

Short Note

Not peer-reviewed version

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Posted Date: 29 June 2024

doi: 10.20944/preprints202406.2053.v1

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Short Note

A Positive Association between Mental Disorders Prevalence and Environmental Quality

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Abstracts: Mental Disorders are an important public health problem. The main of this study was to analyze the prevalence of Mental Disorders and Environmental Quality. Data on the Prevalence of Mental Disorders, Gross Domestic Product, and Median Years of Schooling from 178 countries were used. A positive association was observed and was independent of Gross Domestic Product and Median Years of Schooling.

Keywords: mental disorders; environmental quality; epi score; hygiene hypothesis

Introduction

Mental Disorders (MD) are an important public health problem around the world[1]. Until now, there is no specific cause for the development of these diseases, this suggests that an environmental factor could be involved.

The rise in environmental degradation has been one of the most significant changes observed globally in recent years. Air pollution, in particular, has been linked to higher mortality rates and deteriorating mental health. However, air quality is only one aspect of the environment; therefore, a more comprehensive assessment should consider an indicator that reflects the overall quality of the environment.

The Environmental Performance Index (EPI score) ranks countries on their performance on environmental issues. It is a composite index formed by two areas: environmental health, which measures threats to human health, and ecosystem vitality, which measures natural resources and ecosystem services. The scale ranges from 0 (worst) to 100 (best). More details about it are found on the web page.

Methods

For this study, data to country level were used. The prevalence of MD per 100000 inhabitants was obtained from the GBD database[2] and the EPI score from its official web[3]. Since good health is associated with socioeconomic status and education level, two variables were used to adjust the EPI score, the Gross Domestic Product (GDP) as the socioeconomic status, and the Median Years of Schooling (MYS) as the education level. These data were obtained from the databases of the United Nations[4]. All data correspond to the 2020 year. Pearson correlation, univariate, and multivariate linear regression were performed to evaluate the association. The NCSS12 statistical package was used for the analysis.

Results

Data of 178 countries were used for the analysis, the worldwide prevalence of MD was 13697.2/100000 (IC95%= 13316.1-14078.4), GDP= 18805.3 USD (IC95%= 16017.3-21593), the MYS= 9.0 (IC95%= 8.6-9.5) and the EPI score= 46.5 (IC95%= 44.2-48.8). All variables showed a significant positive Pearson's correlation with the prevalence of MD, its values were as follows, EPI score= 0.58, GDP= 0.50, and MYS= 0.43 (p<0.01).

In both models, the EPI score was associated with the prevalence of MD, the difference between non-adjusted and adjusted models was 3%. On the other hand, education and the economy were associated with the prevalence of MD only in the univariate regression (Table 1).

Table 1. Association of Mental Disorders and EPI score.

Variable	Univariate			Multivariate		
	B ₀	β	R ²	B ₀	β	R ²
				9609.2		0.34*
EPI	9191.6	97.0*	0.34*		94.4*	
GDP	12418.9	0.07*	0.25*		0.01	
MYS	10541.0	394.3*	0.19*		-58.4	

* P<0.01.

Discussion

One possible explanation for the association between MD and EPI score is that children in high-quality environments might be raised in excessively clean conditions. This could reduce their exposure to beneficial bacteria that aid in developing the immune system (microbiota displacement). It is important to remember that the immune system and the brain are interconnected, and improper immune system development is linked to poor brain maturation[5]. This latter can make children more susceptible to the development of mental disorders due to external stimuli such as life stressors, and air pollution later in life.

The hygiene hypothesis has proposed an association between an excessively clean environment and diseases, however, the lack of microbiota exposure during childhood may be the real problem not the absolute clean (displacement microbiota hypothesis).

If more studies confirm this association, a certain level of exposure to microbiota in infants will likely be needed for proper maturation of the immune system and another level for brain development. This finding underscores the importance of vaccination in children and the rational use of antibiotics, especially in developing countries.

Another possible explanation is that EPI scores do not reflect the reality of environmental quality and should be reviewed. There are several critics toward this index however until now there is no perfect index for environmental quality.

In conclusion, worldwide the prevalence of MD is associated with a high score of environmental quality expressed as EPI score.

Conflicts of Interest: None.

Data sharing: The data that support the findings of this study are available on request from the corresponding author.

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