
Assessing the level of knowledge of Autism Spectrum Disorder (ASD) among medical consultants

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Abstract

Background: There has been a worldwide reported increase in the prevalence of Autism spectrum disorder (ASD). There is also an international recognition of the value of early diagnosis and intervention of children with ASD. A lack was identified in the literature in KSA regarding assessing ASD knowledge among medical consultants. **Aims:** firstly, to assess ASD knowledge among medical consultants in KSA. Secondly, to investigate if there is any differences between medical consultants based on their years of experience and subspecialties. **Method:** KCAHW questionnaire was utilized to collect data from 53 consultants at a university hospital in KSA. **Results:** the level of ASD knowledge among medical consultants in KSA was low. Moreover, years of practice as consultants were discovered to be non-significantly correlating with ASD knowledge. Finally, the level of ASD knowledge was significantly affected by subspecialties in all the domains of KCAHW. **Conclusion:** more formal training on ASD and the integration of it in medical curriculum is needed to increase the level of knowledge in medical staff for early and better detection of ASD.

Key words: Autism, Autism spectrum disorder, ASD knowledge, medical education, medical curriculum.

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تقييم مستوى المعرفة باضطراب طيف التوحد (ASD) بين

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المخلص

الخلفية: هناك ازدياد ملحوظ في معدل انتشار اضطراب طيف التوحد (ASD) كما ان هناك أيضًا اعتراف دولي بقيمة التشخيص والتدخل المبكر للأطفال ذوي التوحد. تم ايجاد نقص في الأدبيات في المملكة العربية السعودية فيما يتعلق بتقييم المعرفة باضطراب طيف التوحد بين الاطباء الاستشاريين. **الأهداف:** أولاً ، تقييم معرفة اضطراب طيف التوحد بين الاستشاريين الطبيين في المملكة العربية السعودية. ثانيًا ، التحقق مما إذا كان هناك أي اختلافات بين الاستشاريين بناءً على سنوات الخبرة والتخصصات الدقيقة. **الطريقة:** تم استخدام استبيان KCAHW لجمع البيانات من ٥٣ استشاريًا في مستشفى جامعي في المملكة العربية السعودية. **النتائج:** كان مستوى المعرفة باضطراب طيف التوحد بين الاستشاريين في المملكة العربية السعودية منخفضًا. علاوة على ذلك ، تم اكتشاف أن سنوات الممارسة كاستشاريين لا ترتبط بشكل كبير بمعرفة اضطراب طيف التوحد. أخيرًا ، تأثر مستوى معرفة اضطراب طيف التوحد بشكل كبير بالتخصصات الفرعية في جميع مجالات KCAHW. **الخلاصة:** هناك حاجة إلى مزيد من التدريب الرسمي على اضطراب طيف التوحد ودمجه في المناهج الطبية لزيادة مستوى المعرفة في الطاقم الطبي مما قد يسهم في الكشف المبكر عن اضطراب طيف التوحد. الكلمات المفتاحية: التوحد ، اضطراب طيف التوحد ، المعرفة باضطراب طيف التوحد ، التعليم الطبي ، المنهج الطبي.

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Introduction:

There has been a worldwide reported increase in the prevalence of Autism spectrum disorder (ASD) (APA, 2013). This increase in prevalence might be attributable to increased knowledge and awareness among the public as well as health care workers and/or the implementation of broader criteria in ASD diagnosis (Alharbi, 2018). Even though knowledge and research on ASD are growing in some parts of the world, there remain a limited knowledge and research attention in other parts (Igwe et al., 2010).

There is an international recognition of the value of early diagnosis and intervention of children with ASD even though there is a delay in their diagnosis (Self et al., 2010). The early detection of ASD is important as it accelerates the early referral of children to services (Garg et al., 2014).

Moreover, it has been found that early detection and provision of intervention services can improve long-term outcomes in children with ASD including their language development and social skills (Bryson et al., 2007).

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Although there has been more research on autism and more efforts to increase knowledge and awareness about it worldwide, most of the studies in the literature described a wide discrepancy among health care providers in terms of the diagnosis and treatment of ASD (Fombonne, 2005). Stone et al. (2000) showed that many experts in many fields did not have a sufficient knowledge of ASD and its indicators in children. Early recognition of ASD symptoms would lead to a favorable outcome in children with autism (Stone et al., 2000). Recent studies argued that the early detection and provision of the right intervention for children with ASD in developed countries as well as the availability of multidisciplinary specialist care services can lead to positive outcomes for those children (Reichow, 2012). On the other hand, several studies in developed countries disclosed very late detection and diagnosis of ASD. A study in United Kingdom found that ASD was only detected in 8.0% of children on their first clinic visit and that the mean age of ASD diagnosis is 7 years, which is way after the recommended age for diagnosis at 3 years (Wilkinson, 2011).

