist for the first time, and time for seeking psychiatry care after visiting first care provider varied from 1 day to 152 months. Forty-two families reported that they did not have awareness about psychiatric treatment at the time of the first contact. Furthermore, 11 families expressed intention to continue the faith-healing or traditional healing procedure.

Patients were divided to three groups based on their first contact with care provider, i.e., first contact to psychiatrists/psychologists (Group 1), first contact to non-medical care provider including traditional faith healer (Group 2), and first contact to other medical care provider including general physician, neurologist, and alternative medicine practitioner (Group 3). Groups were compared on demographic and clinical profiles [Table 4]. All three groups were similar on most of the demographic and clinical variables, but differed on

Table 1: Pathways to care (n=64)

Variables	1st contact	2nd contact	3rd contact	4th contact
Traditional faith healer	21 (32.8)	10 (15.6)	7 (10.9)	-
General physician/neurologists	11 (17.2)	6 (9.4)	1 (1.6)	-
Alternative medicine practitioner	3 (4.7)	4 (6.3)	-	-
Psychiatrist	28 (43.8)	35 (54.7)	23 (35.9)	31 (48.4)
Psychologist	1 (1.6)	-	-	-

Values expressed as n (%)

Table 2: Reasons for visiting various treatment facilities at first contact (*n*=64)

Stated reasons for help seeking	Traditional faith healer (21)	General physician/neurologists (11)	Alternative medicine practitioner (3)	Psychiatrist (28)	Psychologist (1)
Easily accessible	-	-	1 (1.6)	1 (1.6)	-
Family doctor/routine care provider	-	1 (1.6)	-	9 (14.1)	-
Considered a supernatural power	17 (26.6)	-	-	-	-
Considered a physical illness	1 (1.6)	5 (7.8)	1 (1.6)	-	-
A "mind illness"/behavioural symptoms	-	4 (6.3)	-	10 (15.7)	-
Advice of relatives/friends/ neighbour/self	3 (4.7)	1 (1.6)	1 (1.6)	8 (12.5)	1 (1.6)

Values expressed as *n* (%)

Table 3: Delays in the pathways to psychiatric care median (range)

Delay in treatment	Value
Duration of untreated bipolar disorder-DUB (days)	60 (1 day-152 months)
Time to seek initial help from any source (days)	21 (1 day-52 months)
Time to seek help from a psychiatrist (days)	45 (1 day-152months)
Time to seek help from the first care provider to a psychiatrist (days)	90 (7 days-151 months)
Awareness of psychiatric treatment at the time of the first contact	
Yes	22 (34.4)
No	42 (65.6)
Money spent on faith-healing till date (INR)	4000 (100-5,00,000)
Intention to continue the faith-healing simultaneously	
Yes	11 (17.2)
No	53 (82.8)

DUB – Duration of untreated bipolar disorder; INR – Indian Rupees

education level ($P = 0.005$), locality ($P = 0.001$) and awareness of psychiatric treatment at the time of first contact ($P = <0.001$).

DISCUSSION

To the best of our knowledge, this is the first study to specifically assess the pathways to care for a homogeneous sample of Indian patients with BD-I. Such information on routes adopted by patients with BD-I and their caregivers is lacking in the Indian and global context. Here, we present the pathways to care in a sample of patients with BD-I.

The study findings reflect that psychiatrists were the first contact care provider, followed by traditional faith healers and general physician/neurologist. Initially, more than a half of BD-I patients initiated care either with traditional faith healer or general practitioner or alternative medicine practitioners and subsequently consulted psychiatrists. This finding of the psychiatrist as the first contact in a relatively large proportion could also be due to the catchment area of the index institute comprising people mainly from urban areas of states like Delhi, Haryana, Uttar Pradesh, Rajasthan, Madhya Pradesh and Bihar. These were more educated and aware of psychiatric treatment at the time of the first contact. Secondly, it could be due to the presence of a family history of psychiatric illness in more than one-fourth of patients. Presence of family member or close relatives with known mental illness may lead to sensitisation and early psychiatric consultation and treatment for patients' illness. Alternately, it could also be due to the abrupt, dramatic onset coupled with unmanageability associated with manic episodes, which may facilitate an early medical/psychiatric contact.

The findings from present study corroborate to some extent with previous studies, showing that the pathways to care in BD-I are composed of a combination of healthcare practices and is through a referral from primary care, mostly allopathic practitioners.[7,8] They approach spiritual leaders, general practitioners, psychologists, psychiatrists and traditional healers for treatment of their illness.[9,13] A study had estimated the 12-month prevalence of conventional (i.e., psychiatrists, psychologists, other MDs, nurses, and social workers) and unconventional mental health service (religious advisors and complementary and alternative medicine practitioners) use in major depressive disorder (MDD) or mania. The authors found that majority of the patients with MDD (52.9%) and manic episodes (49.0%) used conventional mental health services, while approximately 21% of patients with MDD or manic episodes used natural health products (e.g., herbs, minerals or homoeopathic products).[26] Similar to this, an Indian study found faith healers as the first port of contact in more than half of the total psychiatric patients that included a majority of BD-I (45%) or schizophrenia patients (36%),[20] while other studies have reported psychiatrists as the first contact of help.[3,4] A multi-centre study on first care providers of general psychiatric patients (mostly neurotic) reported that the samples from Delhi (42%) and Kerala (74%) had approached psychiatrists as the first service provider and samples at Ranchi (43.4%) had shown a higher reliance on faith-healers.[27]

Table 4: Sociodemographic and clinical variables: group comparisons among group 1, 2 and 3

Variables	Group 1 (1st contact to psychiatrists/psychologists) (*n*=29)	Group 2 (1st contact to nonmedical care provider) (*n*=21)	Group 3 (1st contact to other medical care provider) (*n*=14)	*P*
Age (years)[a]	40.0±11.0	38.0±13.3	35.8±11.5	0.519[c]
Gender[b]				
Male	23 (79.3)	14 (66.7)	9 (64.3)	0.487[d]
Female	6 (20.7)	7 (33.3)	5 (35.7)	
Education[b]				
Up to middle	11 (37.9)	5 (23.8)	1 (7.1)	0.005**[,d]
Higher secondary	4 (13.8)	11 (52.4)	9 (64.3)	
Graduate and above	14 (48.3)	5 (23.8)	4 (28.6)	
Marital status[b]				
Single	9 (31.0)	5 (23.8)	3 (21.4)	0.901[d]
Married	19 (65.5)	14 (66.7)	10 (71.5)	
Others (separated/widow/divorced)	1 (3.5)	2 (9.5)	1 (7.1)	
Religion[b]				
Hindu	27 (93.1)	19 (90.5)	13 (92.9)	1.000[d]
Others	2 (6.9)	2 (9.5)	1 (7.1)	
Family type[b]				
Nuclear	14 (48.3)	13 (61.9)	9 (64.3)	0.551[d]
Joint	15 (51.7)	8 (38.1)	5 (35.7)	
SES[b]				
Upper	2 (6.9)	0	0	0.169[d]
Lower middle	15 (51.7)	7 (33.3)	6 (42.9)	
Upper middle	10 (34.5)	9 (42.9)	3 (21.4)	
Upper lower	2 (6.9)	5 (23.8)	5 (35.7)	
Locality[b]				
Rural	2 (6.9)	4 (19.0)	2 (14.3)	0.001**[,d]
Suburban	18 (62.1)	4 (19.0)	1 (7.1)	
Urban	9 (31.0)	13 (61.9)	11 (78.6)	
Age of onset[a]	26.1±9.2	22.7±6.9	24.6±9.5	0.391[c]
Duration of illness (years)[e]	12 (2-40)	11 (3-40)	10.5 (3-20)	0.818[f]
Family history[b]				
Present	11 (37.9)	4 (19.0)	1 (7.1)	0.082[d]
Absent	18 (62.1)	17 (81.0)	13 (92.9)	
Awareness of psychiatric treatment at the time of the first contact[b]				
Yes	19 (65.5)	2 (9.5)	1 (7.1)	<0.001***[,d]
No	10 (34.5)	19 (90.5)	13 (92.9)	

[a]Mean±SD; [b]*n* (%); [c]*F*-test; [d]χ^2; eMedian (minimum–maximum); [f]Kruskal–Wallis test; **$P=0.01$; ***$P<0.001$. SES – Socioeconomic status; SD – Standard deviation

Common reasons for choosing the first contact for help were a belief in a supernatural power being responsible for symptoms, viewing illness as a 'mind illness'/behavioural symptoms, or recommendation by someone or family doctor/routine care provider. Patients and their families considered the mental health problem to be arising due to supernatural causes. Therefore, they sought help from traditional faith healers. Similar observations have been highlighted by previous Indian studies where families believed that supernatural power is responsible for patients' behaviour.[3,4,19,25] Wherever the symptoms of mania or depression were considered as a result of a physical or medical illness, they sought help from a general physician or alternative medicine practitioner, while if they found the mood symptoms as either a 'mind illness' or 'behavioural problem', they approached a psychiatrist first. The psychiatrist was chosen as the first care provider based on the advice of their family doctor, relatives, neighbour, or friends. Another study too reported similar findings and concluded that, unsurprisingly, the patients or their families would start to discuss illness with friends and relatives when the patient does not improve.[19]

In our study, 17% of the sample had mean DUB of 3.5 years and that is similar to the rate reported by a multicenter study from China.[18] However, studies from other countries have reported longer mean DUB figure of 6.7-20 years.[14-17] The homogeneity of the population and participants with BD-I may partly account for the

inconsistency of the results,[18] because patients with BD-I are easier to identify.[14] Median time to reach a psychiatrist after seeing the first care provider in the present study was three months which was lesser than the time reported in studies by Behari *et al.*[19] and Lahariya *et al.*[20] Previous literature also reported almost similar time that taken by patients with any psychiatric illness to reach a psychiatrist after seeing a first care provider, i.e., less than a month in Japan,[28] 0 to 3 months in Eastern Europe,[29] and six months in Australia.[6] However, these patients took more time to reach the psychiatrist if they first consulted with traditional healers.[20] Surprisingly, a few of our patients still had the intention to continue the faith-healing simultaneously with psychiatric treatment. A study also reported a similar proportion of patients in Delhi (16%) who had an intention to continue the faith healing procedure alongside the medical treatment.[30]

Furthermore, it was observed that majority of patients who had the first contact to non-medical or other medical care provider group were less educated and were unaware of psychiatric treatment at the time of the first contact, as compared to those with the first contact to psychiatrists/psychologists. This may have influenced patient's decision to seek help from different services. A study also reported that a majority of patients who contacted faith-healers first were significantly less educated as compared to patients who sought help from a psychiatrist or other services.[20] Generally, the majority of patients and their family members were not aware of the existence of a mental illness like BD-I at the time of the first contact, which is probably why they took a long route to reach a psychiatrist. Patients who had a family history and awareness about mental illness within the family were most likely to contact psychiatrists first.

