

# Awareness of ASD early signs among primary health care physicians in Riyadh, Saudi Arabia.

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## Abstract

**Primary Healthcare Physicians (PHCP) play an important role in early detection of Autism Spectrum Disorder (ASD). This study aims to assess the awareness of the PHCP of ASD early signs, identify the limiting factors affecting their knowledge, and discuss the preferred methods to fill in the knowledge gap. This cross-sectional study was conducted among 147 PHCP working in primary care centres and major hospitals in Riyadh, Saudi Arabia. The physicians were recruited through convenient sampling technique. A written questionnaire was used for data collection. The study findings revealed poor level of knowledge of ASD early signs among PHCP in Riyadh. A significant positive association was appreciated between the total mean knowledge score with both job title and experience years. Physicians who received prior psychiatry training were noted to have higher level of knowledge about ASD early signs. Since PHCP are first liners in receiving caregiver's complaints, it is imperative to enhance their knowledge about ASD early signs to avoid delays in provision of acquired services to those children which adversely affects the health needs and quality of life of ASD children and their caregivers. Thus, it is recommended to provide specific training in ASD presentation and ASD screening tools.**

**Keywords:** Primary healthcare physicians, General practitioner, Family physicians, Autism, ASD, Early signs, Riyadh, Saudi Arabia.

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## Introduction

Having a child with Autism Spectrum Disorder (ASD) has significant adverse effects on the quality of life for children and their families. ASD is a pervading and lifelong disorder that is characterized by persistent deficit in social, verbal and nonverbal communication and repetitive behaviors with restrictive interests that start in early childhood ("Early Warning Signs of Autism Spectrum Disorder[CDC," n.d.) ("NIMH » Autism Spectrum Disorder," n.d.). Autism appears to be growing fast with a significant increase in incidence over the years. Compared to year 2000, where 1 in 150 children is identified with the disorder, in 2014 its incidence increased up to 1 in 59. Children with ASD can experience difficulties with language, speech, behaviors, learning, motor skills and cognitive abilities. A recent study in Taif, KSA has shown an estimated ASD prevalence of 0.035% in children 3-7 years and the Saudi Ministry of Health reports a worldwide prevalence of ASD of 1:160 children ("Health Days 2020-World Autism Awareness Day," n.d.). Although the worldwide incidence of ASD is increasing, its identification may be delayed due to the possible lack of awareness among healthcare workers of ASD's early presenting symptoms and signs.

The primary health care system in Saudi Arabia is the port of entry to the health system for the majority of the population. There is shortage of the primary health care physicians in Saudi Arabia as it is in most of the world [1]. In KSA there is 3 PHCP for 10,000 inhabitants. Multiple studies have shown the poor level of knowledge amongst PHCP of the diagnostic criteria of ASD, its early signs and evidence based intervention plans.

Many professionals in different disciplines had shown misconceptions regarding social, emotional, and cognitive aspects of autism due to limited and inaccurate knowledge regarding the disease. Furthermore, general practitioners appear to have suboptimal awareness of the etiology, signs, symptoms and other aspects of ASD.

There is great evidence indicating the advantages of early intervention at a younger age. Intervening early will help reducing the associated disabilities and impairments, and further enhance the quality of life in the affected children. Such intervention should be recommended by the primary health providers as they have a vital role in health care delivery and they are the first line in which the child with ASD can present to [2]. Primary care physicians' knowledge of early signs of ASD is crucial to the provision of services, prevention of delayed diagnosis, improvement of the outcomes, and reduction of the burden that may be associated with the disorder.

The assessment of any knowledge gap is important as most of the primary care health professionals have little or no formal training in children's developmental or behavioural disorders including ASD. This research paper aims to assess the level of awareness of the primary health care physicians of the early signs of ASD in children by determining the level of knowledge possessed by PHCP in addition to identifying the limiting factors affecting their knowledge acquisition, and finally discussing preferred methods required to enhance and fill in the knowledge gap.

## Literature review

This cross-sectional study was conducted among primary health care physicians working in primary health centers and major hospitals in Riyadh, Saudi Arabia. Allowing an error rate of 12%, level of confidence of 95% ( $\alpha=0.05$ ), power of the study of 80% ( $\beta=20\%$ ); and with prior estimate that the average satisfactory level of knowledge among primary health care physicians is about 50%, the minimal sample size that was required for the current study is 128 as calculated by STATA. To compensate for any missing data in the questionnaire, the sample size was increased to 150.