In the Kingdom of Saudi Arabia (KSA), there are no formal referral method to diagnosis centers for the detection of neurodevelopmental disorders in children and child psychiatric services are still not available in all the small cities which put a huge efforts on health care workers including pediatricians and nurses for the early detection and diagnosis of ASD (Helmy, 2017).

Literature review:

In spite of the increase in awareness and research on childhood ASD in many countries around the world, there is still a lack of enough epidemiological research regarding ASD, its detection methods, diagnosis, and efficacy of interventions (Rahbar et al., 2011). Studies that have been conducted in many countries have revealed insufficiencies in knowledge about ASD among medical staff including general practitioner, pediatricians, nurses, medical students etc.

Samar et al. (2018) investigated knowledge about ASD among health care workers in family centers in Cairo including nurses and family physicians using KCAHW (Knowledge about Childhood autism among health workers) and found ASD knowledge to be significantly correlated with practitioner's' years of practice in general practitioner and that their mean knowledge score to be low (8.53 ± 2.54). Moreover, Hend (2017) used the KCAHW to assess autism knowledge about ASD among family Physicians in Egypt and found the knowledge to be low with a total mean score (11.2 ± 3.5) and a significant correlation between KCAHW mean score and the duration of the physicians' practice. Both studies did not include any medical consultants.

Igwe et al. (2010) studied knowledge about ASD among final year medical students, nursing, and psychology students in Nigeria. They used the KCAHW and found that ASD knowledge among the three groups to be low (10.67 ± 3.73) compared to other studies and that the total mean score for nursing and psychology students were higher than medical students (Igwe et al., 2010). However, the total mean score

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for medical students were positively correlated with number of weeks those students was trained in the pediatric and also the psychiatric department. In another study by Esegbe et al. (2015) they assessed knowledge about ASD among medical doctors in Nigeria. They used the KCAHW and found that pediatricians and psychiatrists to display good knowledge (KCAHW score ≥ 15) while general practitioner display poor knowledge (KCAHW score < 15). The total mean score for knowledge was significantly associated with the subspecialties of pediatricians and psychiatrists (Esegbe et al., 2015). In Sri Lanka Rohanachandra et al. (2017) has studied knowledge of ASD among medical doctors and they found that the majority of participants (61.9%) were lacking knowledge about ASD and that postgraduate medical residents have significantly higher knowledge than medical officers.

Few researchers in KSA have studied ASD early detection among medical staff and very little is known in the literature about physicians' knowledge of childhood ASD. A study by Hayat et al. (2019) has measured ASD knowledge among medical staff using KCAHW and their sample included all the medical staff at the hospital including for example general physicians, consultants, medical students, and occupational therapists. They found that the mean score for physicians were low (9.6 ± 3.28) compared to non-physicians (11.2 ± 4.41) (Hayat et al., 2019). They also found that participants with more years of experience display a significantly more knowledge. Another study by Helmy (2017) assessed

knowledge about ASD using KCAHW among medical students at Taif University in KSA. He found that knowledge mean score among 6th year students (8.99 ± 1.91) was significantly higher than second year students (6.44 ± 2.24) (Helmy, 2017).

Almost all the studies discussed above except Esegbe et al. (2015) have found knowledge of ASD to be low among medical staff. Low level among medical staff is an issue that need to be considered in future studies as those people play an essential role in the early detection and diagnosis of ASD. Most studies indicated a significant relationship between ASD knowledge and years of experience for medical staff (Hayat et al., 2019; Helmy, 2017; Hend, 2017; Igwe et al., 2010; Rohanachandra et al., 2017; Samar et al., 2018) and with their subspecialty (Esegbe et al., 2015; Hayat et al., 2019). None of these studies have examined the reasons behind this low level of knowledge, which is important to be able to find better solutions and suggestions for improvement within the medical curriculum. This is because low level of ASD knowledge could have been presented in the discussed studies above due to the focus on collecting information from all medical staff including medical students who still did not get their medical licenses, as none of these studies have focused on medical consultants who are considered to be specialists in their fields and the ones usually responsible for guiding and training other medical staff in their teams. Moreover, a lack was identified in the literature in KSA regarding assessing ASD knowledge among medical consultants. To the best of the author knowledge, no study was identified in the literature to assess ASD knowledge

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among medical consultants in KSA and whether they vary according to years of experience and subspecialty.