The study findings should be contextualised with its strengths and limitations. The strength of the study lies in its being the first Indian study to specifically assess and report the pathways to care in a homogeneous sample comprising of BD-I patients only. The relatively large number of BD-I patients adds to the study strengths. There are a few important limitations of the current study that need to be mentioned and addressed in future studies. First, though this is the first hospital-based study that included more number of patients with BD-I, there is still a need for a larger sample and study in a community setting so that the findings can be generalised. Second, this study was conducted at a tertiary care centre with high medical expertise and easy affordability that attracts patients from all over the country. Different results may be found in a community centre or a multicentric study. Third, multiple hypothesis testing was carried out without any correction. Another important limitation would be recall bias that may happen during the collection of information from the caregivers and the patients in such studies. Though we have tried to assess information from multiple sources and corroborate with family, still, due to the long duration of illness, recall bias is inevitable.

CONCLUSIONS

The first care provider plays a significant role in the direction of the path taken by the patient to reach a mental health professional. In BD-I, patients took treatment from a multitude of healthcare providers including psychiatrists, traditional faith healers, general physicians, and alternative medicine practitioners. In recent years, awareness about mental illness has increased and that minimises the stigma associated with mental illnesses and encourages families to seek help directly from the psychiatrists. However, a certain proportion of families still relies on faith healers due to lower education and has poor awareness within the family and community. Thus, traditional healers should be educated for prompt referral to mental healthcare centers, and general physicians should be trained to manage BD-I to some extent. The study opens a gateway towards understanding the pathways to care adopted by BD-I patients and families, prompting adoption of necessary steps for sensitisation in order to prevent prolonged and undue delays in initiation of appropriate treatment of BD-I.

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Conflicts of interest
There are no conflicts of interest.

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Original Article

Illness Perception of Anxiety Patients in Primary Care in Singapore

Chee Khong Yap, Mei Yin Wong, Kok Kwang Lim[1]

ABSTRACT

Background: The majority of people with anxiety tend to seek help in primary care. Patients' illness perception regarding their own anxiety can influence the assessment, treatment processes, and outcomes. This cross-sectional study explored possible relationships between patients' illness perception of their anxiety and the severity of their anxiety. **Materials and Methods:** Ninety-five patients with anxiety were recruited at two primary care clinics in Singapore. Their responses to the generalized anxiety disorder-7 (GAD-7) and illness perception questionnaire mental health (IPQ-MH) were examined with Spearman's rho correlation coefficients and multiple regression analyses. **Results:** Four illness perception subscales, i.e., *consequences* (r_s = 0.23), *personal control* (r_s = –0.27), *coherence* (r_s = –0.22), and *biological* (r_s = 0.34) significantly correlated to anxiety ($P < 0.05$). A multiple regression analysis identified that attribution to biological factors (β = 0.348, P =0.001) and attribution to personal control (β = -0.262, P =0.008) were significantly associated with anxiety. **Conclusions:** Interventions for anxiety reduction in primary care can be enhanced with methods that promote (1) patients' awareness of the reasons for their anxiety beyond mostly bodily ones to include psychosocial ones and (2) patients' confidence in their own capacity to influence their recovery.

Key words: *Anxiety, biological attribution, cross-sectional study, illness perception, personal control, primary care, regression analysis, Singapore*

INTRODUCTION

A significant population of people with anxiety seeks help in primary care.[1-3] They may present with medical issues associated with anxiety such as irritable bowel syndrome, asthma, cardiovascular disease, and chronic pain.[4,5] In Singapore, the lifetime prevalence of anxiety was estimated to be 0.9%.[6] Anxiety is likely to compromise the quality of life[7] and treatment adherence.[8] For instance, early treatment drop out was observed among patients with anxiety symptoms.[2,9] This highlights the importance of establishing and delivering brief and effective treatment for anxiety patients, especially in primary care.

Understanding patients' perception of their illness is essential to enhancing the assessment and treatment of

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patients with anxiety. Illness perception is a cognitive model of how patients process information about their own health threat. The self-regulation model (SRM)[10,11] has been one of the most empirically tested models in clinical health psychology, psychiatry, and medicine. There are five components in the model, including *identity* (i.e., the perceived nature of the symptoms of the illness), *causes* (i.e., attributions regarding the reasons of the presence of the illness), *timeline* (i.e., the expected duration of the illness), *consequences* (i.e., the perceived impact of the illness), and *cure/control* (i.e., the perceived efficacy of attempts at managing the illness).

Studies have shown that illness perception may influence patients' response to their illness and treatment outcomes. In particular, treatment adherence may be related to perceived negative consequences and sense of personal control.[12] Causal attributions could determine patients' motivation in acquiring coping skills. For example, most patients who ceased their smoking habit had also attributed chronic obstructive pulmonary disease to smoking.[13] Evidence has shown that negative illness perception is associated with complications in the recovery process,[14,15] low health status,[16] and poor quality of life.[17]

Studies on illness perception related to anxiety tend to be conducted for patients with a specific disease such as type-2 diabetes mellitus,[18,19] chronic obstructive pulmonary disease,[20,21] chronic pain,[22] and heart failure.[23] However, illness perception studies on anxiety as a primary presenting problem appear to be underrepresented. In Singapore, anxiety is a common presenting problem, for which illness perception may enhance clinicians' formulations of its underlying factors and development of targeted interventions for the local population.

The aims of the present study were to (1) explore the illness perception of patients with anxiety in primary care in Singapore and (2) investigate the relationships between illness perception and anxiety. Given that past studies reported a significant relationship between illness perceptions and various presentations of anxiety, significant relationships between illness perception and anxiety were hypothesized for the local primary care population.

MATERIALS AND METHODS

Study design

The present study was a cross-sectional study.

Setting

The study was conducted in two primary care clinics in Singapore. Participants of this study were referred by their general physicians to consult a colocated clinical psychologist for anxiety. The clinical psychologists identified patients who were eligible to participate in this study and invited them to participate. The recruitment and data collection were ongoing from December 1, 2015 till July 29, 2016. All data were collected on a single occasion, and no follow-up was required.

Participants

Inclusion criteria for this study were age 21 years and above, and the presence of anxiety symptoms with total score of 5 (i.e., mild anxiety) and above on the generalized anxiety disorder-7 (GAD-7).[24] Patients who exhibited suicide risk or psychotic symptoms were excluded. Participants were recruited by the end of their psychology consultation with a clinical psychologist. They were given adequate time to consider. They were told that their participation was completely voluntary, and they were assured that they would receive treatment as usual in their future consultations even if they did not participate. After written consent was obtained, they were sent to an independent coinvestigator who administered the questionnaires. The coinvestigator collected all data.

The ethical approval (2015/00658) was obtained from the National Healthcare Group Domain Specific Review Board (DSRB) in Singapore. Written consent to participate in this study was obtained from all participants.

Study size

According to the G*Power analysis (based on the effect size of 0.15 as reported by past studies), at least 74 participants were required for this study.

Measures of assessment

Generalized anxiety disorder-7 (GAD-7).[24] The GAD-7 was used to assess the severity of the participant's anxiety. It is a self-report questionnaire that comprises seven items. Respondents are asked if they are affected by seven anxiety symptoms over the past 2 weeks. The response to each item (e.g., "not being able to stop or control worrying") is rated on a 4-point Likert scale. The reliability and validity of GAD-7 have been supported by research.[25,26]

Illness perception questionnaire mental health (IPQ-MH).[27] The IPQ-MH was used to assess patients' illness perception of anxiety. It consists of 12 subscales: *identity*, *timeline chronic*, *timeline cyclical*, *consequences*, *personal control*, *treatment control*, *coherence*, *emotional representation*, *psychosocial causes*, *biological causes*, *structural causes*, and *stress causes*. It reportedly has good internal reliability.[27] In the present study, all subscales of the IPQ-MH showed

adequate internal reliability (Cronbach's alpha ≥0.70), except the *stress causes* subscale. Their Cronbach's alpha values ranged from 0.69 (*stress causes* subscale) to 0.98 (*treatment control* subscale).

The IPQ-MH has a total of 67 items that utilize a 5-point Likert scale. The *identity* subscale includes items that ask whether the participants' main complaints belong to "social and/or relational problems" or "a reaction to circumstances or events." Under the *structure* subscales, the *timeline chronic* items include "These problems will pass quickly." The *timeline cyclical* items include "My problems are very unpredictable." The *consequences* items include "My action cause difficulties for those who are close to me." The *personal control* items include "My actions will have effect on the course of my problems." The *treatment control* items include "The negative effects of my problems can be prevented (avoided) by my treatment." The *coherence* items include "My problems don't make any sense to me." The *emotional representation* items include "When I think about my problems, I get upset." The *causes* subscales include the *psychological* subscale (e.g., "unresolved feelings resulting from the past"), biological subscale (e.g., "a chemical imbalance inside my brain"), structural subscale (e.g., "the lack of supportive communities"), stress subscale (e.g., "experience of serious marital conflict").

