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Letter-to-Editor

Prevalence of alcohol & tobacco use & mental health correlation among male coal miners in West Bengal

Sir,

The article by Chakrabarti *et al*[1], on the prevalence of alcohol use disorder and psychiatric comorbidity among coal mine workers, published in a recent issue of the Indian Journal of Medical Research, addresses a crucial public health issue. It highlights the high prevalence of alcohol and tobacco use and associated mental health correlates among male coal miners in West Bengal, India. However, several limitations were observed in the article which may influence the interpretation and generalisability of its results. Dealing with such limitations could make it easier for us to understand the situation more profoundly and allow for the development of better interventions in the discussed context.

An important concern regarding this study is a critical sampling bias that could have originated from the recruitment process. The systematic household-based sampling method included every third or fifth household, as per the workers' availability. This approach may have induced selection bias. Mine workers who were at home during the survey may have systematically been different from those who were away, possibly due to shift work, overtime, or absenteeism tied to substance use or mental health issues[2]. Furthermore, only two mines were selected for this research based on accessibility and convenience. Therefore, the sample of the coal mining population was limited, raising concerns about its representativeness for the entire region[3]. Another limitation is that the study only focused on male workers in the mining industry and did not include female workers. This mirrored the characteristic that mainly males dominate the workforce for mining activities. However, this excluded substance use and mental health problems among women employees who could be responsible for administrative, supervisory, or support work within the mining sector. Apart from the high risk of substance use and mental health disorders, women also have significant risks of work-related disorders in stress-stricken jobs and experiences that may be entirely different from those of their male counterparts[4,5].

Dependency on self-reported data as a basis for determining both substance use and mental health conditions is another concern regarding the study. Self-reporting tends to under-report or over-report because of social desirability bias or fears of being stigmatised or loss of confidentiality, more so when sensitive issues such as drug use come into the picture[6]. The absence of biological verification methods, such as urine or blood tests, limits the accuracy of the estimates reported. It has been reported that differences exist between self-reported substance use and biological measures, emphasising the need for objective assessments to validate self-reported data[7].

In itself, a cross-sectional study design brings some inherent pitfalls in determining causality between substance use and the mental health correlates. Since this study has come up with substantial associations between combined alcohol and tobacco use with increased risks of anxiety and depression, it could not differentiate between the causality that substance use affects the mental health status and pre-existing mental health problems lead to an increase in substance use – a factor known as reverse causality[8]. The existence of temporal relationships and causality can only be confirmed through longitudinal studies, further revealing the ways substance use interplays with mental health among coal miners[9].

Moreover, the mental health evaluation was limited to anxiety and depression using the Hospital Anxiety and Depression Scale (HADS). Among psychiatric conditions recognised to be prevalent in stressful occupations, such as post-traumatic stress disorder, sleep disorders, and substance-induced psychosis, were not included in the study[10]. A more comprehensive mental health questionnaire would give a clearer view of the workers' mental condition and may thus reveal additional areas for intervention.

Another important limitation is that the workplace environmental factors were excluded. The study did not assess any specific occupational stressors, such as job demands, work hours, shift patterns, exposure to hazardous conditions, or safety practices – all of which may relate to substance use and mental health problems[11,12]. All these factors play a crucial role in developing interventions focused on individual behaviours in the workplace and the use of substances along with mental health conditions related to those settings.

The employees of the Eastern Coalfields Limited (ECL), involved in the process, might had an influence on the readiness of respondents to disclose issues about sensitive matters. The authorities might not be sure about the confidentiality of the survey and could have underreported substance use and symptoms of mental health fearing adverse consequences[13]. Independent data collection and confidentiality emphasis are important in such studies for obtaining accurate and reliable data. Nevertheless, the lack of a control group or comparative data makes it difficult to ascribe the high prevalence of substance use and mental health issues solely to coal mining. A control group comprising of workers not working in any mining operation or miners from other regions could have made comparative analyses possible so that one could identify whether the issues are industry-specific or an extrapolation of broader trends in society[14]. Such comparisons would be useful when tailoring interventions appropriately. In addition, the study did not account for other variables like health conditions, socio-economic factors aside from income status, family history of substance use, and support systems. Such variables influence not only substance use but also the outcomes in mental health, and failure to account for them may negatively affect the study's validity[15].

Other critical ethical concerns involve matters of informed consent and confidentiality. Presenting topics such as drug abuse and mental illness to a place that may jeopardise one's job security could be a problem for the individuals' willingness to participate[16]. Participation might have been coerced, and the truth never revealed. Indeed, such studies should, for example, respect informed consent as being as non-coercive as possible and maintain confidentiality in each detail to protect the rights and well-being of the participants. The spatial and temporal scope of the study has further restricted the generality of the results. Being held only in two mines within the Asansol-Raniganj area, the results may not represent other mining regions with other environmental, cultural, or occupational conditions[17]. In addition, data collection took more than two years; thus, during this period, external factors like economic change, policy shift, or social events might have played a role in altering substance use patterns and mental health and could not have been controlled by the present analysis[18].

The relevance, and therefore validity, of the assessment tools themselves is also relevant. Even though the Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) and HADS are validated tools, their appropriateness and usability in the specific cultural context of Indian coal miners could be perceived as different. These cultural attitudes toward substance use and mental health might differ in how questions are understood and answered, thereby impacting the accuracy of these assessments[19]. The adaptation and validation of the tools for the target population to be studied would strengthen the reliability of the findings. Lastly, while screening for high-risk substance use and mental health disorders, participants were not offered on-the-spot support, referrals, or interventions. This has ethical implications for those who take the responsibility of providing support to those interviewed[20]. These limitations provide future research scope into coal miners' substance use, mental health, and occupational factors to a great extent. Expanding knowledge in these areas is important for effective policy development and interventions targeted at improving the health and well-being of such vulnerable populations.

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Authors' response

Sir,

Thank you for your interest in our article[1] published in the July 2024 issue of the Indian Journal of Medical Research. We appreciate your thoughtful comments regarding the importance as well as suggested limitations in relation to this paper.

The systematic household-based sampling method was randomized to exclude errors of sampling. Although, limitations, as indicated in the Letter to Editor[2], could be present, the investigators tried to be statistically precise to avoid such recruitment bias. Similarly, we would have liked to expand our sample size by including more sampling areas. However, keeping the statistical assumptions intact, recruitment was done only from two mining sites, which are representative of the whole population. The focus of the study was exclusively on workers engaged in mining, not on administrative and support staff who do not need to carry out mining work. Therefore, we had to exclude women and other staff as they were not engaged in mining. However, we appreciate the comment that problem areas regarding other mining staff need to be investigated.