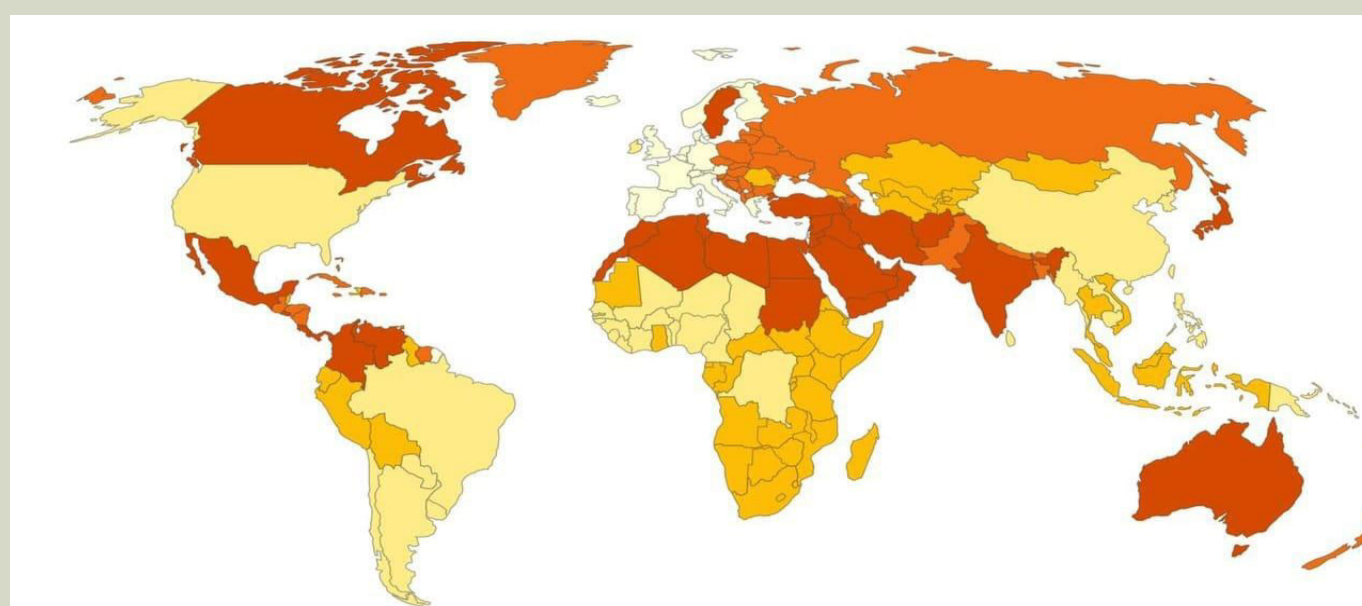# Department of Community Medicine and Epidemiology, KEMU

The Prevalence of Autism in Children in Asia: A Systematic Review

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ABSTRACT

Background:
Autism spectrum disorders (ASD) constitutes a diverse group of conditions related to development of the brain. It is uncertain how prevalent ASD is in various Asian nations. The goal of our study is to evaluate the breadth of the problem as well as the lack of understanding regarding ASD in Asia.

Methods:
We looked for, gathered, and assessed literature that reported the prevalence of ASD in eight Asian nations between 2019 and September 2022. The search was carried out in accordance with PRISMA standards.

Results:
We identified nine articles from Oman, Qatar, India, Israel, Saudi Arabia, Japan, China and Korea which met our predefined inclusion criteria. The reported prevalence of ASD in Asia ranged from 0.29% in China to 1.14% in Qatar to 3.22% in Japan. Prevalence varied substantially across different geographic areas in Israel. The prevalence of ASD in two cities of Saudi Arabia was 2.81 per 1,000 children while, in India 2.25 per thousand and 20.35 per 10,000 children in Oman. In Korea, prevalence was found to be 5.2 per 1,000 births and 9.4 per 1,000 births in 2002 and 2012 respectively. Study sample sizes ranged from 1023 in Saudi Arabia to 1,786,194 in Israel. The targeted age range was 2 and 12 years. No studies were found which reported the prevalence of ASD in other Asian countries. Due to methodological heterogeneity, the review was descriptive, and the data retrieved from the selected studies was summarized but not statistically merged, in accordance with PRISMA.