Analysis

Data were analyzed by SPSS Version 20.0 for Mac. Shapiro–Wilk tests showed that other than the identity and timeline chronic subscales in the IPQ-MH, the data were not normally distributed ($P < 0.05$). Therefore, nonparametric tests were used for the analysis. Spearman's rho correlation coefficients were applied to explore not only the relationships between the IPQ-MH subscales and the GAD-7 total scores but also, separately, within the IPQ-MH subscales themselves.

To further analyze the relationship between illness perception and anxiety, a multiple regression analysis was conducted with the IPQ-MH subscales (i.e., identity, timeline chronic, timeline cyclical, consequences, personal control, treatment control, coherence, emotional representation, psychosocial causes, biological causes, structural causes, and stress causes) as the potential independent variables and GAD-7 total scores as the dependent variable.

RESULTS

Participant characteristics

A total of 110 patients were screened, and 95 participants were recruited. The median age of the participants (64 females and 31 males) was 51 years (interquartile range was 28). A total of 70 participants reported mild anxiety, 22 reported moderate anxiety and three reported severe anxiety. The median score for anxiety was 8.00, and the interquartile range was 5.00. No significant relationships were found between anxiety and age ($R_s = –0.045$, $P = 0.668$) or gender ($R_s = 0.010$, $P = 0.920$).

Illness perception

In the *identity* subscale, all symptoms were identified by at least one participant as important psychological symptoms. The mean score was 34.67 (SD = 7.44). Anxiety or fear (including avoidance of frightening situations), somatic complaints, cognitive complaints (e.g., lack of concentration, forgetfulness, worrying), and behavioral problems (e.g., overcontrolling, repetitions) were found to be significantly correlated to anxiety [Table 1].

The median scores and interquartile ranges for other subscales are presented in Table 2. There were several significant correlations detected among the structural subscales themselves [Table 3]. *Timeline chronic* positively correlated with *consequences* and *emotional representation* but negatively correlated with *personal control*. *Consequences* positively correlated with *emotional representation*. *Personal control* positively correlated with *treatment control*.

Further, *consequences* positively correlated with anxiety, whereas *personal control* and *coherence* negatively correlated with anxiety [Table 2].

There were several significant correlations among the *causes* subscales *themselves* [Table 4]. The *psychosocial* subscale positively correlated with the *biological*, *structural*, and *stress* subscales. The *biological* subscale positively correlated with the *structural* subscale. The *structural* subscale positively correlated with the *stress* subscale. Among the *causes* subscales, only the *biological* subscale correlated with anxiety [Table 3].

Table 1: Correlations between identity items and anxiety

Items	R_s
Anxiety or fear (including avoidance of frightening situations)	0.275**
Sadness or depression	0.075
Somatic complaints	0.215*
Social and/or relational problems	0.181
Anger or aggression	0.160
Cognitive complaints (e.g., lack of concentration, forgetfulness, worrying)	0.250*
Behavioral problems (e.g., overcontrolling, repetitions)	0.332**
Sleeping problems	0.134
A reaction to circumstances or events	–0.042
A symptom of my disorder	0.151
An expression of my personality	0.085
A result of the way I live my life	–0.103

*$P<0.05$; **$P<0.01$

Further, *consequences*, *personal control*, *coherence*, and *biological* subscales were included in a standard regression analysis to explore their association with anxiety. The model was statistically significant [F (4, 90) = 6.244, $P < 0.0001$] and accounted for approximately 18% of the variance of anxiety (R^2 = 0.217, Adjusted R^2 = 0.182). Anxiety was found to be significantly associated with personal control (β = -0.262, P = 0.008) and biological causes (β = 0.348, P = 0.001).

DISCUSSION

The present findings highlighted the illness perception of patients with anxiety in primary care. Majority of the participants were concerned about mental health symptoms including fear, somatic complaints, cognitive complaints (e.g., lack of concentration, forgetfulness, worrying), and behavioral problems (e.g., overcontrolling, repetitions). Overall, the participants perceived their conditions as moderately chronic with some fluctuations overtime. The participants' tendency to perceive their anxiety as chronic might suggest that they had experienced the anxiety symptoms for some time before seeking professional help. Any fluctuations of anxiety might have contributed to delay in seeking professional help, as they might not think they needed help while they felt better. Similarly, they generally reported a high degree of negative consequences, which could be a reflection of the duration of their condition and emotional distress. They also described themselves as having a meaningful understanding of their anxiety condition. In addition, they expressed a relatively greater sense of personal control and positive perception toward treatment, and both correlated with each other. The negative correlation between personal control and perceived chronicity was consistent with certain negative associations detected in cardiology between self-efficacy and the "stability" component of a pessimistic attributional style.[28]

The present findings highlighted that the four illness perception subscales (*consequences*, *personal control*, *coherence*, and *biological*) are significantly correlated to anxiety. The participants experienced higher anxiety when they perceived a greater negative impact of anxiety on their lives (i.e., *consequences*), lacked confidence in managing their own anxiety symptoms (i.e., *personal control*), held a deficient understanding about their anxiety condition (i.e., *coherence*), or believed that their anxiety resulted from physiological abnormality (i.e., *biological* attribution). Taken together, *consequences*, *personal control*, *coherence*, and *biological* attribution explained 18% of the variance in the anxiety severity. In particular, both *personal control* and *biological* attribution were significantly associated to anxiety, with the latter showing a stronger association.

In contrast to the findings from Costa *et al*.[22] that all *structure* subscales of illness perception were significantly and moderately associated with anxiety in patients with chronic pain, only three *structure* subscales (i.e., *consequences*, *personal control*, and *coherence*) significantly (albeit less than moderately) correlated to anxiety for the Singaporean participants in this study. Findings from this study were consistent with the results reported by Paschalides *et al*.[18] in diabetic patients, which showed marginal correlations between *consequences* and anxiety as well as *personal control* and anxiety, although the significant relationship between timeline and anxiety that was reported in their study did not emerge in our study. Further, the findings of

Table 2: Correlations between IPQ-MH subscales and anxiety

Subscales	Score range	Median	Interquartile range	R_s
Structural subscales				
Timeline chronic	6-30	18.00	8.00	0.187
Timeline cyclical	4-20	14.00	7.00	0.008
Consequences	5-25	19.00	5.00	0.228*
Personal control	6-30	19.00	7.00	–0.268**
Treatment control	3-15	12.00	3.00	–0.080
Coherence	4-20	14.00	8.00	–0.223*
Emotional representation	6-30	23.00	6.00	0.174
Cause subscales				
Psychosocial	5-25	15.00	9.00	0.120
Biological	6-30	15.00	6.00	0.337**
Structural	3-15	6.00	6.00	0.122
Stress	7-35	15.00	10.00	0.009

*$P<0.05$; **$P<0.01$. IPQ-MH: Illness Perception Questionnaire-Mental Health

Table 3: Correlations between structural subscales in IPQ-MH

Structural subscales	1	2	3	4	5	6	7
1. Timeline chronic	1.00	–0.164	0.415**	–0.245*	–0.182	–0.083	0.219*
2. Timeline cyclical	–0.164	1.00	0.039	0.160	0.144	–0.164	0.087
3. Consequences	0.415**	0.039	1.00	–0.190	0.040	0.031	0.477**
4. Personal control	–0.245*	0.160	–0.190	1.00	0.292**	0.038	–0.150
5. Treatment control	–0.182	0.144	0.040	0.292**	1.00	0.092	0.017
6. Coherence	–0.083	–0.164	0.031	0.038	0.092	1.00	–0.060
7. Emotional representation	0.219*	0.087	0.477**	–0.150	0.017	–0.060	1.00

*$P<0.05$; **$P<0.01$. IPQ-MH: Illness Perception Questionnaire-Mental Health

Table 4: Correlations between subscales of causes in IPQ-MH

Subscales of causes	1	2	3	4
1. Psychosocial	1.00	0.213*	0.491**	0.345**
2. Biological	0.213*	1.00	0.218*	0.044
3. Structural	0.491**	0.218*	1.00	0.394**
4. Stress	0.345**	0.044	0.394**	1.00

*$P<0.05$; **$P<0.01$. IPQ-MH: Illness Perception Questionnaire-Mental Health

Morgan *et al*.,[23] who reported a delicate but significant relationship between *personal control* and anxiety in patients with heart failure, was replicated in the present study. The present findings are also similar to those by Howard *et al*.[20] who reported a subtle but significant relationship between *consequences* and anxiety in patients with chronic obstructive pulmonary disease.

Limitations and recommendations

We did not rule out possible comorbidities with anxiety (i.e., anxiety potentially accompanied by other psychiatric conditions or physical diseases). To fine-tune the generalizability of the findings from this study to other primary care settings, it would be necessary to capture larger sample sizes from a more diverse range of primary care clinics with relevant comorbidity information.

Given this preliminary study's cross-sectional design, the test-retest reliability of IPQ-MH was not explored in this study, and the consistency of the patients' illness perception patterns over time could not be determined. Hence, conclusions should not be drawn about causal relationships between illness perception and anxiety severity. As illness perception might impact the severity of anxiety, the illness perception might as well have reciprocally resulted from the anxiety. This study can serve as a basis for longitudinal or even randomized controlled studies that attempt to examine patients' illness perception profiles overtime and the directionality between anxiety and illness perception. In addition, as anxiety was only partially explained by illness perception, qualitative studies would be a justifiable and promising approach to uncovering other important factors associated with primary care patients' anxiety.

Implications

This preliminary study demonstrated that meaningful patterns of patients' views and experiences of anxiety in primary care in Singapore could be detected and analyzed with IPQ-MH. Patients' perception toward *consequences*, *personal control*, understanding of the condition, and attribution to *biological* factors were shown to be associated with the severity of anxiety, with *biological* attribution, and *personal control* as significant contributing factors of anxiety severity.

