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Research Article

Awareness of Autism Spectrum Disorder among Medical Students of Qassim University, Saudi Arabia

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Abstract

Introduction: Autism Spectrum Disorders (ASDs) are neurodevelopmental conditions that are complicated, prevalent and having or stemming from a number of different causes or influences. Perception of deviant conduct shapes the diagnostic foundation, with standards focused on deficiencies in social correspondence and interaction, and limited, repetitive patterns of conduct, interests, or exercises.

Aim: This study aims to assess the awareness of Autism spectrum disorder among 4th and 5th year medical students at Qassim University and to improve early recognition, referral, diagnosis and management of autism.

Materials and Methods: This is a cross-sectional study conducted in Qassim University, College of Medicine for both male and female branches. Using validated self-administered questionnaires conducted among 4th and 5th year medical students of Qassim University, students were recruited using a convenience sampling method from both genders. The questionnaire was designed to examine the demographics, educational experience and specialty interests. Specific awareness questions about Autism spectrum disorder were included to examine their knowledge about the disorder. All statistical analyses were carried out using SPSS version 21.

Results: The mean knowledge score was 10.4 (SD 4.39) out of 19 with good knowledge were found to 55.6% of students while 44.4% were classified as poor knowledge. With regards to correct beliefs towards autism, the mean score was 3.06 (SD 1.41) out of 7, where inadequate and adequate belief had been found to 61.8% and 38.2% respectively. For the attitude, the mean score was 3.97 (SD 0.75) out of 5, where positive and negative attitude were observed to 83.1% and 16.9% respectively. A highly positive significant correlation had been observed between knowledge, belief and attitude score. Being a female, being a 5th year level, being medicine preferred specialty and being completed or still in psychiatric block are the factors being associated with higher mean knowledge and belief score while completed or still in pediatric block was the factor being associated with having higher mean score on knowledge, belief and attitude.

Conclusion: Although the knowledge of medical students regarding ASD was found to be moderate and many of them had positive attitude however, most of them had misconception regarding ASD. 5th year medical students are deemed better in knowledge, belief and attitude compared to 4th year level.

Keywords: *ASD; Awareness; Knowledge; Belief; Attitude; Medical Students*

Introduction

Autism spectrum illnesses (ASDs) are neurodevelopmental conditions that are complicated, prevalent and having or stemming from a number of different causes or influences. Perception of deviant conduct shapes the diagnostic foundation, with standards focused on deficiencies in social correspondence and interaction, and limited, repetitive patterns of conduct, interests, or exercises [1]. In 1943, Leo Kanner, an American psychiatrist, used the word "early childhood autism" to define kids without interest for other individuals [2]. An Austrian pediatrician, Hans Asperger, autonomously portrayed another group of kids with comparable behaviors separately in 1944, but with lower severity and greater intellectual capacity. From that point forward, his name has been connected to the Asperger syndrome, a greater functioning form of autism [3]. The word "pervasive developmental disorders" was first utilized only in the 1980s.

Autism is more appropriate to be called Autism Spectrum Disorder (ASD) as it depicts a variety of complicated neurodevelopmental circumstances. This disorder is portrayed by debilitated social collaboration, verbal and non-verbal correspondence, limited interest, and repetitive conduct [4]. Autism symptoms are extremely heterogeneous ranging from serious deficiency to slight delay [5]. The condition is typically diagnosed at 3 years of age and is more prevalent in men than women, in a proportion of 4:1 [6].

Latest proof that the incidence of analyzed ASD may increase and that early conclusion and intermediation are likely connected with better long-term results has made it essential for medical learners should build their reserve of learning in regards to the disorder [7,8].

A researcher in Taif, Saudi Arabia "evaluated the learning and attitude of medical learners in regards to ASD". The study included all second- and sixth-year students present at the time of data collection were incorporated into the investigation. When comparing the understanding and attitude of second (Group A) and sixth-year medical learners (Group B), it was discovered that Group B's knowledge and attitude rating was measurably huge higher than Group A. Remarkably, most learners in both groups indicated that ASD children should not be incorporated in fundamental school stream [9].

It was revealed in Malaysia that the recognition of ASD medical learners in the clinical year was lesser as such that only 2.9 percent of learners had precise beliefs and 1.4 percent of learners had sufficient understanding of ASD. In addition, 85.7 percent of learners who consider the autistic person as an ordinary person, which to state that there were still nearness of 14.3% who consider them to be unusual. This demonstrates, therefore, that there was still some level of stigma or discrimination that took place. In their own conclusion, acceptance and approaches concerning autistics can be developed so that medical learners would be commendable to people on how autistics ought to be dealt with [4].