Conclusions:
This research will contribute to the evidence foundation that will be utilized to plan future research and make policy decisions in this region. Knowing the prevalence of ASD in Asia is essential for allocating resources and services appropriately.

Keywords:
Autism spectrum disorders, Autism, Asia, Prevalence, Oman, Qatar, India, Israel, Saudi Arabia, Japan, China, Korea

INTRODUCTION

Autism remains a fascinating illness, with the concept and description of the disorder changing dramatically over time (1). Autism is a disorder that affects the developing brain and is characterized by a complex, behaviorally defined static malfunction. We refer to autism (the autistic spectrum disorders [ASDs]) as a broad range of developmental disorders marked by deficits in three behavioral domains: 1) social interaction; 2) language, communication, and imaginative play; and 3) a wide range of interests and activities (2). During the last decade, there has been a dubious increase in the prevalence of autism spectrum disorder (ASD) diagnoses around the world. In Asia, the overall prevalence of ASD is 0.36 percent and it is still rising (3). East Asia has a greater prevalence of ASD (0.51 percent) than West Asia (0.35 percent) or South Asia (0.31 percent)(3). The prevalence, specific targets and time bound comparison of incidence of ASD in many Asian countries are still unknown. The aim of the study is to highlight current prevalence of Autism in Asia, the populations at risk and the factors contributing to the incidence. We looked for, gathered, and analyzed literature about the prevalence of ASD in Asian nations published between 2019 and 2022. The search was carried out in accordance with PRISMA rules.

In China, the ASD prevalence rate for general population was 0.29 percent (4). Boys had a greater prevalence than girls (4). The bulk of the 363 confirmed ASD patients (90.4 percent) were newly diagnosed, with 43.3 percent attending traditional schools (4). In India, a study from the rural setting revealed a prevalence of 0.11 percent in children aged 1–18 years, while four studies from the urban setting revealed a prevalence of 0.09 percent in children aged 0–15 years(5). The frequency of ASD was estimated to be 1.07 percent in Sri Lanka (6). In Dhaka city, an alarmingly high frequency (3%) was recorded (6). The ages of the participants ranged from 1 to 30 years old (6). In Pakistan, there have been a number of studies on autism. Sarwar et al., 2009 showed an incidence of 4.5% with a male female ratio of 2:1 in Karachi (7). Another hospital-based study by Imran et al., 2012 showed an incidence of 3.2% with a male female ratio of 2:1 in Lahore (7).

There were no significant studies found in all 48 countries of Asia that documented the prevalence of ASD. Autism rates are skyrocketing as a result of increased awareness and screening, improved access to healthcare, and expanded diagnostic criteria.

Our research aims to determine the scope of the problem and the scarcity of knowledge about ASD in Asia. This study will add to the evidence database that will be used to design future research and make policy decisions in this region. Knowing the incidence of ASD in Asia is critical for appropriate resource and service allocation.

MATERIALS and METHODS

Search Strategy

The search approach adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist (9) and the PRISMA guidelines were followed throughout. An extensive systematic search of four electronic databases; PubMed, Medline, Hinari and The Cochrane Library was undertaken. Studies done between 2019 and September 2022 were selected.
Combination of the following terms was used for the search:
Category 1: Population (Asia, children)
Category 2: Disease (Autism, Autistic Spectrum Disorder, Autistic Disorder, Asperger Disorder, and Rett's syndrome)
Category 3: Prevalence or Epidemiology
With the search criteria mentioned above, a new search was run for each country in Asia one by one. Additional publications were found by manually searching the reference lists of these researches. The citations found in the search results were downloaded to the Endnote reference management software version X20.0 and duplications were removed. Initially, the articles were reviewed on the basis of title and abstract followed by full article reviews.

Eligibility Criteria

Inclusion Criteria:
Articles were included based on following criteria:
a) Studies focused on children aged 2 to 12 years.
b) Individual studies with original data including gray literature
c) Defined diagnostic criteria stated for autism or autism spectrum disorders
d) Prevalence
e) Studies which were available in English language or could be translated to English language
f) Geographically defined population that is Asian residents
g) Studies done between 2019 and September 2022.