These findings can enhance clinical formulation and interventions for patients with anxiety. Psychoeducation on their anxiety condition that equally emphasizes biological, psychological, and social factors would be helpful in making their largely physiologically inclined views less rigid and thus more balanced and resourceful in addressing other determinants of their anxiety as well. While interventions that target physiological reactions to anxiety (e.g., relaxation techniques and pharmacological prescriptions) may be routinely recommended for primary care patients, their *personal control* can be heightened with strategies that capitalize on the patients' sense of internal locus of control (i.e., confidence in their own capacity to influence outcomes of their anxiety condition). Accordingly, psychotherapeutic approaches such as strength-based cognitive-behavioral therapy[29] and solution-focused therapy[30] may foster patients' own confidence and problem-solving capabilities in attaining sustainable anxiety reduction.

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Conflicts of interest

There are no conflicts of interest.

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Original Article

Sexual Dysfunction among Men in Rural Tamil Nadu: Nature, Prevalence, Clinical Features, and Explanatory Models

K. S. Vivekanandan, P. Thangadurai, J. Prasad[1], K. S. Jacob

ABSTRACT

Background and Aim: There is a dearth of community data on nature, prevalence, clinical features, and explanatory models related to sexual dysfunction among men, particularly from rural India. This study attempted to examine different aspects of male sexual dysfunction and misconceptions in the community. **Materials and Methods:** Villages in Kaniyambadi Block, Vellore district were stratified, and four were randomly selected. Men living in these villages were recruited for the study. The following instruments were administered: (i) International Index of Erectile Function, (ii) Chinese Index of Premature Ejaculation (iii) Short Explanatory Model Interview, and (iv) Revised Clinical Interview Schedule. The data were analyzed using standard bivariate and multivariate statistics. **Results:** A total of 211 men were recruited. The majority were middle-aged (mean 40.73 years), literate (84.8%), married, and with children (72%), from nuclear families (99.6%), followed the Hindu religion (87.7%), reported satisfaction with their marriage (51.2%), had a single sexual partner (99.5%), and practised contraception (88.2%). A minority reported erectile dysfunction (29.9%), premature ejaculation (19.4%), and depression/anxiety (30.8%). Erectile dysfunction was associated with single marital status ($P < 0.001$), premature ejaculation ($P < 0.001$), worry about nocturnal emission and loss of semen ($P < 0.02$), and punishment by God as causal beliefs ($P < 0.001$). Premature ejaculation was associated with diabetes mellitus ($P < 0.05$), alcohol use ($P < 0.05$), anxiety and depression ($P < 0.01$), guilt about masturbation ($P < 0.001$), and belief that nocturnal emission is causal ($P < 0.001$) and erectile dysfunction ($P < 0.05$). **Conclusion:** Sexual misconception and dysfunction in men are significant problems in rural communities in India. They mandate the need for sex education in schools and the empowerment of physicians in primary and secondary care to manage such problems.

Key words: *Community, erectile dysfunction, India, premature ejaculation, psychiatric morbidity*

INTRODUCTION

Sexual disorders are complex, diverse, and associated with multiple biological, medical, and psychological factors. Sexual dysfunction is common among men who attend general hospitals.[1] However, it is often

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not recognized, diagnosed, and managed.[1] While hospital-based studies have been done,[1-3] data on male sexual dysfunction in the community from the Indian subcontinent are very limited.[4-6] Rao *et al*. examined sexual dysfunction in rural Mysore and reported erectile dysfunction (15.77%), premature ejaculation (8.76%), and hypoactive sexual desire disorder (2.56%) in the population.[4] Nevertheless, there is a dearth of data on sexual dysfunction among men from rural India in general and Tamil Nadu in particular. We attempted to estimate the prevalence and nature of male sexual dysfunction in a rural community of Tamil Nadu and to elicit the explanatory models of illness and risk factors. It also attempted to study the relationship between sexual dysfunctions and sexual misconceptions.

MATERIALS AND METHODS

Setting

The institution has been working in Kaniyambadi block for the past 50 years. This region in Tamil Nadu is a geographically defined area of 127.4 sq. km, with a population of about 1,10,000. The community health programme operates in all villages in the area. A large proportion of the population is from the lower socioeconomic strata. Agriculture and animal husbandry are the major occupations.

Sample

Kaniyambadi block was stratified based on the median distance from Vellore town. Four large villages, out of 85 villages, were randomly selected, with two villages being close to Vellore and two farther away. Men above the age of 18 years who spoke Tamil, the local language, were eligible for the study. The researcher went to the center of each village and contacted 50 consecutive men. A community health worker introduced the researcher (KSV) to the subjects, explained the details of the study, assured confidentiality, and obtained informed consent. This study was neither part of a camp nor was it advertised.

Assessment

The following instruments were employed:

(i) *International Index of Erectile Function (IIEF-5)*: This instrument is regarded as the 'gold standard' measure to assess treatment outcome for clinical trials in erectile dysfunction, regardless of the type of treatment, intervention, or study population under investigation.[7-9] It has been linguistically validated and is currently available in 32 languages worldwide. IIEF-5, an abridged five-item version of the IIEF,[10-13] was developed and has been separately validated as a brief, easily administered diagnostic tool. This scale is available in Tamil and has been used locally.[1,3] The threshold of 5–7 was used to determine caseness[11]

(ii) *Chinese Index of Premature Ejaculation (CIPE-5)*: CIPE-5 is an abridged version of CIPE, which has been found to be as sensitive and specific as the longer version.[14] CIPE-5 focuses on ejaculatory latency, difficulty in delaying ejaculation, sexual satisfaction of patient, sexual satisfaction of partner, and feelings of anxiety or depression in sexual activity. The scale is available in Tamil and has been used in local investigations.[1] The threshold of less than 9 was used to determine caseness[14]

(iii) *Sexual History Interview*: This interview focuses on questions which are part of routine clinical examinations. Details related to patterns of sexual behavior, beliefs about sexual activity, and opinions about contraception and HIV/AIDS, which were not part of the IIEF-5 and the CIPE-5 but which were relevant to a comprehensive assessment, were included. The structured format provided uniformity in data collection. The tool has been used in earlier investigations and is available in Tamil[1]

(iv) *Short Explanatory Model Interview (SEMI)*:[15] The interview, based on Kleinman's original concepts, explores emic perspectives of illness and employs open-ended semistructured questions. The subjects are encouraged to talk openly about their attitudes and experiences, with the aim of eliciting concepts held and their relationship to current situations and culture. The interview uses open-ended questions to examine the nature of the presenting problems; their causes, impact, and severity; help-seeking; and the expectations of treatment. It employs probes to explore different issues. It records verbatim responses. Its format also allows for qualitative and quantitative analyses. Major themes are identified and recorded and are analyzed semiquantitatively and coded dichotomously as present/absent. The method of analysis has been standardised. The SEMI takes 20–30 min to complete. The nontechnical nature of the instrument allows for the translation and adoption into different languages for use in different cultures. The SEMI has been used and translated into many languages, including Tamil,[16,17] and has been employed to study sexual concerns in Vellore[1,18]

(v) *Revised Clinical Interview Schedule (CIS-R)*:[19] This is a standard instrument to assess anxiety, depression, and common mental disorders. It is a semistructured interview and has algorithms to arrive at an International classification of diseases (ICD) 10 diagnosis. It has been translated into many languages and has been used across different cultures and countries. The Tamil version has been employed in many studies.[20,21] The threshold of 11/12 was employed to determine psychiatric caseness.[19]

(vi) *A Special Proforma was Used to Obtain Sociodemographic and Clinical Details:* It included age, marital status, residence, education, occupation, income, diet, and history of physical and psychiatric illness and substance use.

A trained psychiatrist (KSV) administered all the instruments.

Statistics

Mean and standard deviation were used to describe continuous variables, while frequency distributions were obtained for categorical data. The *Chi*-square test and Student's *t*-test were employed to assess the significance of bivariate associations for the categorical and continuous variables, respectively. Logistic regression analysis was used to adjust for age and marital status. Odds ratio (OR) and 95% confidence interval (CI) were calculated. Statistical Package for Social Sciences (SPSS) version 16 was used to analyze the data.

The following formula and estimates were used to calculate sample size:

$1.96 \times 1.96 \times pq/d^2$ where P is prevalence, q = (100-p) and d is precision. The prevalence estimate of 48% and precision of 7% were taken from a study done in the region.[1] The sample size obtained was 196.

The study protocol was approved by the Institutional Review Board.

RESULTS

A total of 213 were contacted and 211 (99.06%) agreed to be interviewed. And 90% of the subjects who participated were interviewed alone and in the privacy of their homes. The rest were interviewed in public spaces, but without the presence of other people. The interviewer waited for the subjects to be alone prior to asking questions and paused the interview if interrupted.

The sociodemographic and clinical characteristics are documented in Table 1. The majority were middle-aged men, literate, married and with children, from nuclear families, followed the Hindu religion, reported satisfaction with their marriage, had a single sexual partner, and practised contraception. A minority reported erectile dysfunction, premature ejaculation, or other problems with sexual function.

Table 2 records the factors associated with erectile dysfunction. On bivariate analysis, erectile dysfunction was associated with age, marital status, number of children, alcohol use, worry about nocturnal emission, guilt due to masturbation, and viewing it as a punishment by God. As age and marital status were related to erectile dysfunction, they were included in the multivariate analysis to adjust for their confounding effects. The factors which remained statistically significantly associated with erectile dysfunction after multivariate analysis using logistic regression, which adjusted for the effects of age and marital status, were single marital status, premature ejaculation, worry about nocturnal emission and loss of semen, and punishment by God as causal belief.

