

**To Cite:**

Aljabri HM, Laswad BM, Binjabi HZ, Alturki MH, Babukur AO, Laswad AM, Krenshi MO, Shatla MM. Awareness and knowledge of Attention Deficit Hyperactivity Disorder among general population of Makkah, Saudi Arabia. *Medical Science* 2022; 26:ms412e2440.

doi: <https://doi.org/10.54905/diissi/v26i128/ms412e2440>

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**Peer-Review History**

Received: 11 August 2022

Reviewed & Revised: 14/August/2022 to 06/October/2022

Accepted: 12 October 2022

Published: 15 October 2022

**Peer-review Method**

External peer-review was done through double-blind method.

URL: <https://www.discoveryjournals.org/medicalscience>



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# Awareness and knowledge of Attention Deficit Hyperactivity Disorder among general population of Makkah, Saudi Arabia

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**ABSTRACT**

*Background and aim:* Attention Deficit Hyperactivity Disorder ADHD is considered as one of the common neuro developmental disorders. It is common among children and young adults, affecting their social, academic, and occupational functioning. ADHD can be diagnosed using the revised DSM-5 diagnostic criteria. As there is lack of studies that assess the awareness and knowledge of ADHD among the general population of Makkah, our study targets the general population of Makkah to assess their awareness and knowledge regarding ADHD. *Methods:* A descriptive cross sectional study using an electronic survey formed by Google forms. Data were obtained from residents of Makkah city aging 15 years and above. *Results:* A Total of 603 participants have enrolled in this study, 69 of them were excluded for not meeting the criteria. (94.2%) had heard about ADHD and (39.9%) of responders knew about it from social media. 56.6% considered that it's a mixed disorder (behavioral, neurological and psychiatric), whereas 24.2% believed it to be a behavioral disorder only. As for its cause, 80% of the participants believed it is a multi-cause disorder. In regard to the treatment, 75.1% determined that the best modality is combined medical and behavioral therapy, while 19.9% favored behavioral therapy, 2.6% preferred medications and 2.4% believed there is no treatment for ADHD. *Conclusion:* Our study reported the knowledge and awareness level of Makkah population regarding ADHD. Makkah residents would benefit from further education and orientation regarding ADHD.

**Keywords:** ADHD, Attention Deficit Hyperactivity Disorder, awareness Makkah, Saudi Arabia.

## 1. INTRODUCTION

According to the American Psychiatric Association, attention deficit hyperactivity disorder (ADHD) is considered a chronic disorder that affects mainly children and often extends into adult life, affecting their social, academic and occupational functioning, characterized by elements of inattention, hyperactivity, and impulsivity (Harpin, 2005; Ghiasi et al., 2022). There are three major types of ADHD; patients with the combined type, which is the most common, often have problems paying attention and concentrating on activities, and may exhibit hyperactive or impulsive behavior (Biederman et al., 2006). The second type is the inattentive type, in which the patients may have problems paying attention but do not exhibit signs of hyperactivity or impulsivity. Lastly, the hyperactive-impulsive type is the least common type, which has less problems with attention and it is the most prevalent in pre-schoolers where the hyperactive component usually predominates (Franke et al., 2012; Chou et al., 2015; Hadzic et al., 2017; Adeyemo et al., 2014; Donzelli et al., 2019).

The prevalence of ADHD has been previously assessed in several studies around the world. As in the United States of America and Korea, ADHD prevalence was found to be 6% and 8% respectively (Al-Ahmari et al., 2018). Locally, Al-Zaben et al., (2018) has assessed the prevalence of ADHD among primary school students in the western region of Saudi Arabia and found it to be 5%. According to DSM-5 criteria, the presence of 6 or more inattentive symptoms and/or 6 or more impulsive and hyperactivity symptoms in children is required for a modern diagnosis of ADHD. Adults with ADHD have somewhat different requirements: those aged 17 and up only need to demonstrate 5 symptoms to meet the criterion. DSM-5 further stipulates those symptoms must be 2 or more environments, begin prior to age 12, cause notable dysfunction, and not occur primarily in the context of a psychotic illness or be better accounted for by another mental disorder or medical condition (American Psychiatric Association, 2013).