Exclusion Criteria:
a) Studies which weren't extractable
b) Editorials, reviews and commentaries
c) Qualitative studies
d) Studies which weren't of interest.

RESULTS

PRISMA Flow Diagram of Selection of Studies for Inclusion in the Systematic Review

Studies identified through database searching (n = 338)

Duplicate studies removed (n = 201)

Studies assessed for eligibility (n = 137)

Studies excluded after title and abstract screening (n = 128)

Studies selected for full-text screening (n = 09)

Studies excluded after full-text screening (n = 0)

Studies included in systematic review (n = 09)

Characteristics of Selected Studies

Seven community based and two hospital based studies that reported the prevalence of ASD; two studies from China (17,19), one from Oman, Qatar, India, Israel, Saudi Arabia, Korea and Japan each (11-16,18) were selected. Study sample sizes ranged from 1023 in Saudi Arabia to 1,786,194 in Israel.

Quality Appraisal

The included studies were assessed for quality by The Joanna Briggs Institute (JBI) critical appraisal tools for prevalence studies (10). All studies that fulfilled the eligibility criteria were included in the review regardless of their quality assessment results. . Following were the results for the mentioned 9 studies: 6 (66.67%) were of very good quality, 1 (11.11%) was of good quality, 1 (11.11%) was of average quality and 1 (11.11%) was of poor quality.
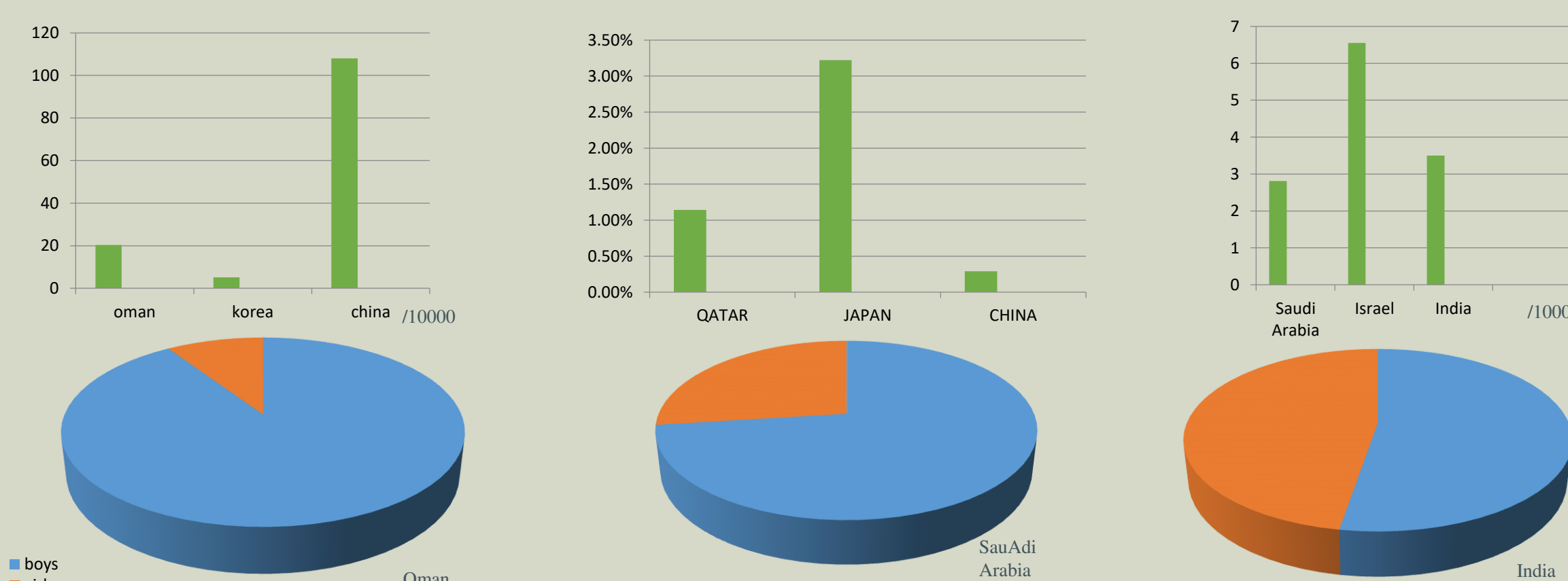
DISCUSSION