Aims of the study:

The first aim of this study was to assess ASD knowledge among medical consultants in KSA. The second aim was to investigate if there is any differences between medical consultants based on their years of experience and subspecialties.

Questions of the study:

Q1: What is the current ASD knowledge among medical consultants in KSA?

Q2: Is there any differences in ASD level of knowledge among medical consultants based on their years of experience and subspecialties?

Importance of the study:

Physician's knowledge of ASD has been showed to greatly influence the average age of diagnosis in children (Rhoades et al., 2007). In addition, the average delay from first detection to diagnosis is estimated to be four to two years (Rhoades et al., 2007). Therefore, it is expected that the level of medical consultants' knowledge of ASD would greatly affect the average age of diagnosis and detection (Bakare & Munir, 2011). Poor or low knowledge of ASD, especially among medical consultants can delay early diagnosis and provision of interventions. Therefore, for the delivery of optimal services for ASD children and their families, it is essential to assess ASD knowledge in people who are in charge like medical consultants and identify the gaps in their knowledge to be

addressed in future medical curriculum and professional continues development programs.

Methods:

Sample:

The target population for this study were medical consultants in all departments in King Abdulaziz university hospital in Jeddah. The sampling technique used in this study was the convenience sampling. Consents were obtained from consultants to participate voluntarily in the study through a statement at the electronic beginning of the survey link.

Procedure:

This study was a survey based descriptive study that utilized a validated questionnaire to collect data. Electronic links to the questionnaires were sent to all medical consultants through departments What's App groups and other means of communication. The links were created using Google docs. The study was conducted between January and March 2019. The questionnaires used in this study were a general demographics questionnaire to collect information about the participants and the KCAHW questionnaire which is a validated and reliable tool for assessing knowledge of health workers about ASD (Bakare et al., 2008). It has been utilized in many countries and in different languages around the world (Igwe et al., 2010; Ozdemir et al., 2020; Rohanachandra et al., 2017). This study used the original English version as the sample was medical consultants who master English language. KCAHW is a self-administered questionnaire that consist of 19 items and each of the items has three options to select from with only one of these three options being correct. The correct option on each item gets a score of one, while the

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other two options that are incorrect gets a score of zero. The questionnaire is divided into four domains:

Domain 1

Contained eight item questions that addressed the problems in social interaction found in children with ASD. A maximum and minimum score of 8 and 0 respectively are possible in this domain.

Domain 2

Contained only one item question that addressed challenges in area of communication and language development, which is part of symptoms of ASD. A maximum and minimum score of 1 and 0 respectively are possible in this domain.

Domain 3

Contained four item questions that addressed area of obsession and compulsive pattern of behavior including repetitive and stereotyped behaviors found in children with ASD. A maximum and minimum score of four and zero respectively are possible in this domain.

Domain 4

Contained six item questions that addressed information on what type of disorder is ASD, possible co-morbid conditions and onset of childhood ASD. A maximum and minimum score of six and zero respectively are possible in this domain.

Therefore, a maximum and minimum total score of nineteen and zero respectively are possible when the four domain scores are added together. The mean total score on

KCAHW questionnaire among a sample is a measure of level of knowledge about childhood autism among that sample.

The questionnaire was validated by (Bakare) and the cronbach's alpha value was acceptable 0.97. and the correlation coefficient in score total after two administration was 0.99. The questionnaire in this study has been shown to be reliable with cronbach's alpha coefficient value of 0.71.

Data analysis:

The data was analyzed using IBM SPSS statistic 24 software (Corp, 2013). The validity and reliability of the questionnaire was tested by Pearson correlation and Cronbach's alpha respectively. Descriptive analysis was done to calculate frequencies and percentages. Mean and standard deviation of the whole sample along with mean percentage score were calculated. Comparison of mean scores for different domains by different demographic characteristics was done by applying independent t test and one-way analysis of variance.