The reliability of data collection tools was based on a pilot study of 15 questionnaires among PHC physicians first, then 150 primary health care physicians were recruited through convenient sampling technique from three public hospitals and various primary health care centers in different areas of Riyadh that represent the major districts. A verbal consent was obtained from all participants. The questionnaire was divided to six sections; the first included sociodemographic data. The second section explored physicians' previous exposure to ASD. Sections three and four consisted of twenty-eight questions on the general knowledge of ASD and its early signs in children, with a cutoff score of more than or equal to nineteen correct answers for good knowledge. The fifth part of the questionnaire included questions to identify the overall opinion of the current level of awareness among PHC physicians. The last part of the questionnaire, estimated the physicians' awareness about specialized centers for ASD available in Riyadh, the method of referral for suspected cases of ASD, and the limiting factors for PHC physicians to get training in ASD.

IBM SPSS 16.0 was used for data entry and analysis. Descriptive statistics in form of mean  $\pm$  standard deviation of frequencies, percentages, and proportions were used for numerical, categorical and nominal data respectively. Chi square test was used to test for statistical difference between categories. ANOVA and T-test were used to test for statistical difference between variables. P value of less than 0.05 was considered as statistically significance. The study has been approved by IRB of Princess Nourah bint Abdulrahman University (H-01-R-059), King Abdullah International Medical Research Centre (IRBC/0296/19), King Abdulaziz City for Science and Technology (19-0021), and King Fahad Medical City (19-122E).

One hundred and fifty questionnaires were distributed to primary health care physicians in Riyadh city. A total of 147 participants were included in the analysis, where 40% of them were males and 60% were females, with a mean age of 36.2 years old. About half of the respondents were training residents (52%), third of the participants were specialists (32%), and the minority were consultants (16%). The level of knowledge of ASD early signs among General Practitioners (GPs) and Family Medicine practitioners (FM) based on years of experience.

Overall, the majority of the participants showed low level of knowledge of the ASD early signs but the longer experience

was significantly associated with better level of knowledge of ASD signs among GPs but not among FM. Most of the GPs (>70%) regardless of experience years have correctly answered that autistic children have a communication defect, poor eye contact and that ASD symptoms can vary in severity. A small and almost equal percentage of both groups have agreed that one of the characteristics of ASD is delayed speech (29%,  $\leq 10$  experience years, 30% >10 experience years), lack of pointing to needs at 18 months of age (10% >10 experience years, 16%  $\leq 10$  experience years) and unusual finger movements near their eyes (30% >10 experience years, 32%  $\leq 10$  experience years). On the other hand, GPs with more than 10 experience years showed better knowledge about some of the early signs of ASD, such as the repetition of some words or phrases after hearing them (38%  $\leq 10$  experience years, 60% >10 experience years) and that most ASD children appear deaf (32%,  $\leq 10$  years and 80%, >10 years).

The majority of FM physicians have correctly identified that children with ASD should have a communication defect associated (83% of <10 years of experience and 92% of >10 years of experience), ASD symptoms vary in severity (88% of <10 years of experience and 86% of >10 years of experience) and have poor eye contact (87% of <10 years of experience and 86% of >10 years of experience). Regardless of the experience years, the majority of FM identified lack of eye contact and failure to develop peer relationship as early signs of autism. Moreover, FM physicians with experience of more than 10 years were able to identify repetitive hand flapping or twisting whole body movements (67%) and decrease sensitivity to pain and temperature (31%) higher than the those with 10 years of experience or less (38%) and (7%). The least identified early sign of ASD in children was pointing to needs before 18 months, <10 years of experience (13%) and >10 years (17%). Knowledge Score of ASD in Children Among PHC Physicians and its relation to different variables. The total level of knowledge was found to be low with a significant positive effect to the years of experience, job titles which can be related to years of experience and to having previous psychiatry training. Other variables like age and gender did not show significant difference.