Common Symptoms of ADHD present as attention deficit, including decrease in concentration and difficulty in following instructions. Symptoms of hyperactivity include repetitive movements and inability to sit in one place (American Psychiatric Association, 2013). ADHD patients are more likely to exhibit more antisocial behaviors than children without ADHD and they tend to drop out of school, have fewer friends and in some cases not completing college (Barkley, 2014). When ADHD patients advance to adulthood, they have more difficulty finding work; have higher rates of psychiatric disorders such as personality disorders, depression and substance misuse (Barbarese et al., 2013; Mash & Johnston, 1983). Moreover, the treatment of ADHD consists of a combination of pharmacological and behavioral intervention with consideration of related comorbid disorders (Austerman, 2015).

## 2. MATERIALS AND METHODS

This is a cross-sectional study that included the general population of Makkah, Saudi Arabia as participants in this study. The study population included both genders male and female, Saudi and non-Saudi individuals residing in Makkah city who were above 15 years of age, we excluded participants residing outside Makkah city and those under 15 years of age. An electronic Self-administrated survey formed by google forms, that was distributed in May 2022 via social media platforms after obtaining the ethical approval by the Biomedical ethics committee at Umm Al-Qura University (UQU), College of Medicine, Makkah, Saudi Arabia, Approval No (HAPO-02-K-012-2022-05-1086). The study sample was calculated by OpenEpi website version 3.0 (AG, KM, 2013), in consideration of the following: the residents of Makkah city estimated to be 1.5 million according to the general authority for statics Saudi Arabia, keeping the confidence interval (CI) level at 95% and considering 50% prevalence of the sample size. The sample size was calculated to be 385 participants.

We used a valid assessment tool based on a previously published study (Al-Bluwe et al., 2020). Consent was obtained from all participants; contact info was attached with the survey to answer any inquiries. The survey included three sections, the first section contained demographic data such as: age, gender and educational level. The second section assesses the general knowledge of Makkah population regarding ADHD. The third section consists of the diagnostic symptoms and signs of ADHD based on the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5) criteria which include 15 items.

## 3. RESULTS

A total of 603 participants completed the questionnaire, 69 have been excluded for not meeting the criteria. As (Table 1) shows the participants' socio-demographic characteristics, in which 311 of the sample were female (58.2%) and 223 were male (41.8%). The majority of them (n=143, 26.8%) were between 15-25 years, while (n=105, 19.7%) were between 26-35 years, and (n=133, 24.9%) between 36-45 years and other age groups are shown in table 1. Regarding the educational differences among the participants, most of them (n=355, 66.5%) had a university degree, (n=86, 16.1%) were secondary school graduates, (n=61, 11.4%) were Postgraduates. Meanwhile, minority of the participants (n=19, 3.6%) and (n=13, 2.4%) had middle school education and elementary education, respectively.

**Table 1** participants' socio-demographic characteristics

Variables		N	%
Gender	Male	223	41.8
	Female	311	58.2
Age	15-25	143	26.8
	26-35	105	19.7
	36-45	133	24.9
	46-55	108	20.2
	56-65	37	6.9
	<66	8	1.5
Educational level	Elementary	13	2.4
	Middle school	19	3.6
	Secondary	86	16.1
	University	355	66.5
	Postgraduate	61	11.4