Results:

Demographic characteristics are shown in Table 1 and figures 1 and 2. A total of 53 medical doctors (consultants) from King Abdulaziz university hospital have participated in this study. There were 24 (54.7 %) males and 29 (45.3 %) females. Mean age of the sample was 43.6 yrs (SD \pm 6.9). This sample consisted of 5 subspecialties. Surgery was the most prevalent (37.7 %), followed by endocrinology (28.3 %), then medicine (18.9 %) and nephrology (11.3 %), while obstetrics was the least frequent (3.8 %). Regarding years of practice as a consultant, the majority of the sample (approximately 70 %) were practicing for five years or more,

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while about 30 % of them had practiced less than five years. Residency training of the sample was accomplished by 51 % in KSA, 7.5 % in other Arab countries (Sudan, Yemen), and 41.5% in other western countries (UK, France, and Canada). There was no previous formal training identified for ASD for consultants.

Table 1: Sociodemographic characteristics of the medical consultants (n = 53)

Demographic characteristics	N	%
Gender		
Male	24	45.3
Female	29	54.7
Age		
<40	17	32.1
40 - <50	24	45.3
≥50	12	22.6
Specialty		
Surgery	20	37.7
Endocrinology	15	28.3
Medicine	10	18.9
Nephrology	6	11.3
Obstetrics	2	3.8
Years of practice (As a consultant)		
<5	16	30.2
5 - 10	11	20.8
>10	26	49.0
Residency training		
Saudi Arabia	27	51.0
Arabic countries*	4	7.5
Other countries**	22	41.5
Previous formal training in autism		
Yes	0	0.0
No	53	100.0

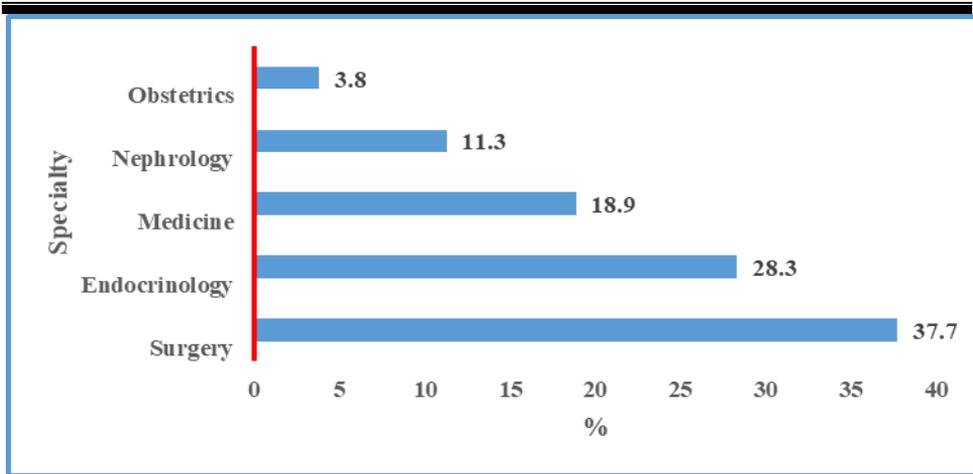


Figure 1. Percentage of participants in subspecialties

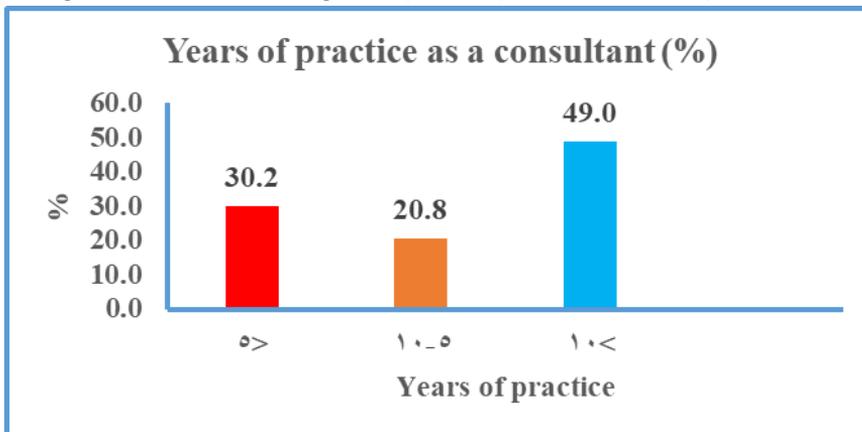


Figure 2. Percentages of participants by years of experiences

Pattern of distribution of scores on the KCAHW questionnaire among participants

Table two displays the total mean score on the KCAHW among the medical consultants that participated in the study which was low 11.9 ± 3.0 . Moreover, the highest mean total score was displayed in Domain 1, which is concerned with questions in the area of social interaction and was 6.4 ± 1.6 . The mean total score in Domain 2 which addresses

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communication impairments was 0.7 ± 0.4 . Domain 3, which deals with questions on obsessive and repetitive behavioral patterns showed total mean score of 2.9 ± 1.0 . Finally, domain 4 that covers questions on ASD general information and possible co-morbidity yielded a total mean score of 1.9 ± 1.2 .

