

Introduction

Prevalence of Mental Disorders in India:

- Lower-middle income countries (LMICs) like India are disproportionately affected by mental disorders and are home to > 80% of the world's population with mental disorders (World Health Organization [WHO], 2008).
- In India, 197.3 million (Mn) people suffer from mental illnesses. Depressive and substance use disorders are the most prevalent (Sagar et al., 2020), with depression being a major contributor to disability, morbidity, mortality and significant economic loss (WHO, 2017).
- Although up to 70% of the socio-economic burden can be attributed to depression, only 1 in 10 individuals with depression get any kind of treatment (Gururaj et al., 2016).

Barriers to Mental Healthcare Treatment Access in India:

- Despite the high need for mental health services, 85% or more individuals with common mental illnesses like depression and substance use disorders do not receive any treatment (Gururaj et al., 2016).
- There is a significant shortage of mental health professionals with 0.3 psychiatrists, 0.07 psychologists and 0.07 social workers per 100,000 population (WHO, 2014).
- Lack of culturally congruent interventions and use of "Western" models of psychotherapy pose a challenge to the acceptability of psychotherapy (Bhargava, Kumar, & Gupta, 2017; Varma & Gupta, 2008).
- Language barriers are a major concern since there are 1369 mother tongues and 121 languages (Office of the Registrar General, 2011)

Internet-based Mental Health Interventions in India: A Potential Solution?

- Increasing Internet penetration and ease of access presents an unexplored opportunity for increasing the reach of mental health awareness campaigns and treatment, thus reducing the treatment gap.
- Mobile and internet penetration is rapidly increasing. From 2005 to 2017, the mobile cellular subscriptions in India increased from 90 Mn to 1,169 Mn and internet users increased from 6 Mn to 422 Mn (Ministry of Communications, 2018). In December 2017, there were 670 Mn urban and 490 Mn rural Internet users (Telecom Regulatory Authority of India, 2018).
- Advantages of using Internet to increase mental health service access include increased sense of privacy and anonymity, cost effectiveness (Andersson & Titov, 2014), reduction in geographic barriers particularly for women (Farooqi, 2006), and better management of personnel time (Aggarwal, 2012).
- The effectiveness of internet and mobile based interventions is gaining recognition in India (Kumar & Mehrotra, 2017; Yellowlees & Chan, 2015; Aggarwal, 2012). Research demonstrates preliminary support for internet and mobile based interventions for depression (Mehrotra et al., 2018) and anxiety disorders (Kanuri et al., 2015) in India.

Current Study

The current study aimed to understand the Indian population's interest in Internet-based interventions. We conducted an analysis of the number of visitors to mood management and smoking cessation websites from 233 countries and territories. The data was collected between September 2003 and August 2018. Current versions of the websites can be found at Silicon Valley's Digital Apothecary:

<https://i4health.paloaltou.edu/digitalapothecary.html>

Method

Description of Websites:

The websites consisted of online fully automated Internet interventions studies conducting randomized controlled and participant preference trials. We now refer to them as "Massive Open Online Interventions" that are freely available to anyone in the world (See: Muñoz et al., 2016) and are available in "Digital Apothecaries" (See Muñoz et al., 2018).

Procedure:

We organized the number of visitors to the two intervention websites according to countries and cities. In total, we analyzed the number of visitors from 233 countries and territories.

Data Analysis:

We used descriptive statistics including frequencies and percentage of visitors to identify the 15 countries and cities with the highest number of visitors. We plotted the number of visitors across the 233 countries and territories on a world map to highlight the variations in the frequencies of visitors. We also plotted the number of visitors from India on an individual country map to highlight any patterns of visitors within the country.

Results

Figure 1

Top 20 Countries with Highest Number of Visitors to Mood Management and Smoking Cessation Websites Across 233 countries and territories