In addition, Table 2 shows participants' knowledge of ADHD. Impressively near all of them (n= 503, 94.2%) have heard about ADHD and could specify from where have they heard about it; (n=213, 39.9%) chose social media, (n=106, 19.9%) by reading a medical website, (n=103, 19.3%) through previous experience with an ADHD patient, (n=54, 10.1%) from books, journals, and newspapers and (n=27, 5.1%) did not know. Moreover, more than half of the participants (n=302, 56.6%) presume the nature of ADHD to be mixed disorder (behavioral, neurological and psychiatric), while (n=129, 24.2%) believed it to be a behavioral disorder, (n=38, 7.1%) considered it as a neurological disorder, (n=32, 6.0%) thought it's a psychiatric disorder and (n=33, 6.2%) did not know. In regard to the cause of ADHD, more than three quarters (n=427, 80%) believed it's a multi-cause disorder, (n=76, 12.5%) considered it to be genetic cause, (n= 17, 3.2%) thought it's due to nutritional habits, (n=21, 3.9%) accused food preservatives and dyes and (n=2, 0.4%) charged smoking as the cause. When the responders were asked about the treatment method, (n=401, 75.1%) preferred medical and behavioral therapy, (n=106, 19.9%) favored behavioral therapy, while the rest of them (n=14, 2.6%) chose medications and (n=13, 2.4%) considered it as an untreatable disorder.

**Table 2** Participants' knowledge of ADHD

	N	%
<b>Have you heard about ADHD?</b>		
Yes	503	94.2
No	31	5.8
<b>If yes, Source of information:</b>		
Previous experience with an ADHD patient known to me	103	19.3
Reading a medical website	106	19.9
Books, journals, and newspapers	54	10.1
Social media	213	39.9
Don't know	27	5.1
<b>Nature of ADHD:</b>		
Behavioral disorder	129	24.2
Neurological disorder	38	7.1
Psychiatric disorder	32	6.0
Mixed disorder (behavioral, neurological and psychiatric)	302	56.6
Don't know	33	6.2
<b>Underlying causes of ADHD:</b>		
Genetic disorder	67	12.5
Nutritional habits	17	3.2

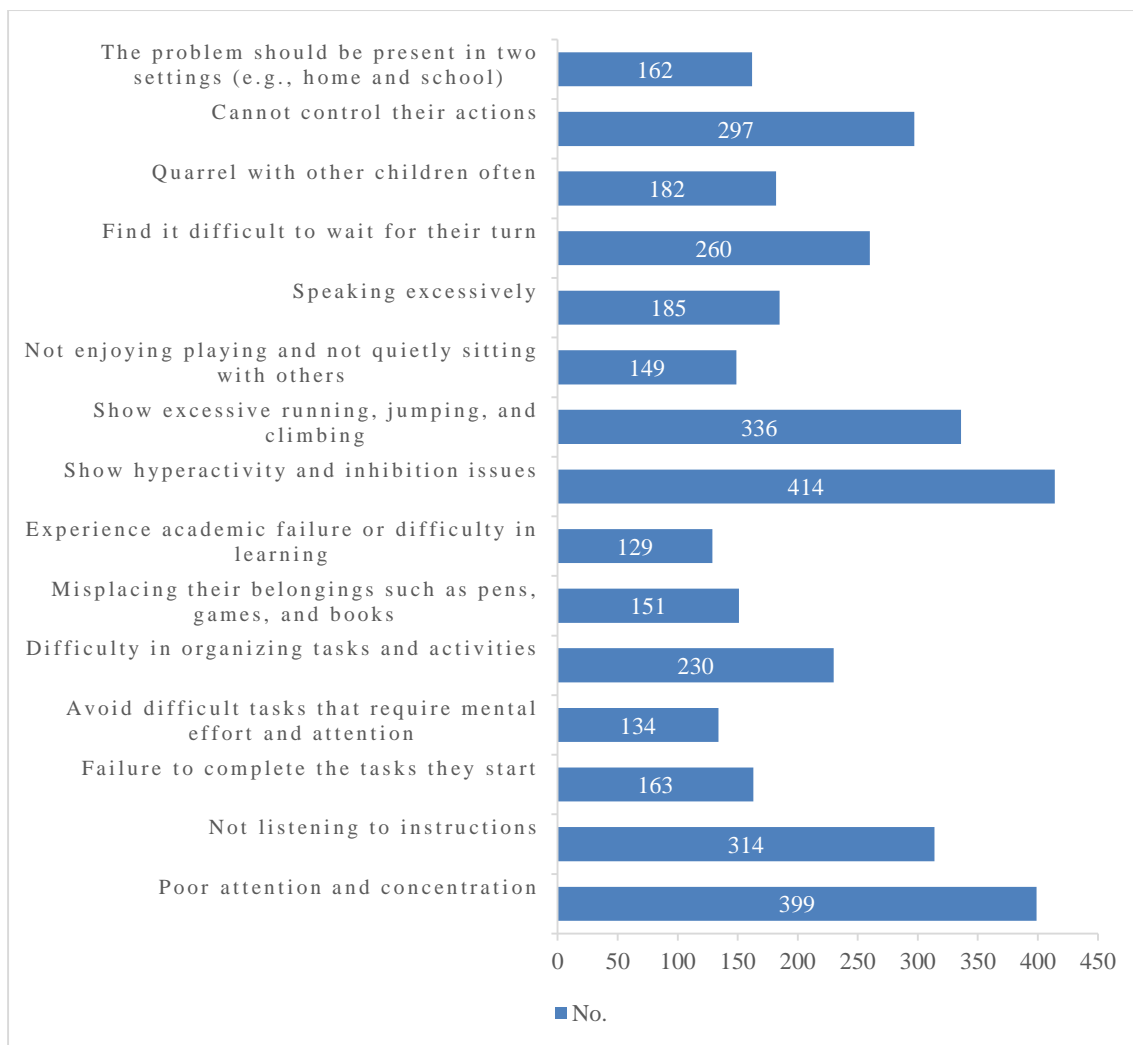
<b>Food preservatives and dyes</b>	21	3.9
<b>Smoking</b>	2	0.4
<b>Multi-cause disorder</b>	427	80.0
<b>Treatment:</b>		
<b>Behavioral therapy</b>	106	19.9
<b>Medication</b>	14	2.6
<b>Medical and behavioral therapy</b>	401	75.1
<b>There is no treatment for ADHD</b>	13	2.4