Table 2. Mean scores on the KCAHW among medical consultants in KSA.

Domain	No of items	Mean	SD
Domain 1: Impairments in social interaction	8	6.4	1.6
Domain 2: Impairment in communication	1	0.7	0.4
Domain 3: Obsessive and repetitive behavioral pattern	4	2.9	1.0
Domain 4: Type of disorder autism is and possible associated co-morbidity Physicians with experience of autism Physicians without experience of autism	6	1.9	1.2
Total	19	11.9	3.0

Comparison of the KCAHW mean scores for consultants among years of experiences and subspecialties

The level of knowledge about Childhood Autism in medical consultants among the different demographic variables are shown in Table 3. The knowledge of medical consultants was significantly affected by subspecialty for all domains. Medicine, endocrinology and obstetrics had significantly higher knowledge for total domains greater than the other subspecialty for consultants. Consultants in surgery were significantly the lowest in ASD knowledge among other subspecialties. Different trends between subspecialties were observed among different domains. For domain 1, four

subspecialties (obstetrics, endocrinology, medicine and nephrology) were significantly higher in knowledge compared to surgery. For domain 2, four specialties (nephrology, medicine, endocrinology and surgery) were significantly higher in knowledge compared to obstetrics. For domain 3, four specialties (medicine, endocrinology, obstetrics and surgery) were significantly the highest in knowledge, while nephrology was the lowest in ASD knowledge. For domain 4, medicine was significantly greater in knowledge compared to the other subspecialties observed.

Knowledge of medical consultants was significantly higher among those with greater years of practice as a consultant (≥ 5) for domain 1. On the other hand, significant superiority in knowledge was observed for less years of practice as a consultant (< 5) for domain 3. In addition, the ASD knowledge in consultants with more years of practice (≥ 5) was statistically equal to those of less years of practice (< 5) for domain 4. For domain 2 and total domains, knowledge was not affected by years of practice.

Table 3. Comparison of the KCAHW mean scores for consultants among years of experiences and subspecialties

Demographic characteristic	Total		Domain 1		Domain 2		Domain 3		Domain 4	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Subspecialty										
Surgery	9.80 ^c	1.91	5.20 ^b	1.74	0.50 ^a	0.51	2.70 ^{ab}	0.98	1.40 ^b	0.50
Endocrinology	13.20 ^a b	2.18	7.40 ^a	0.63	0.80 ^a	0.41	3.13 ^{ab}	0.92	1.87 ^b	0.99
Medicine	14.90 ^a	3.70	7.10 ^a	1.66	1.00 ^a	0.00	3.50 ^a	0.97	3.30 ^a	1.89
Nephrology	10.50 ^b c	0.55	6.50 ^{ab}	0.55	1.00 ^a	0.00	2.00 ^b	1.10	1.00 ^b	0.00
Obstetrics	13.00 ^a b	1.41	8.00 ^a	0.00	0.00 ^b	0.00	3.00 ^{ab}	1.41	2.00 ^b	0.00
P	0.000****		0.000****		0.001***		0.047*		0.000****	
Years of practice as a consultant										
<5	10.9	3.4	5.1 ^b	2.1	0.6	0.5	3.5 ^a	0.8	1.8 ^{ab}	1.0
5 – 10	11.5	0.7	7.5 ^a	0.5	0.6	0.5	2.4 ^b	0.7	1.1 ^b	0.5
>10	12.7	3.3	6.8 ^a	1.0	0.8	0.4	2.8 ^b	1.1	2.2 ^a	1.5
P	0.173 NS		0.000****		0.116 NS		0.011*		0.034*	

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NS: Not Significant *P < 0.05 **P < 0.01 ***P < 0.001 ****P < 0.0001

(a, b, c, d): Different letters within a column for each demographic characteristic and domain indicate statistically significant differences

Discussion:

Even though knowledge and research on ASD are growing in some parts of the world, there remain a limited knowledge and research attention in other parts (Igwe et al., 2010). Studies that have been conducted in many countries have revealed insufficiencies in knowledge about ASD among medical staff including general practitioner, pediatricians, nurses, medical students etc. The number of studies conducted in KSA to assess the level of ASD knowledge among medical staff were very limited and did not focus on medical consultants. The first aim of this study was to assess ASD knowledge among medical consultants in KSA. The second aim was to investigate if there is any differences between medical consultants based on their years of experience and subspecialties. To address these aims, this study collected information from medical consultants in KSA using KCAHW to assess their knowledge about ASD.