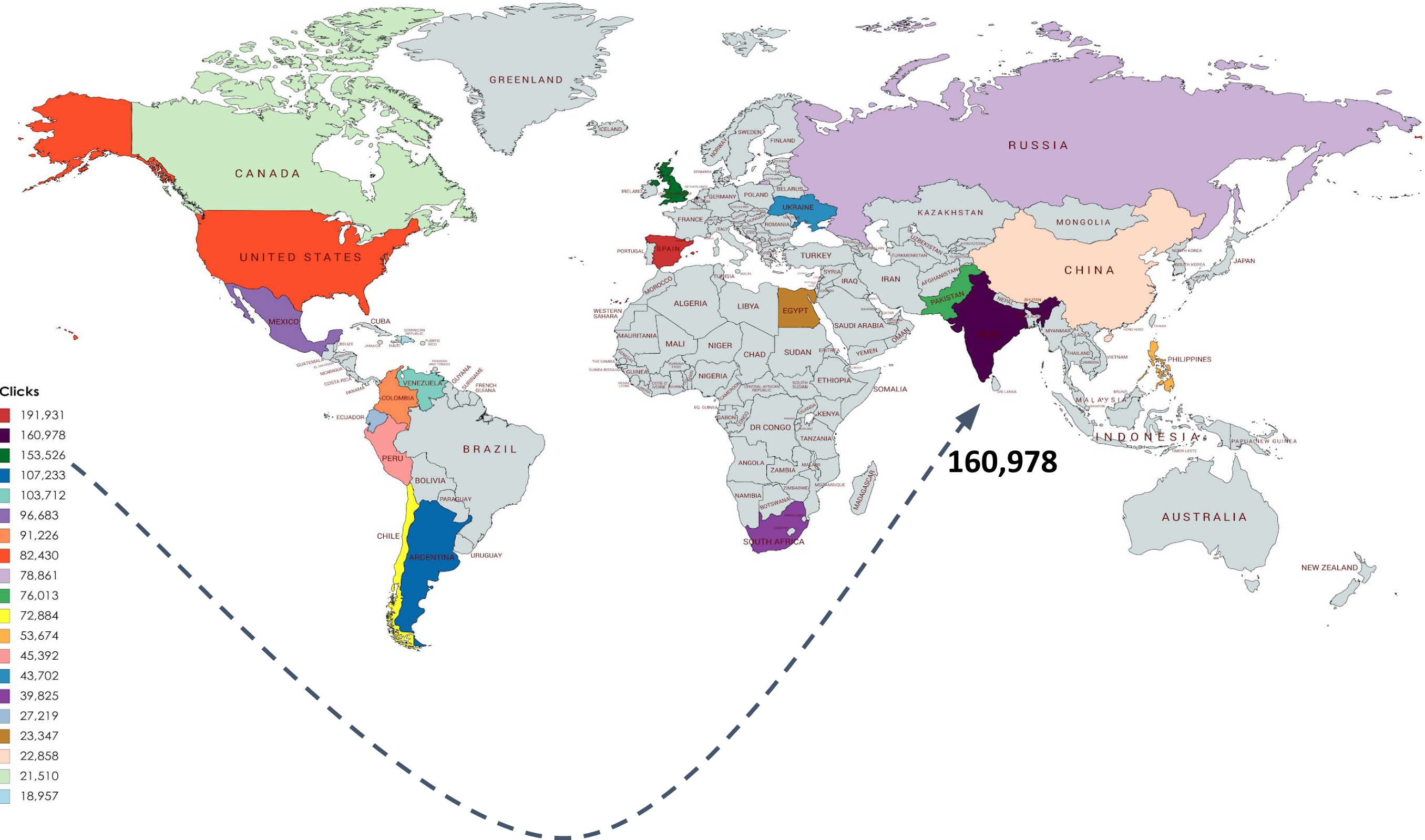


Figure 2

Cities with Highest Number of Visitors to Mood Management and Smoking Cessation Websites