On the last part of the questionnaire as shown in (Table 3), which assess the participants' ability to recognize the diagnostic signs and symptoms of ADHD according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V) criteria, (n= 399, 74.7%) of the participants agreed that ADHD patients have poor attention and concentration, similar to (n=414, 77.5%) who were convinced that patients suffer from hyperactivity and inhibition issues. (n=314, 58.8%) believed that the affected persons do not listen to the instructions given to them and (n=163, 30.5%) noted that patients fail to complete the tasks they started. A quarter of the participants (n=134, 25.1%) thought that patients avoid difficult tasks which require mental effort and attention and (n=230, 43.1%) considered that ADHD patients face difficulty in organizing their tasks and activities. (n=151, 28.3%) of responders agreed that ADHD patients misplace their belongings such as "pens, games, and books", (n=129, 24.2%), (n=260, 48.7%) believed that patients encounter academic failure or difficulty in learning and difficulty waiting for their turn, respectively. Interestingly, (27.9%) thought that patients do not enjoy playing and do not sit quietly with others, as (34.6%) thought they show excessive speaking.

Of the total participants (n=182, 34.1%) only, were agreeing that the child quarrels with other children often, while (n=336, 62.9%) thought that patients show excessive running, jumping and climbing. Lastly, (n=297, 55.6%) believed that the patient cannot control his actions and (n=162, 30.3%) agreed that these different signs and symptoms should be demonstrated in two settings for instance at home and school (Figure 1).

**Table 3** Signs and symptoms based on the DSM-V criteria for ADHD

	<b>N</b>	<b>%</b>
<b>Poor attention and concentration</b>	399	74.7
<b>Not listening to instructions</b>	314	58.8
<b>Failure to complete the tasks they start</b>	163	30.5
<b>Avoid difficult tasks that require mental effort and attention</b>	134	25.1
<b>Difficulty in organizing tasks and activities</b>	230	43.1
<b>Misplacing their belongings such as pens, games, and books</b>	151	28.3
<b>Experience academic failure or difficulty in learning</b>	129	24.2
<b>Show hyperactivity and inhibition issues</b>	414	77.5
<b>Show excessive running, jumping, and climbing</b>	336	62.9
<b>Not enjoying playing and not quietly sitting with others</b>	149	27.9
<b>Speaking excessively</b>	185	34.6
<b>Find it difficult to wait for their turn</b>	260	48.7
<b>Quarrel with other children often</b>	182	34.1
<b>Cannot control their actions</b>	297	55.6
<b>The problem should be present in two settings (e.g., home and school)</b>	162	30.3