Table 1: Sociodemographic, clinical, and sexual profile of sample

Characteristic	Frequency (%) mean (SD)
Sociodemographic and clinical profile	
Age (in years)	40.73 (13.55)
Literacy-Illiterate	32 (15.2)
Family-Nuclear	210 (99.6)
Monthly family income (in rupees)	7027 (6540)
Religion-Hindu	185 (87.7)
Marital status-single	48 (22.7)
Married with children	152 (72)
Diabetes	11 (5.2)
Hypertension	10 (4.7)
Alcohol use	65 (30.8)
Nicotine use	22 (10.4)
Sexual history	
Satisfaction with sexual functioning present	7 (3.3)
Reduction in sexual desire reported	38 (18.0)
Problems with orgasm reported	52 (24.6)
Pain during intercourse reported	3 (1.4)
Single partner	210 (99.5)
Satisfaction with marriage	83 (51.2)
Use of condoms	7 (3.3)
Contraception - Partner using Intrauterine contraceptive device (IUCD), oral, surgical sterilization	186 (88.2)
Source of initial knowledge about sex	
Friends	19 (9.0)
Relatives	48 (22.7)
Books	9 (4.3)
Magazines	4 (1.9)
Movies	18 (8.5)
Experience within marriage	11 (5.2)
Experience outside marriage	102 (48.3)
Masturbation	37 (17.5)
Worry about loss of semen	16 (7.6)
Purpose of sex (multiple responses)*	
For procreation	15
For recreation	175
A sin	0
A duty	19
Clinical variables	
Erectile dysfunction	63 (29.9)
Premature ejaculation	41 (19.4)
Revised clinical interview schedule (CISR) case-depression anxiety	65 (30.8)

Table 2: Factors associated with erectile dysfunction

Factor	Erectile dysfunction Case *n*=63 Mean (sd) No. (%)	Erectile dysfunction noncase *n*=148 Mean (sd) No. (%)	Bivariate statistics *t* value; df, *P* χ^2;df; *P*	Multivariate statistics adjusted for age and marital status OR; 95% CI; *P*
Age (in years)	31.90 (14.60)	44.49 (11.16)	**−6.12; 94.22; <0.001**	1.03;0.98-1.07;0.25
Marital status-single	44 (69.84)	4 (2.70)	**113.3; 1; <0.001**	**143.87;32.1-644.8; <0.001**
3 or more children	12 (19.05)	103 (69.59)	**45.53; 1; <0.001**	0.47;0.15-1.43; 0.181
Alcohol use	12 (19.05)	53 (35.81)	**5.83; 1; 0.01**	1.07;0.41-2.77; 0.889
Premature ejaculation	16 (25.40)	25 (16.89)	2.04; 1; 0.15	**5.16; 1.91-13.97; 0.001**
Belief that nocturnal emission as causal	9 (14.29)	3 (2.03)	**12.38;1;<0.001**	**11.58; 1.60-83.8; 0.015**
Belief that masturbation as causal	7 (11.11)	2 (1.35)	**10.31; 1;0.001**	8.08; 0.72-90.24; 0.090
Belief that punishment from God as causal	5 (7.94)	2 (1.35)	**5.97; 1; 0.015**	**26.97;4.13-176.2; 0.001**

The following variables were not significantly related to erectile dysfunction: literacy, family type, individual income, family income, and family history of mental illness, diabetes, hypertension, psychiatric case-depression and anxiety, reduced libido, orgasm, painful intercourse, multiple partners, protection from STD/HIV, contraception, medical or nursing consultation, causation due to black magic, karma, and diet

Table 3: Factors associated with premature ejaculation

Factor	Premature ejaculation Case *n*=41	Premature ejaculation noncase *n*=170	Bivariate statistics *t* value; df *P* value χ^2;df; *P* value	Multivariate statistics adjusted for age and marital status OR; 95% CI; *P*
Age (in years)	45.07 (13.46)	39.69 (13.40)	**2.31; 209; 0.022**	0.97; 0.94-1.003; 0.078
Marital status-single	6 (14.63)	42 (24.7)	1.91; 1; 0.167	1.03; 0.997-1.06; 0.078
Erectile dysfunction	18 (43.9)	63 (37.06)	0.658; 1; 0.42	**2.29; 1.006-5.21; 0.048**
Diabetes mellitus	6 (14.3)	5 (2.9)	**9.14;1; 0.003**	**4.05; 1.07-15.0; 0.039**
Alcohol use	19 (46.3)	46 (27.1)	**5.76; 1; 0.016**	**2.08;1.007-4.3; 0.048**
Anxiety or depression present	22 (53.7)	44 (27.1)	**11.86; 1; 0.001**	**2.86; 1.37-5.98;0.005**
Guilt due masturbation	6 (14.6)	3 (1.8)	**13.4; 1; <0.001**	**30.74; 5.54-170.6; <0.001**
Belief that nocturnal emission as causal	8 (19.5)	4 (1.8)	**18.14; 1; <0.001**	**35.31; 7.36-169.4; <0.001**

The following variables were not significantly related to premature ejaculation: literacy, family type, individual income, family income, and family history of mental illness, hypertension, psychiatric case-depression and anxiety, reduced libido, orgasm, painful intercourse, multiple partners, protection from STD/HIV, contraception, medical or nursing consultation, causation due to black magic, karma, and diet

Table 3 records the factors associated with premature ejaculation. Premature ejaculation was associated with age, diabetes mellitus, alcohol use, anxiety and depression, guilt about masturbation, and belief that nocturnal emission and loss of semen are causal. These and erectile dysfunction were significant on multivariate analysis using logistic regression to adjust for the effects of age and marital status.

DISCUSSION

This study adds to the limited data from rural India. While Rao *et al*. studied sexual dysfunction in a single village,[4] this study examined sexual problems among a sample of men drawn from an administrative block. In addition, it also examined common mental disorders, common risk factors, and explanatory models related to sexual problems. While the majority of men who participated in the community survey did not report sexual dysfunction, a minority (20%–30%) reported different sexual problems. The results of this study document a slightly higher proportion of men with sexual dysfunction when compared to the study by Rao *et al*.[4] The dearth of community data from India prevent comparison across India, but the number of men reporting sexual problems demand the need for systematic and multicentered epidemiological studies to document sexual problems across the country. Nevertheless, the presence of sexual problems also suggests the need for empowering primary care physicians in managing sexual dysfunctions presenting to primary and secondary hospitals and identifying people with severe problems for specialist referral.

The correlation between sexual problems and sexual misconceptions demands comment. The culture of the Indian subcontinent in general and systems of indigenous medicine in particular tends to explain a variety of somatic symptoms using sexual idioms. The *dhat syndrome* typifies common clinical presentations related to sexual concerns among men who attribute weakness, somatic, and psychological problems to the loss of semen through nocturnal emission, masturbation, sex, etc. These findings, also commonly documented in hospital samples,

mandate interventions like education related to sex and sexual functioning for adolescents and adults.

The lack of emphasis -and expertize within primary and secondary care means that men with sexual concerns shop for healing and cure, making them vulnerable to exploitation.[1] Many indigenous systems of medicine tend to favor sexual explanatory models for common mental disorders, particularly in men who present with clinical features of dhat syndrome. Reinforcing sexual misconceptions related to masturbation and nocturnal emission only increase sexual anxiety and is counterproductive. Similarly, the focus on medication and organic remedies for premature ejaculation, which is easily managed with specific suggestions, actually takes away the confidence required for successful performance.

The association between common mental disorders (e.g., anxiety and depression) on the one hand with sexual dysfunction on the other also merits comment.[1] The cross-sectional nature of the study design prevents us from commenting on the direction of causality. Sexual dysfunction can produce symptoms of depression, anxiety, and explanatory models and vice versa. In addition, antidepressant medications are well known to cause sexual dysfunction. The reluctance by patients and physicians to discuss sexual issues, which are considered sensitive or embarrassing, complicates the matter. The perception that sexual problems are not 'serious', and inadequate physician skill and confidence in managing these problems contribute to poor clinical practice. The excessive reliance on culturally acceptable, traditional forms of treatments/resources (e.g., traditional healers) and alternative systems of medicine often lead to underreporting of these symptoms in healthcare settings.

These findings also mandate sex education in high schools and colleges to teach issues related to anatomy and sexual function in order to reduce misconceptions and empower young men. The mass media should also be harnessed to educate people about sexual function.

The strengths of the study include a stratified sampling of villages, standard assessments, and multivariate analysis to adjust for common confounders. Its limitations include the use of brief assessments and the fact that consecutive men available in the village were recruited, rather than through a house-to-house survey. Although confidentiality was assured, the possibility of socially desirable responses cannot be fully excluded.

CONCLUSION

Sexual misconceptions and dysfunction are common in the community; however, they are rarely discussed, diagnosed, or managed in primary and secondary care. Sex education in schools is mandatory to reduce sexual misconceptions in society. It is essential that physicians are empowered and comfortable discussing issues related to sex with patients to allow for appropriate intervention and management.

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Conflicts of interest

There are no conflicts of interest.

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Brief Communication

Early Diagnosis and Intervention for Autism Spectrum Disorder: Need for Pediatrician–Child Psychiatrist Liaison

Harshini Manohar, Preeti Kandasamy, Venkatesh Chandrasekaran[1], Ravi Philip Rajkumar

ABSTRACT

Background: Early interventions in children with autism spectrum disorder (ASD) reduce progressive symptom development. Delay in diagnosis and initiation of ASD-specific interventions is observed across settings. This study aimed to assess the trends in time to diagnosis and treatment initiation in a tertiary care pediatric setting. **Methodology:** Families of children with ASD ($n = 50$) were assessed, and details regarding age at first symptom recognition, medical consultation, receiving the diagnosis, and initiation of treatment were collected, in addition to detailed clinical assessment. **Results:** About 70% of families met a pediatrician for initial concerns, and 20% received a diagnosis of ASD from the first-contact pediatrician. The mean age at initial symptom recognition was 22.22 ± 9.47 months, whereas the first consultation was 27.22 ± 10.83 months. The mean age at initiation of ASD-specific interventions was 36.58 ± 10.2 months, amounting to an overall delay of 14.38 months from initial symptom recognition to treatment initiation. The time delay in our study is found to be lesser compared with similar studies across settings. **Discussion:** Pediatricians have a significant role to play in early diagnosis and care of children with ASD in close liaison with child psychiatry teams. Improving awareness, routine screening, and prompt referral of children "at-risk" for ASD are imperative. Initiating ASD-specific interventions in pediatric or primary care settings is an effective alternative to curtail the delay in treatment initiation.