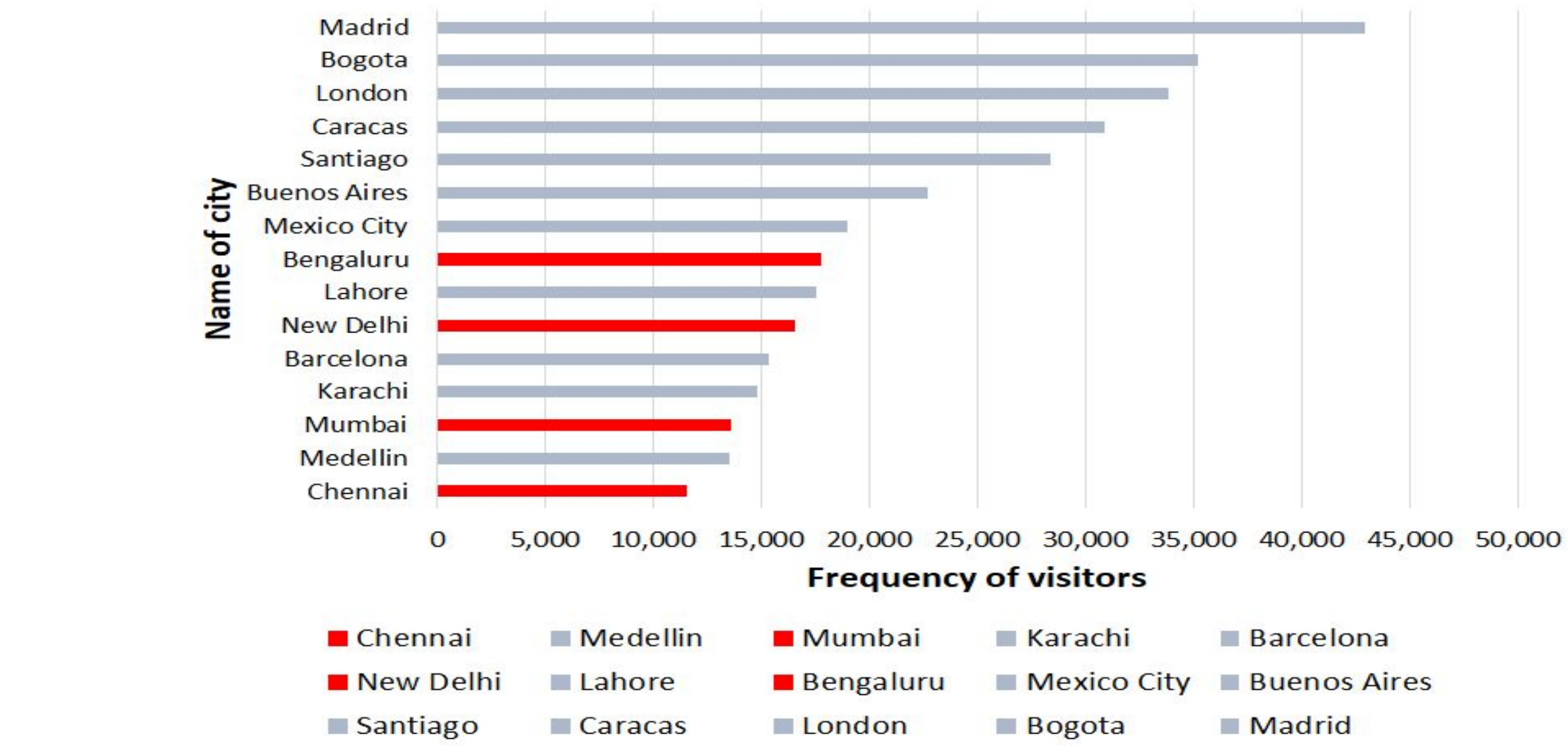


Figure 3

Location of Visitors to Mood Management and Smoking Cessation Websites Across India



The highest number of visitors in India were recorded from the following cities:

World Rank*	Name of Indian City	No of visitors
8th	Bengaluru	17,782
10th	New Delhi	16,556
13th	Mumbai	13,597
15th	Chennai	11,560

Note. *Based on the total number of visitors to mood management and smoking cessation websites.

Discussion

- The findings serve as preliminary evidence of the interest of Indians in Internet-based interventions with 160,978 clicks (approximately 10.6%) from India out of a total clicks of 1,511,961 from the top 20 countries across the world.
- At the country level, India had 2nd highest number of English speaking visitors to the mood management and smoking cessation websites.
- Four Indian cities are featured in the top 15 cities with highest number of visitors across 233 countries and territories.
- Although there is clear interest in Internet-based interventions from non-western/non-English speaking countries (particularly India), majority of the existing internet interventions originate from western and high-income countries (e.g. U.S., U.K.), and are designed from a western cultural lens.

Limitations

- The current study is based on data from only two Internet-based intervention websites; thus, the findings may be an underestimation of the interest of Indians in internet interventions.
- The two websites offered interventions in English, were not designed for the Indian population, and their recruitment strategy also did not focus specifically on India. Consequently, the number of visitors may represent only a subset of the Indian population (i.e., English speaking and high socioeconomic status).

Implications and Future Research

- While the current findings are indicative of the interest in Internet-based interventions in India, 90% of Indians do not report English as their first language (Office of the Registrar General, 2011). Hence, it is important to provide interventions in Indian languages to increase mental health service access.
- Culturally-adapted interventions offered in local languages have the potential to reach a larger segment of the Indian population.
- For a better estimate of the extent of interest in Internet-based interventions in India, future studies can focus on visitor data from culturally-adapted Internet interventions that offer services in Indian languages.

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