**Figure 1** Signs and symptoms based on the DSM-V criteria for ADHD

#### 4. DISCUSSION

Attention deficit hyperactivity disorder (ADHD) is one of the commonest childhood mental disorders, as it is associated with serious comorbidities including sleep disorders, learning deficit, and psychiatric disorders (See et al., 2021). This is why we need the general population to have awareness about such a common, serious condition that requires early recognition (See et al., 2021). Our study aims to assess the awareness and knowledge of ADHD among the general population of Makkah, Saudi Arabia in where there is a lack of studies about ADHD. The results showed that the overall knowledge of the general population of Makkah about ADHD was fair. Most of the study participants were aging between 15-25 years of age. (58.2%) of the participants were female and (41.8%) male, whereas in a similar study conducted in Hail region (Al-Bluwe et al., 2020), (83.9%) of the participants were female and (16.1%) were male. The vast majority of our participants (94.2%) have heard about ADHD in contrast to a study conducted by University of Chicago among United States of America residents (McLeod et al., 2007) showed lower percentage (64%).

We have found that social media is the main source of information regarding ADHD for Makkah population which is similar to the study conducted in Hail region (Al-Bluwe et al., 2020), followed by reading medical websites and through previous experience with ADHD patient; reflecting the prevalence of ADHD. Although social media is not the optimal source of information, yet it provides elemental knowledge, hence there should be supervised and reviewed content on relevant social media platforms to enhance the knowledge and correct false information regarding ADHD. Despite that many participants believed ADHD to be a mixed behavioral, neurological and psychiatric disorder; there were a considered number of participants that presumed ADHD to be only a behavioral disorder. Moreover, (80%) of participants believe that ADHD is a multi-cause disorder dissimilarly when compared to a study conducted in Madina region (Alghamdi et al., 2017) only (19.4%) of participants believe that ADHD is a multi-cause disorder.

However, we have noticed that many participants were not completely oriented about the symptoms and the disease presentations in the affected person with ADHD in contrast to the study conducted in Hail region (Al-Bluwe et al., 2020) which showed higher orientation level regarding ADHD signs and symptoms. The most common recognizable sign by the participants is that the patient “shows hyperactivity and inhibition issues” followed by “poor attention and concentration”. The least recognizable sign is that they “experience academic failure or difficulty in learning”; thus, we think that it’s very important to clarify these diagnostic signs and symptoms. Furthermore, most of the study participants believed that combination of medical and behavioral therapy is the most efficient modality of treatment.

## 5. CONCLUSION

This study showed the awareness and knowledge level of Makkah general population regarding ADHD, based on our findings we recommend raising the awareness of ADHD through educational campaigns, online videos, as we encourage the specialists to utilize their social media accounts in order to explain the disorder nature, causes, signs and symptoms as well as the treatment methods and its importance. Therefore, we advocate for further similar studies in different regions of the kingdom of Saudi Arabia which would benefit from a larger study sample to get more accurate and generalized results and correlate these results with the participants’ gender, age, and educational level.

### Ethical approval

The study was approved by the Medical Ethics Committee of Umm Al-Qura University (ethical approval number: HAPO-02-K-012-2022-05-1086).

### Informed consent

Informed consent was obtained from participants at the beginning of the electronic questionnaire.

### Acknowledgment

The authors would like to thank all the participants who contributed in this study.

### Funding

This study has not received any external funding.

### Conflicts of interest

The authors declare that there are no conflicts of interests.

### Data and materials availability

All data associated with this study are present in the paper.

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