Key words: *Autism spectrum disorder, delay, early intervention, pediatric*

INTRODUCTION

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by persistent deficits in social interaction and communication and restricted, repetitive patterns of behavior, interests, or activities.[1] Recently, there has been an increasing worldwide prevalence of ASD, with an estimate of about 0.5%–1%,[2] and ASD is considered an issue of public health importance. The rising trends in prevalence are partly attributed

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to increasing awareness among medical professionals, community stakeholders, and, more importantly, parents; and better identification and prompt referral to experts for further management.[3]

Accumulating evidence suggests that early diagnosis and initiation of appropriate interventions in children with ASD result in an optimal outcome[4] and prevent progressive symptom development. Despite increasing awareness and earlier age at diagnosis, delay in initiation of specific interventions has been observed across settings. Indian studies have shown an average delay of 2 years from the point of the first consultation to treatment initiation.[5,6] Strategies such as streamlining the process of consultation and referral,[7] initiation of home-based interventions,[6,8] and changes in public health policies[9] have been proposed to curtail the delay.

As early detection often does not translate into early intervention, it is necessary to understand the reasons for treatment delay and formulate strategies to address the same. Studies in the Indian settings have been conducted in tertiary care child psychiatry and community settings. This study looked at the age at recognition, diagnosis of ASD, and initiation of specific interventions in a tertiary care pediatric setting, as pediatricians continue to be the first-contact medical professionals.

METHODOLOGY

The study was conducted in the Child Guidance Clinic (CGC) of a tertiary care center in South India. The CGC is housed in the Department of Pediatrics, runs in liaison with the child psychiatry team, and caters to about 200–300 children a month. Fifty children with a diagnosis of ASD according to DSM 5,[1] with a reliable informant (parent/grandparent), were consecutively recruited. Informed consent was obtained from parents. The study was approved by Institute Ethics Committee.

Primary caregivers, mostly the mothers, were interviewed using a semi-structured proforma for the sociodemographic profile, child's age at first symptom recognition, first symptom or developmental deviance of concern, age at first consultation, age at receiving the diagnosis of ASD, further consultations if any, and age at initiation of ASD-specific interventions. Details of the source of referral and referral diagnosis were collected. Parents were also asked about the reasons for the delay in treatment initiation. This was done in addition to diagnostic workup, comprehensive evaluation, and initiation of center-based and home-based interventions for these children.

Statistical analysis

All statistical analysis was carried out using SPSS version 19.0. Categorical variables are represented as frequencies and percentages. Continuous variables are represented as means and standard deviations. Correlation between the educational status of parents and age at first symptom, diagnosis, and treatment initiation was done using Pearson's correlation.

RESULTS

Of the 50 children, 84% were male, and 96% had the mother as the primary caregiver. About 22% and 38% of the families belonged to lower and middle socioeconomic status, respectively, whereas 40% belonged to higher socioeconomic status. About 45% of families belonged to the urban background, 20% of parents were professionals, while 64% of mothers were housewives. The mean age of the children was 41.46 ± 17.2 months. The average educational status of the primary caregiver as the number of years of schooling was 12.86 ± 3.8.

Figure 1 shows the average age at symptom recognition to diagnosis and treatment initiation. In our study, though the age at initial symptom recognition was at an average of 22.22 ± 9.47 months, age at first consultation was 27.22 ± 10.83 months, the time delay ranging from 0 to 40 months. The age at receiving the diagnosis of ASD was 32.4 ± 10.1 months, whereas the age at initiation of ASD-specific interventions was 36.58 ± 10.2 months, the time delay ranging from 0 to 60 months. This amounts to an overall mean delay of 14.38 months from the point of initial symptom recognition to treatment initiation.

Around 22% of the children were referred to the CGC by pediatricians, 8% and 2% by a speech therapist and occupational therapist, respectively, whereas 68% were self-referred. A total of 35 (70%) children received the diagnosis of ASD for the first time at our center. Of the remaining 30%, about 20% was diagnosed by pediatricians and 10% by speech and language therapist. Around 26% of children were referred with a diagnosis of attention deficit hyperactivity disorder,

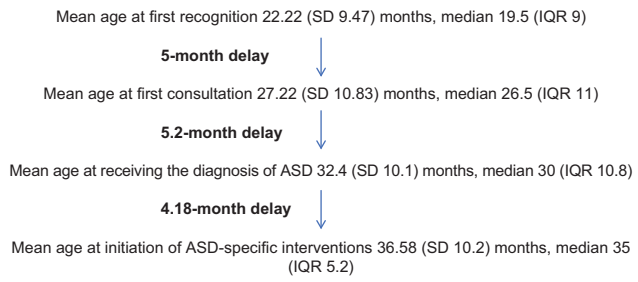

Figure 1: Age at recognition to treatment initiation

34% as suspected ASD, and 3% as expressive language delay, who on further evaluation received a diagnosis of ASD.

The reasons for the first consultation were speech delay in 48% and speech and social milestone regression in 4%. About 52% of families reported concerns such as poor eye contact, poor response to name call, and social interaction, whereas 6% reported motor stereotypies. About 30% of families had primary concerns about hyperactivity and 40% had primary concerns about epilepsy during their first consultation.

It is important to note that 70% of families chose to meet a pediatrician for their initial concerns, of which 20% received a diagnosis of ASD from their first-contact pediatrician. Around 40% of families had taken subsequent consultations and had met a median of 2 (interquartile range 2) professionals after receiving the first diagnosis. Subsequent consultations were obtained from other pediatricians, pediatric neurologists, ENT specialists, psychologists, and speech and occupational therapists. Approximately 40% of parents were in the phase of denial and hence took multiple consultations to seek reassurance. About 8% of parents had a false sense of security that "things would get better as the child grows up," thus delaying treatment, and 4% reported that they were unaware that these are developmental deviances.

About 36% of families initiated ASD-specific interventions within the same month of receiving the diagnosis; an additional 12% initiated interventions within 2 months of diagnosis. There was no correlation between parental education and age of symptom recognition or the first consultation. However, there was a negative correlation between parental education and age at final diagnosis ($r = -0.282$, $P = 0.048$) and time delay in treatment initiation ($r = -0.323$, $P = 0.022$).

DISCUSSION

The delay in treatment initiation following diagnosis has been observed both in Indian and international settings.[5,10] A review of studies conducted over a period of 12 years reported that the mean age at diagnosis was 38–120 months, with a decreasing trend over time.[7] A community-based study in urban India found that the average age at initial symptom recognition was 24.1 months and parents waited at least 2 years from the point of first medical contact to the final diagnosis.[5] A tertiary care hospital-based study found that the mean age at first medical consultation in these children was 32.5 months, whereas age at initiation of disorder-specific treatment was 52.75 months.[6] A finding unique to our study is that age at diagnosis and treatment initiation is earlier by 1.5–2 years compared with studies within the same cultural context. It could be argued that these children first presented to the pediatric clinic. Prompt referral and close liaison with the child psychiatry team could have possibly led to an earlier initiation of interventions.

Pediatricians continue to remain the first-contact professionals in both primary and tertiary care settings.[11] It is recommended that first-contact medical professionals screen and refer children as early as possible whenever there is a concern of developmental deviance.[6] Routine screening for developmental deviance with instruments such as Trivandrum Development Screening Chart,[12] with particular emphasis on social milestones, and using specific screening tools for early detection of ASD like Modified Checklist for Autism in Toddlers – Revised[13] can facilitate early identification.

In resource-limited settings, there is a lack of a hierarchical referral system, compounded by lack of specialists. ASD-specific interventions are delivered in specialized centers in apex institutes and hospitals in urban areas. Alternately, initiating center-based interventions in pediatric or primary care settings are a further step forward to curtail delay in treatment initiation.[14]

In this study, children with various referral diagnoses were later identified to have ASD on detailed evaluation. This raises the importance of specifically looking for comorbid neurodevelopmental disorders in children presenting with developmental concerns. Presence of medical comorbidities and delay in motor development resulted in earliest consultations. Despite 50% of families having noticed deviances in social milestones, consultation was primarily delayed in the absence of medical comorbidities.

Irrespective of parental educational status, developmental concerns were noted at an earlier age. Parents with better educational status had spent lesser time seeking further consultations and initiated interventions earlier. Another aspect to delay in treatment initiation is parental stress in the early stages of receiving the diagnosis. Families of children with ASD undergo significant distress at personal and social levels.[15,16] This emphasizes the need for more awareness among parents,[9] clarifying misconceptions, and addressing parental stress from a cultural perspective.[8]

The small sample size and lack of use of structured interviews for diagnostic ascertainment are the limitations of the study.

CONCLUSION

Pediatricians have a significant role to play in the early diagnosis and care of children with ASD in close liaison with child psychiatry teams. Initiating specific interventions for ASD at the primary care or pediatric setting is an effective alternative to curtail delay in treatment initiation and improving outcomes as well as to address parental stress. Strengthening the CGCs in existing government teaching hospitals and District Early Intervention Centers would be effective to improve service delivery.

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Conflicts of interest
There are no conflicts of interest.

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Commentary

Psychiatrist's Perspective: Invited Commentary on "Early Diagnosis and Intervention for Autism Spectrum Disorder: Need for Pediatrician–Child Psychiatrist Liaison"

Early identification and intervention are vital in the management of neurodevelopmental disorders (NDDs), including autistic spectrum disorders (ASD). Unfortunately, delay in identification and further delay in intervention are the norms in clinical practice. Duration of untreated ASD is a variable that predicts poor outcome.[1] This delay may be due to factors such as a lack of knowledge and awareness among parents, health professionals, and teachers; the stigma of attending a psychiatric service; cultural factors; "everything will be alright as the child grows up" attitude; and lack of facilities accessible to the children in need. Identifying the relative importance of these factors is vital from a public health point of view.