The learning and acknowledgment of manifestations of ASD in Nigeria was seen to be better among medical learners in the final year. They likewise revealed that the learning about ASD differs crosswise over sexual orientation and locales though misguided judgments about ASD were additionally seen among medical learners in the final year [10].

Study results on awareness in Zambia uncovered a high extent of learners by seventy-nine percent (79 percent) had never known about ASD. Gender, having kids, internet use, and study school have described significant variability in dimensions of ASD understanding.

They further presumed that the effects of low ASD awareness and knowledge is an invitation to put resources into ASD awareness campaigns through diverse platforms so as to advance ASD learning that converts into expanded ASD understanding for better administration arrangement in Zambia [11].

Medical students are generally dispatched in Pediatrics and Psychiatry during their research, which are the two specialties where they can learn about neurodevelopmental disorders of the adolescence in general and explicitly about ASD. This research thus measures knowledge among Qassim University, Saudi Arabia medical learners of autism spectrum disorder. Because the disease lacks conscious-

ness and understanding, there may be interruption in offering intervention to those impacted as this may worsen their situation. Therefore, before they begin their practice in hospital or clinical environments, there is a requisite to increase the understanding and knowledge of ASD among medical students.

Objectives of the Study

General Objectives

This study aims to assess the awareness of Autism spectrum disorder among 4th and 5th year medical students at Qassim University and to improve early recognition, referral, diagnosis and management of autism.

Specific objectives

- To assess knowledge about definition of Autism spectrum disorder.
- To assess knowledge about symptoms of Autism spectrum disorder.
- To assess knowledge about diagnosis of Autism spectrum disorder.
- To assess knowledge about appropriate management approach of Autism spectrum disorder.
- To identify and improve the medical students knowledge-gaps in regards to general awareness about Autism spectrum disorder.

Methods

Research design

For this cross-sectional study, the convenience sample consisted of fourth to fifth-year medical students from the male and female branches of Qassim University College of Medicine. The sample completed previously validated self-administered questionnaires. Qassim University was established in 2004 by merging the two Qassim branches of Imam Mohammad Ibn Saud Islamic University and King Saud University. The College of Medicine has a problem-based learning system. It admits approximately 120 students each year, with approximately 450 forming the entire student body. The study protocol was approved by Subcommittee of Health Research Ethics, Deanship of Scientific Research, Qassim University.

Sample and sampling technique

This study was conducted using a convenience sample consisting of male and female fourth to fifth-year medical students from Qassim University College of Medicine. The required sample size was not computed, as it was the intention to include all students from the two grade levels.

Data collection

Data were collected with a validated self-administered questionnaire [4] that assessed demographics, educational experience, preferred specialization, and awareness of autism. Their knowledge of autism was assessed with items that required them to identify features of autism based on the different resources. One of the researchers assisted the students and collected questionnaires immediately upon completion. This was done to avoid discussion of the study material during distribution and completion of the questionnaires.

Statistical analyses

Descriptive Statistics were presented using counts, proportions (%), mean ± standard deviation as appropriate. Between-group comparisons were made using Mann Whitney U test (2 categories) and Kruskal Wallis Test (3 or more categories) for mixed variables, whenever appropriate. Correlation (Pearson-R) procedures were also conducted for the comparison between the mean score of the three predictors (knowledge, belief and attitude). All statistical tests are two-sided and p value < 0.05 is considered statistically significant. Normally test has been conducted using Kolmogorov-Smirnov and Shapiro-Wilk test, $p < 0.05$ were considered skewed data. All data analyses had been carried out using Statistical Packages for Software Sciences (SPSS) version 21 (SPSS, Chicago, IL, USA).

The evaluation of knowledge toward autism which comprised of 19 questions where the correct answer had been presented and coded as 1. The total knowledge score had been calculated by adding up the 19 questions and a possible score range from 1 - 19 had been generated. By using the cutoff points of 60% of the total score, students were classified as having poor knowledge if the knowledge score was from 1 - 10 whereas students were classified as having good knowledge if the knowledge score was from 11 - 19.

The assessment of belief toward autism which comprised of 7 questions where the correct answer had been presented and coded as 1. The total belief score had been calculated by adding up the 7 questions, a possible score range from 0 - 7 had been generated. By using the cutoff points of 60% of the total score, students were classified as having inadequate belief if score was from 0 - 3 whereas students were classified as having adequate belief if score was from 4 - 7.

The measurement of attitude toward autism which comprised of 5 questions where the correct answer had been presented and coded as 1. The total attitude score had been calculated by adding up the 5 questions, a possible score ranges from 1- 5 was obtained. By using the cutoff points of 60% of the total score, students were classified as having negative attitude if the attitude score was from 1 - 3 whereas students were classified as having positive attitude if attitude score was from 4 - 5.