During the last decade there has been a dubious increase in the prevalence of autism spectrum disorder (ASD) diagnoses around the world. Most of this work has been done in west. There is a significant lack of information about prevalence of autism in Asia.This systematic review collects all the data on the prevalence of autism spectrum disorder in Asia and includes journals that have matched the outcome results of our topic. A total of 338 articles were found which reported prevalence in different countries of Asia. This included all the articles published between years 2019 -2022. After screening using our inclusion and exclusion criteria according to PRISMA guidelines, 9 articles were finally selected. This included 2 articles from China (17, 19) and one article each from Oman, Qatar, India, Israel, Saudi Arabia, Korea and Japan (11-16,18). In 2019 a study was conducted in Oman of population sample of 1705 individuals ranging from age 0-14 years and highest prevalence was found in Mascat (15).Boys were found to have 3.4-fold higher prevalence of ASD than girls. The prevalence was found to be 15-fold higher since 2011 estimates. It was due to improvement in screening programmes and diagnostic criteria. ASD is not linked to geographical or political boundaries unless it is linked to genetic and environmental factors. In Qatar a population sample of 176,900 people was taken and prevalence was found to be 1.14 % (11).It had two components a school component uniquely due to newly diagnosed cases accounting for 28.1% of overall prevalence. In India cross sectional study was conducted having population size of 8400 individuals and prevalence was found to be 2.25/1000 people with a rate of 52.63% in males and 47.56% in females (12). It was a population-based study having a sufficient sample size and low response rate. Indian scale for assessment of autism was used for assessment of disability in autism. In study from Kolkata scales used were translated from western scales. The study looked at cases below cut off on screening tool to find out false negative results. At last study used PPS method for sample size and stratified random sample technique to have representative sample from rural urban areas. In Israel, cohort study was conducted using DSM-TR criteria and prevalence was 6.55% but it varies among different regions of Israel (16) . High SES localities report higher prevalence than those of their sub district localities. This pattern of higher prevalence in central areas seems to be steady over years. Arab localities were found to have three-fold lower prevalence mixed one have intermediate and Jewish localities have higher prevalence. This may indicate lower awareness or acceptance of mild cases of ASD in Arab population. Health services seem to be centred more in central areas than in peripheral localities. In Saudi Arabia prevalence was found to be 2.81/1000 people in children aged 6-12 years attending schools as rehabilitation centres in Makkah and Jeddah (14). The increased prevalence is associated with some genetic and environmental factors. In Saudi Arabia the rate of cousin marriage is high. In Japan cross sectional study was conducted on group of 3954 individuals with prevalence of 3.22% over age of 4 years. Male and female ratio was found to be 2.2 in total study population (16). 30% of children with ASD have not been identified as developmentally challenged and have not received services and interventions. This study describes high rates of co-occurring NDDs. In China prevalence was found to be 108 /1,00,000 using CAST DSM criteria(17). In Korea prevalence was 5.2/10000 and it was 2.7 times higher in boys than girls (18). In China again a study was conducted using cluster sampling and prevalence was significantly higher in boys than in girls (19). Population sample was of children between age 6-12 years. Estimated prevalence was of 0.70%.

CONCLUSIONS

This has significant effects on the government and NGOs operating in this field. Despite the worrying rise in the prevalence of ASD in recent years, this study found only a small number of research on the condition that were carried out in this region of the world, which limits our ability to draw any firm conclusions. There is an urgent need for all nations in this region to conduct well designed epidemiological research utilising consistent and suitable tools in order to understand the scope of ASD as a public health issue. Knowing the prevalence could help choosing screening and diagnostic tools that are applicable, culturally acceptable, and cost-effective to identify individuals who can benefit the most from early diagnosis and intervention.

REFERENCES

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