The attitude of participants towards ASD knowledge, the factors limiting their knowledge and their preferred training methods. Overall, attitudes were similar between different PHCP and showed no significant relation neither to specialty (GP vs FM) nor to specific training in psychiatry or pediatrics. The majority of PHCP expressed their need to have more training in ASD early signs through training workshops wither they were accredited with continuous professional development points or not.

## Discussion

The study findings revealed a poor level of knowledge possessed among PHC physicians in Riyadh concerning ASD early signs in children. A significant positive association was appreciated between the total mean knowledge score with both job title and experience years [3]. In addition, physicians who received prior psychiatric training were associated with higher

level of knowledge about ASD early signs than untrained physicians or those who received pediatrics training. Although there was lack of awareness among PHC physicians, almost half of the physicians stated that they are not satisfied with their current training to identify early signs of ASD in children.

Primary health providers have an essential role in early diagnosis and intervention of an autistic child, as they are the first line in contact with a suspected case. Early diagnosis through identifying the early signs of ASD will improve the outcomes, reduce the burden, disabilities and impairments associated with this disorder. According to a previous study, early intervention in an appropriate educational setting for at least two years during the school years can result in significant improvements in language, cognitive ability, and social skills for many children with ASD. Consequently, a sufficient level of knowledge must be satisfied to create great confidence in identifying the early signs of ASD.

The first aim of this study was to determine the level of knowledge possessed by PHC physicians on ASD early signs in Riyadh city. Overall, PHC physicians lack sufficient knowledge concerning the early signs of ASD in children. This deficiency of awareness among PHC physicians can lead to impediment in the diagnosis, and a delay in starting the management of an autistic child, which can lead to further deterioration of the condition itself [4]. This is evidenced by multiple studies which have reported that autism diagnosis is often missed due to deficiency in awareness of ASD etiology and knowledge of the diagnostic criteria by physicians. Those two studies enrolled GPs and FM at different stages of training and practice from fresh graduates to physicians with long experience. Inclusion of fresh graduates could have played a role in the overall low level of knowledge. A systematic review has shown that the majority of studies exploring physician's knowledge of ASD reported inadequate level of knowledge of autism with significant lack of understanding major clinical features of autism and the studies that reported high level of knowledge were conducted in western countries. A study done in UK has reported that GPs have high basic knowledge of ASD key characteristics. This difference can be contributed to the fact that the questions used to assess the knowledge of the GPs was generally concerned with the most common characteristics of ASD, unlike this study which focused on early signs of autism and not only the key criteria. Moreover, the mean age of this study was 36.2 years, unlike the study done in UK where the mean age year was 45.4 years. Having a higher mean age year can reflect the experience which the physician might have gained by greater contact with patients over the years, and thus having a higher level of knowledge possessed.

In this study, positive correlation was recognized between both job title and experience years with the total mean knowledge score. Thus, the greater the experience years the more likely the physician will be able to recognize the early sign of ASD in children which could reflect longer experience, more training and being presented with higher number of patients with ASD symptoms. Similar results were found in Egypt and Nepal where years of experience were positively associated with

higher scores of knowledge. In Nigeria, longer years of experience was related to increased knowledge about communication and language deficit being parts of the presentation of ASD and did not show relation to knowledge about other deficits or comorbidities. This is different from what was found in Australia where better knowledge was related to less years of experience and from Pakistan where fresh graduates had better knowledge [5]. Those differences could be due to better enrichment of undergraduate curriculums in materials related to child development and developmental disorders. In their systematic review, McCormack et.al. found that studies reported 7 predictors of knowledge out of which age and years of experience had variable correlations between studies. Other predictors that were correlated to good knowledge were personal connections with autism, receiving continuing medical education about autism, previous experience with autism, male gender and being pediatrician. Being a GP was associated with lower knowledge scores.