Manohar *et al*.[2] has looked into the temporal trends from the earliest symptom recognition through pediatric consultation and time of diagnosis to time of the first specific intervention. The figures brought out are somewhat comforting than the ones published in previous studies.[3] This perhaps reflects the better awareness created in the recent times. However, the data drawn from a population referred to a tertiary-level specialized center is unlikely to represent the real-world scenario in primary or community care.

Even in these favorably biased data, the mean delay from the first medical contact to a specific intervention is an unacceptable 9.4 months. This delay brings up some important questions: What are the causes of the delay for diagnosis at the point of first consultation? What contributed to the delay from diagnosis to the initiation of specific intervention? Had this study addressed these questions, it would have brought up system gaps and deficiencies which contributed to the long duration of untreated ASD and would have justified the title "Need for paediatrician-child psychiatrist liaison."

Assessment, diagnosis, and interventions of NDDs are among the core competencies of psychiatrists. Psychiatrists' location in the first assessment point of children suspected to have NDDs would significantly cut short the costly delay in diagnosis and initiation of specific therapies. At this point, the factors which prolong the duration of untreated ASD, such as the parental grief, denial, and "everything will be alright as the child grows up" attitude, should be tackled with the professional expertise of a psychiatrist.

Pediatricians, the natural first contact of children with probable NDDs, should be trained to screen for these disorders. This mandatory screening for NDDs at regular intervals in infancy and toddler period, using standardized tools, should be established as a government policy. Psychiatrists should be competent not only to diagnose NDDs but they should be confident to give leadership to the multidisciplinary interventions in close liaison with his/her fellow medical professionals from pediatrics. In clinical practice, many comorbidities such as attention deficit hyperactivity disorder, obsessive compulsive disorders, disruptive disorders, and emotional disorders are widely encountered with ASD. Psychiatrists' role is indispensable in such clinical scenarios. Future psychiatrists and pediatricians should arm themselves with the competencies, skills, and attitudes needed for the collaborative work demanded from them in this interdisciplinary area. Working together, and not cross consultation to the psychiatrist or pediatrician, is the model to be promoted in child mental health. The workforce composition of Early Interventions Centers should be in accordance with this principle. Limiting the psychiatrists' role to one among the several medical consultants would be a disservice to children with ASD.

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Comments on "Leisure Time Physical Activity and Risk of Developing Depression among the Youth of Kangra District, Himachal Pradesh, India"

Sir,

Singh *et al.*[1] studied the association between leisure-time physical activity and the cross-sectional prevalence of depression among the youth of Kangra district in Himachal Pradesh. Although this was a prospective study, they used only a single measure of physical activity and only a single measure of depression, and they examined very few confounding and mediating variables. Given that the association between physical activity and mental health has been known for decades,[2,3] their study breaks no new ground.

Curiously, although they sampled adults, they administered the Center for Epidemiologic Studies Depression Scale for Children. Besides being inappropriate for adults, this instrument has not been validated in the Indian population, and there is no support for the validity of the score used to define caseness in the Kangra sample. This scale has also been criticized for being non-specific, with ill-defined cut-off values.[4]

Further, by excluding persons with diagnosed mental health problems, the authors might have excluded depression, which was the very outcome that they sought to identify using their screening instrument.

Finally, they operationalized leisure-time physical activity and depression scores as categorical variables instead of as continuous variables; categorization of continuous data in statistical analysis has many limitations and should not be performed unless there are specific reasons to do so.[5,6]

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Conflicts of interest
There are no conflicts of interest.

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Authors' Responses to the Comments on "Leisure Time Physical Activity and Risk of Developing Depression among the Youth of Kangra District, Himachal Pradesh, India"

Sir,

We thank Suhas *et al*.[1] for their interest in our article.[2] The authors of the letter have used the term "prospective study," which does not seem appropriate to us. Although the characteristic or exposure (leisure time physical activity) is being studied at the time of the study, it becomes a cross-sectional study.

Their critical comment on using less number of confounders is valid. However, it is important to note that the setting where the study participants were approached was in itself a limitation because of which the socio-demographic details of the family cannot be elicited. We agree that the study breaks no new grounds in the field of studies on physical activity and mental health, but the majority of studies have been conducted in a socio-cultural environment different from India, especially this part of the country (sub-Himalayan region). Factors affecting mental health differ in different settings. Hence, to proceed with any intervention, we needed a ground work on the same in this region. Therefore, to that extent, this study is a useful addition to the medical literature.

We also agree that the scale has not been validated for our country and that different cut-offs have varying sensitivity and specificity. The shorter version (10-item scale) is generally used for late-life depression.[3] We intentionally used the original scale to introduce all the items to the study participants. The primary reason for doing this was that this study would serve as a base for further validating the scale in our settings.

According to the authors of the letter, the participants with depression should not have been excluded from the study. We, however, differ from this statement as the chronic morbidity and mental illness of any type will skew our data toward depression, giving a false result in favor of increased depression. Our objective was to study an apparently healthy population. The categorization of physical activity and depression scores was done to compare the results with other studies. However, we presented the mean scores of depression scale score in our results. We do agree that categorization of continuous variables may increase the possibility of type two error.

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There are no conflicts of interest.

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Comments on "Prevalence and Predictors of Abuse in Elderly Patients with Depression at a Tertiary Care Centre in Saurashtra, India"

Sir,

This correspondence is made in reference to the original article, "Prevalence and predictors of abuse in elderly patients with depression at a tertiary care centre in Saurashtra, India" by Patel *et al*.[1] The paper explored the prevalence of abuse in elderly patients, including its various socio-demographic variables that could predict its possibility.

The study is an important contribution to the limited data available regarding the abuse of elderly population in India. As this study has been done on a specific group of elderly people, those suffering from major depressive disorder (MDD) with exclusion of those with sensory or cognitive impairment, it would have been better if the study mentioned the need or significance of studying the problem of abuse in this group compared to the rest of the elderly patients. Moreover, excluding all patients with cognitive impairment will exclude not only patients with dementia but also those with depression whose cognitive impairment is not because of dementia but due to pseudo-dementia, a temporary condition, a part of depression itself.

We could not find in the study how many elderly depressed patients were excluded because of their score being <25 in Mini-Mental State Examination (MMSE), the tool used in this study to rule out patients with cognitive impairment. There are a few concerns about the use of MMSE and its score of 25 as the cut-off to detect and exclude patients with cognitive impairment among the elderly Indian population. MMSE cannot reliably differentiate cognitive deficits which are a part of depression from those due to dementia. In the study, a quarter of the sample belonged to either old–old (70–79 years) or the oldest–old subgroups (80 years and above), 22% and 4%, respectively, and an almost similar proportion (23%) had no formal education and was classified as illiterate. The cut-off score of 25 in MMSE may be too high for these elderly subjects who are illiterate or have a lower level of education. A recent study using receiver operating characteristic (ROC) curve analysis to find out a reliable cut-off score of MMSE to detect dementia found that cut-off scores should be different according to the level of education as follows: 22 for the low education group (sensitivity = 87%, specificity = 82%), 23 for the middle education group (sensitivity =

86%, specificity = 87%), and 24 for the high education group (sensitivity = 81%, specificity = 87%).[2] It was also suggested that if one wishes to apply a single cut-off irrespective of the level of education, the score of 23 is suitable for the whole sample. Therefore, many patients scoring between 23 and 25 may not have dementia and their performance in MMSE could be a reflection of aging and their low education level. It is possible that a study sample not including such elderly patients may not truly represent the elderly population with MDD.

An Indian study specifically comparing MMSE and Hindi Mental State Examination (HMSE) in urban Indian elderly found that illiterate elderly subjects scored lower in MMSE compared to HMSE.[3] HMSE, a Hindi adaptation of the MMSE, was developed specifically to address the limitation of MMSE for illiterate elderly Indian population, with high sensitivity (94%) and specificity (98%) at the cut-off score ≤23 and therefore is a better tool as evidenced by various studies done in Indian elderly population.[3-5]

While considering the possibility of abuse, presence of cognitive deficits in an elderly patient is important because an elderly population with cognitive deficits requires more assistance from their caregivers. Cognitive deficits also contribute to the behavior problems commonly seen in elderly patients. Both the factors (increased need for care and behavior problems due to cognitive impairment) increase the burden of the caregivers and thus increase the possibility of all types of abuse.[6,7] Therefore, excluding such population who are at a higher risk may not give an idea about the problem seen in the society where a depressed elderly patient may have various kinds of cognitive problems due to various reasons (as a part of depression, age-related, and due to dementia).

The researchers have made a sincere effort in exploring the relatively unaddressed issue of abuse in the elderly population in India. We expect similar studies by the team in the future, covering a broader group of the elderly population in terms of both the place of selection (including patients from the community) and also other types of disorders.

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"I Stopped Hearing Voices, Started to Stutter" – A Case of Clozapine-Induced Stuttering

Dear Editor,

Clozapine is one of the most efficacious treatments in resistant schizophrenia. With action on multiple neurotransmitter systems, clozapine is attributed with multiple common (e.g., sedation, hypersalivation, tachycardia, constipation, weight gain, and seizures) and rare but serious (e.g., agranulocytosis and myocarditis) adverse effects limiting its clinical usage. There are reports of other rarer side-effects such as gastroesophageal reflux disease, priapism, intertriginous erythema, pulmonary thromboembolism, pseudo-pheochromocytoma, and parotitis.[1] Stuttering is one such unusual adverse effect of clozapine.[2] In this case report, we describe a rare adverse effect of stuttering related to clozapine.