This study found that the level of ASD knowledge among medical consultants in KSA is low as the mean total score was 11.9 ± 3.0 out of nineteen with the highest knowledge areas displayed in domain 1 of the questionnaire concerning impairments in the area of social interaction. This finding is consistent with the findings of Hend (2017) study which found

that knowledge about ASD among family Physicians in Egypt was low with a total mean score (11.2 ± 3.5) and that the highest score in knowledge was in domain one. This similarities in findings between the two studies could be attributed to the fact that the sample in both studies consisted of medical consultants and that the two countries of Egypt and KSA are neighbors in the Middle East. The low level of knowledge of ASD in this study could also be related to what all the participants indicated as their lack of any previous formal training identified for ASD.

Studies that were conducted in KSA have found ASD knowledge to be lower among their sample than the sample in this study (Hayat et al., 2019; Helmy, 2017). This could be attributed to the differences between their samples and this study's sample as Hayat et al. (2019) study did include all medical staff (physicians and non-physicians), and Helmy (2017) study included medical student who did not graduate yet from medical school. Therefore, it could not be assumed that ASD knowledge among medical consultants in this study were to be similar to the different samples in other studies. Igwe et al. (2010) total mean score was also lower than this study 10.67 ± 3.73 , which could be attributed to their sample being only from medical students. On the other hand, findings from Esegbe et al. (2015) study displayed a good knowledge of ASD among medical doctors in Nigeria that was higher than ASD knowledge in this study' sample. This might be because Esegbe et al. (2015) high ASD knowledge was identified among pediatricians and psychiatrists who are supposed to be knowledgeable about ASD as they deal with the different disorders in children.

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The second finding of this study was that years of practice as consultants were discovered to be non-significantly correlating with ASD knowledge among consultants. This is consistent with the findings of Rohanachandra et al. (2017) study which discovered that ASD knowledge did not differ significantly with years of experience. However, this study found ASD knowledge among medical consultants to be significantly correlating with years of practice for consultants of five years and more for domain one in the KCAHW. This could be because participants in this study did display high knowledge of ASD in domain one of the KCAHW compared other domains.

The third finding of this study was that the level of ASD knowledge among medical consultants in KSA was significantly affected by subspecialties in all the domains of KCAHW. Medicine, endocrinology and obstetrics had significantly higher ASD knowledge greater than the other subspecialties for consultants. However, surgeons were found to be significantly the least knowledgeable about ASD among other specialties which could be attributed to the probability that surgeons were usually not exposed to children with ASD or their parents compared to other subspecialties. This finding is considered to be unique to this study as no previous study had attempted to look for differences in significance in ASD knowledge among consultants. Therefore, future studies should attempt to discover differences in ASD knowledge based on subspecialties for medical consultants in different parts of the world.

Limitation:

One of the limitations of this study was that it was carried out at a university hospital in Jeddah in which ASD knowledge of consultants might not reflect that in other hospitals at KSA. However, this hospital is the largest educational hospital in the city in which many medical residents and students are doing their medical training which was thought to be a suitable place to collect data from for the purpose of this study. Another limitation was the small sample size which reflects a low response rate in a questionnaire-based study. However, all efforts has been made to encourage medical consultants to participate in order to improve the response rate by sending two reminders to all consultants in different subspecialties. As the study was an online anonymous survey, non-participants could not be traced directly. This could be due to the fact that medical consultants at this hospital were also teaching staff at the university with multi task responsibilities and busy schedules that might have prevented them from participating in this study. It is recommend that future studies explore greater sample size of medical consultants and in different hospitals across the country.

Conclusion:

There is a lack of ASD knowledge among medical consultants in KSA, so they need more formal training on ASD to increase their level of knowledge to improve early detection and provision of intervention so as to improve the quality of life and care of children with ASD and their families. Moreover, more research is needed to evaluate

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factors associated with low ASD knowledge among medical consultants to help address those factors in medical curriculum and advanced continues professional training programs.

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