The second aim of this study was to identify the limiting factors affecting the knowledge of PHC physicians of ASD early signs. Although most of the participants show poor level of knowledge of ASD early signs in children, only the minority acknowledged and believed that there is low level of awareness among PHCP. This reflects poor attitude of PHCP towards the current low level of awareness and knowledge gap of early signs of ASD in children which was different from GPs in remote Canadian areas who expressed moderate to high need for child and adolescent psychiatry. It appears that amending medical schools curriculum and engaging medical students with autism research is an important strategy to improve knowledge and attitude of GPs toward autism. Furthermore, this study revealed the main limiting factor identified to affect the awareness of PHC physicians regarding ASD early signs is having barriers to access effective ASD training. Almost half of the PHCP reported that it is not easy to access training that will allow them to acquire skills needed to detect the early sign of ASD in children. A previous study showed similar overall opinion, in which GPs in the UK reported having limited confidence in diagnosing and managing an autistic child, partly due to limited access to autism training and confusion around diagnostic and care pathways. In this study, the three most reported limiting factors to access such training by PHCP were unavailability of training, having a busy schedule, and no time allocated by their bosses. To overcome these limiting factors, more time should be allocated by the institutions for training programs, and accreditation should be presented for physicians attending such programs. Moreover, providing undergraduate ASD training can benefit in overcoming such limiting factors and increasing the awareness of ASD early signs among PHC physicians. As it is evidenced by the research conducted, improved performance among medical doctors was observed in promoting mental and behavioral health, by the newly developed psychiatry curriculum that enabled Malawi's medical students to address mental issues.

The third aim of the study was to identify methods of improvements or alterations required to enhance the awareness

of PHCP of ASD early signs. This study showed that two thirds of the PHCP prefer clinical training with specialized professionals as an effective method to improve their knowledge of ASD's early signs, in comparison with other methods such as an online course or a 3 days short workshop. Having a prior training can magnify the level of knowledge possessed by PHC physicians and thus increase the level of confidence in identifying and managing the cases suspected or diagnosed with autism. A recent study conducted in the UK shows that GPs with high basic level of knowledge of ASD signs and symptoms related their confidence through greater experience with autism to prior training in autism. Furthermore, it has been seen that providing health professionals by five 3-hours weekly training sessions has increased the mean total knowledge scores of ASD, improved practices and increased the rate of proper referrals for ASD diagnosis. A similar study done in Pakistan, revealed that it is imperative that GPs are trained to recognize ASD through development and delivery of ASD educational material in medical school curriculum as well as providing medical education regarding ASD to the practicing physicians.

Although clinical training is perceived to be the most effective method by PHCP, it will require more resources and funding in comparison with other methods, such as online workshops. The second most common method preferred by the participants of this study was CME workshops. This can be reasoned as CME workshops can be more time efficient, as it does not require taking full days off from work, in addition to its effectiveness in developing knowledge necessary for the diagnosis and recognition of ASD early signs.

On the other hand, online courses were not favoured by PHCP as a method to increase the level of awareness about ASD early signs, although they are simple, they do not consume a lot of time, and are readily available more than the other options. This might be due to the fact that online courses in comparison with other methods are perceived to not provide the full physical experience and human interactions.

In Canada, GPs in rural and remote areas preferred to receive training in child and adolescent psychiatry through CMEs in their community to other types of training like conferences or small group teachings. Family medicine residents found the most favoured method of learning child and adolescent psychiatry to be the case presentation and live teaching–consultation method while the least useful was didactic lectures. They emphasized the importance of learning the interview techniques and to be involved in experiential teaching to be most useful for better experience in learning and achieving objectives.

## Conclusion

In conclusion, the study findings revealed a poor level of knowledge possessed among PHCP in Riyadh concerning the early signs of ASD. As the GPs and FM physicians are likely

to be the first contacts with an autistic child, a suboptimal awareness of identification of early signs and symptoms of ASD can lead to delayed diagnosis and introduction of intervention which adversely affects the health needs and quality of life for children with autism and their caregivers. Consequently, actions should be taken to improve the awareness among PHCP in KSA, such as special educational programmes and use of simulation and online courses. Future studies are recommended to assess the knowledge of ASD early signs among PHCP in all provinces of KSA.

According to this study, the most preferred method of education identified is clinical training with specialized professionals, which can be prepared and provided routinely by institutions to their PHCP. Future studies are recommended to evaluate the effectiveness of training programs in increasing the level of knowledge about ASD among PHC physicians and to compare online to live courses and workshops. Moreover, authorities should provide structural official guidelines according to which all primary health care physicians would conduct the correct process in managing suspected or diagnosed cases of autism, thus facilitating referrals and improving the overall healthcare delivery system.

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