CASE REPORT

A 29-year-old engineering graduate presented with auditory hallucinations, negative symptoms, and cognitive deficits for 2 years. Diagnosed with schizophrenia, he failed adequate trials (nearly 4 months each) of risperidone (6 mg/day), aripiprazole (20 mg/day), and amisulpride (800 mg/day) with fair medication adherence. Clozapine was initiated after 4 years of onset of illness and gradually titrated up to 125 mg/day over 1 month. He showed significant improvement, with remission of auditory hallucinations within a few weeks of clozapine monotherapy.

The patient developed stuttering after a few days of optimizing clozapine dose, without any other major clozapine-related adverse events. He and his family members noticed dysfluency in his speech, characterized by frequent repetitions of words that included broken words. However, they ignored it as he was relieved of hallucinations. Over the next 3 years of initiation of clozapine, stuttering became a major concern as the patient procured a job as a lecturer in an engineering college.

A detailed clinical evaluation for any childhood onset developmental disorder, anxiety disorder, sensory deficits such as hearing problems, or focal neurological deficits did not reveal any etiological factor for the speech impairment. Electroencephalogram (EEG) failed to show any significant abnormality.

Clozapine dose was reduced to 100 mg, and on follow-up at first and third-month, significant improvement in his speech fluency was noted, without any deterioration in clinical status. Hence, re-escalation of dose was not attempted. Naranjo adverse drug reaction scale showed a score of six, suggesting stuttering as a probable adverse effect of clozapine.[3]

DISCUSSION

Stuttering is the frequent repetition or prolongation of sounds or syllables or words, or frequent hesitations or pauses that disrupt the rhythmic flow of speech. Stuttering might interfere in academic and occupational functioning and impact on social functioning secondary to self-image disturbances.[4]

Stuttering is generally developmental, but secondary etiologies because of the neurological and psychological insults have also been described. Developmental stuttering is usually seen in children, whereas secondary causes may be seen in any age group.[5] There is literature on iatrogenic causation with antidepressants and antipsychotics such as risperidone and aripiprazole.[6] Although rarely, clozapine has also been reported to cause stuttering. A retrospective study in Ireland estimated the prevalence of stuttering as 0.92% (6 of 654) in patients treated with clozapine.[7]

The mechanism of stuttering is complex and poorly understood. Studies have shown psychological stressors, genetic links with familial inheritance, and lingual and laryngeal muscle pathologies to underlie stuttering. However, the evidence largely suggests a lack of integration of somatosensory, language, and motor regions involving fronto-temporo-parietal networks and subcortical structures.[5]

The exact mechanism of antipsychotic-induced stuttering is uncertain. It has been related to the duration of antipsychotic treatment and extrapyramidal side effects including dopaminergic supersensitive states such as tardive dyskinesia and dystonia.[6] Clozapine, with its lower dopaminergic affinity, is less likely to be involved in extrapyramidal side effects-related pathogenesis. Apart from dopamine, multiple neurotransmitter systems, including muscarinic and α-adrenergic receptors, where clozapine exerts its influence have also been implicated.[8]

A few studies on clozapine-induced stuttering suggest an association between the stuttering and a

seizure-like activity in EEG and improvement with antiepileptics.[9] However, our patient did not have any seizures clinically or electrophysiologically, which was also the case with many other cases reported earlier.[2] Hence, the exact mechanism needs further systematic evaluation.

This adverse effect also appears to be dose-dependent, and a modest reduction in dose could be the only strategy needed to manage the stuttering.[10] A similar phenomenon was observed in our case, where stuttering was induced at a relatively low dose of clozapine, and reduction of dose led to improvement in stuttering without symptom relapse. We did not do the serum clozapine levels because of lack of facility, which remains a limitation of this report.

It is necessary for clinicians to identify rare but consequential side effects such as stuttering due to clozapine, which could be readily missed/misattributed if not for a comprehensive evaluation. Recognizing and treating such side effects with simple measures like reducing the dose would help in the occupational and social recovery of the patients.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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Multiple Testing and Protection Against a Type 1 (False Positive) Error Using the Bonferroni and Hochberg Corrections

Chittaranjan Andrade

ABSTRACT

In a given study, if many related outcomes are tested for statistical significance, one or more outcomes may emerge significant at the $P < 0.05$ level not because they are truly significant in the population but because of chance. The larger the number of statistical tests performed, the greater the risk that some of the significant findings are significant because of chance. There are many ways to protect against such false positive or Type 1 errors. The simplest way is to set a more stringent threshold for statistical significance than $P < 0.05$. This can be done using either the Bonferroni or the Hochberg correction. Using the Bonferroni correction, 0.05 is divided by the number of statistical tests being performed and the result is set as the critical *P* value for statistical significance. Using the Hochberg correction, the *P* values obtained from the different statistical tests are arranged in descending order of magnitude, and each *P* value is assessed for significance against progressively more stringent levels for significance. The Bonferroni and Hochberg procedures are explained with the help of examples.

Key words: *Bonferroni correction, false positive error, Hochberg correction, multiple testing, P value, type 1 error*

Imagine that you conduct a 3-month trial in which patients randomized to receive risperidone or haloperidol are examined to determine which antipsychotic is associated with better outcomes for negative symptoms and cognitive functioning. In this trial, negative symptoms are assessed using the Positive and Negative Syndrome Scale-Negative Syndrome subscale (PANSS-N) and the Scale for Assessment of Negative Symptoms (SANS); the total score on each scale is the outcome of interest. Cognitive functioning is assessed using tests of attention and concentration, visual memory, verbal memory, working memory, and ideational fluency; each test yields a single score. Thus, there are two negative symptom outcomes and five cognitive outcomes, making a total of seven outcomes to be compared between groups.

You know that if you compare just one outcome between the two groups, and if the two groups actually (in the population) do not differ on this outcome, there is only a

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5% probability that the result will be statistically significant because of chance; this is what $P < 0.05$ means.[1] You also know that the larger the number of outcomes compared between the two groups, the greater the likelihood that one or more outcomes will be significant by chance alone. In fact, if five related outcomes are tested, there is a 23% probability that one of the outcomes will be significant by chance.[1] This is known as a false positive error or a Type 1 statistical error.[1] So how would you protect against an inflated Type 1 error when you compare the risperidone and haloperidol groups?

Although negative symptom burden and cognitive impairment are correlated, because they represent different conceptual entities it would be reasonable to protect against a Type 1 error separately for the two negative symptom outcomes and for the five cognitive outcomes. Protection against a Type 1 error can be done in many ways. One method sets a more stringent value of *P* for statistical significance. This can be done using the Bonferroni correction or the Hochberg correction.[2]

THE BONFERRONI CORRECTION

With this method, the value of *P* for statistical significance (conventionally, 0.05) is divided by the number of statistical tests performed. So, for the negative symptom outcomes, because there are two tests (one for PANSS-N and one for SANS), *P* for statistical significance is set at 0.05/2 or 0.025. This means that the outcomes for PANSS-N and SANS will be considered significant only if the *P* values associated with these tests are <0.025 instead of <0.05, as conventional. With regard to the cognitive outcomes, because there are five tests, for any of the five outcomes to be considered statistically significant, it should result in a *P* value that is <0.05/5; that is, <0.01.

The Bonferroni correction is considered *conservative*; that is, it makes it quite difficult to obtain statistically significant results. This is because when the number of tests performed is large, the *P* value required for statistical significance becomes quite small and is hard to achieve. In other words, the Bonferroni correction magnifies the risk of a false negative or Type 2 statistical error.[1] The Hochberg sequential procedure offers a better balance between the Type 1 and Type 2 error risks.

THE HOCHBERG SEQUENTIAL PROCEDURE

With this method, after the groups are compared on each of the five cognitive outcomes, the *P* values obtained are arranged in descending order of magnitude. If the outcome with the largest *P* value is significant at the 0.05 level (i.e., $P < 0.05$), then all the outcomes are considered significant. If the first *P* value is >0.05, then the second *P* value is examined; if the second *P* value is <0.05/2 (that is, 0.025), then this outcome and all the outcomes with smaller *P* values are considered significant. If the second *P* value is >0.025, then the third *P* value is examined; if the third *P* value is <0.05/3 (that is, 0.017), then this outcome and all the outcomes with smaller *P* values are considered significant; and so on.

For the negative symptom outcomes, if the larger of the two *P* values is <0.05, then both outcomes are considered significant. If the larger value is >0.05, the second *P* value will be considered significant only if it is <0.05/2; that is, 0.025.

Effectively, the Hochberg sequential procedure applies progressively more stringent criteria for statistical significance, and the last *P* value is examined at the Bonferroni correction level if the previous *P* values were not significant on Hochberg testing.

NOTES

1. Corrections for a Type 1 statistical error are necessary only when many tests of the same construct (e.g., cognition) are conducted. Correction is generally considered unnecessary if different tests examine different constructs (e.g., psychosis, memory, and extrapyramidal symptoms). However, in such a context, the issue of primary outcome vs secondary outcomes must be considered[3]
2. Avoidance of a Type 1 error is desirable in confirmatory studies but may be dispensed with in exploratory studies where authors do not wish to miss a potentially significant outcome
3. Sometimes, authors may set an arbitrarily conservative *P* value (e.g., $P < 0.01$) for all tests to modestly protect against a Type 1 error.[4]

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There are no conflicts of interest.

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Erratum: Comments on "Specific Learning Disabilities: Issues that Remain Unanswered"

In the article titled "Comments on "Specific Learning Disabilities: Issues that Remain Unanswered"", published on pages 590-591, Issue 6, Volume 40 of Indian Journal of Psychological Medicine,[1] the name of the second author is written incorrectly as "Harish MT" instead of "Harish M Tharayil".

The "How to cite this article" section should read correctly as "Vidyadharan V, Tharayil HM. Comments on "Specific learning disabilities: Issues that remain unanswered". Indian J Psychol Med 2018;40:590-1".

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