Results

We invited 178 students from Qassim University to participate in this study. The details of the descriptive statistics, frequencies and percentages relating to the student's socio demographics characteristics has been presented at table 1. The age range of students was from 21 to 30 years old (mean 25.3) with more than a half (57.3%) were in the 23 - 24 years old group. Males dominated the females (68% vs 32%) with nearly all students were single (94.9%) and without children (97.8%). Around 60 percent of them were in the 5th year level but mostly were not completed pediatric block (75.3%) and psychiatric block (64.6%). Of the 178 students, only 15 students had a family history of behavioral disorder with autism (4 cases) and intellectual disability (4 cases) were the most commonly known behavioral disorder.

Study Variables	N (%)
Age group	
21 - 22 years	44 (24.7%)
23 - 24 years	102 (57.3%)
>24 years	32 (18.0%)
Gender	
Male	121 (68.0%)
Female	57 (32.0%)
Marital Status	
Married	09 (05.1%)
Single	169 (94.9%)

Having children	
Yes	04 (02.2%)
No	174 (97.8%)
Academic year level	
4th year	71 (39.9%)
5th year	107 (60.1%)
Completed pediatric block	
Yes	40 (22.5%)
No	134 (75.3%)
Still in block	04 (02.2%)
Completed psychiatric block	
Yes	42 (23.6%)
No	115 (64.6%)
Still in block	21 (11.8%)
History of behavioral disorder	
Yes	15 (08.4%)
No	163 (91.6%)
Type of behavioral disorder*	
ADHD	02 (13.3%)
Autism	04 (26.7%)
Intellectual disability	04 (26.7%)
Others	05 (33.3%)

Table 1: *Students Socio Demographic Characteristics (n = 178).*

**:Only those with history of behavioral disorder are included in the analysis.*

Figure 1 showed the distribution of specialty as preferred by the students. It was revealed that the most common specialty being chosen was surgery (19.7%), followed by psychiatry (12.9%) and medicine (12.9%).

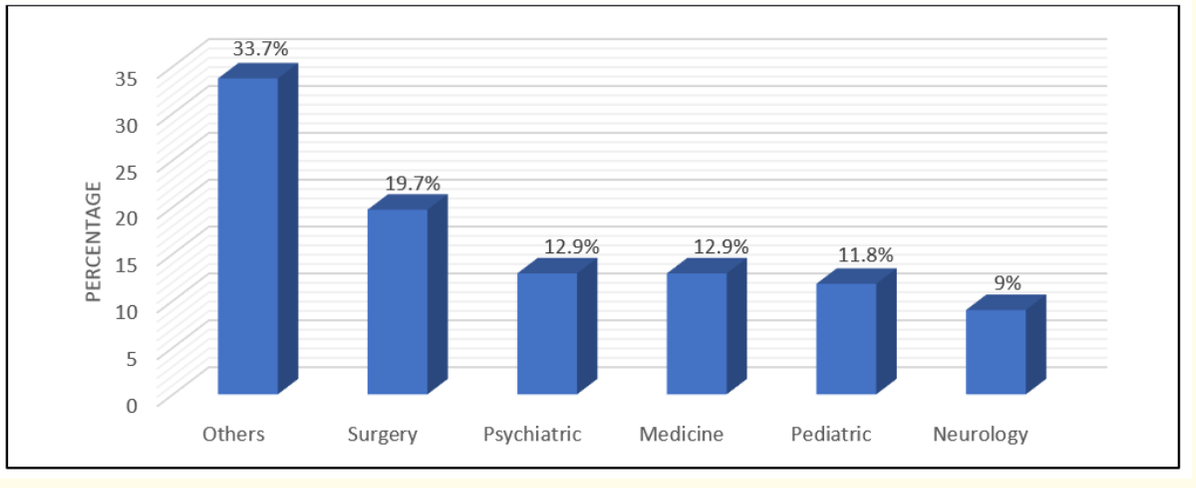

Figure 1: *Distribution of preferred specialty.*

Table 2 provided the determinants of belief toward autism. Based on the results, 47.2% of the students correctly identified that autism is an emotional disorder. We also observed that most of the students (79.2%) have known that vaccines can cause autism in children. However, only 30.9% of the students believe that males are more frequently diagnosed with autism compared to females and only 16.3% believe that children with autism can grow up to live independently. There were not so many of them (36%) believe that autism can be cured while also a relatively few believe that proper treatment of autism, children can eventually outgrow it. Additionally, nearly all of them (80.9%) consider special education services are essential for autistic children.

Statement	Correct Answer N (%)
Autism is an emotional disorder	84 (47.2%)
Vaccines can cause autism in children	141 (79.2%)
Males is more frequently diagnosed with autism compare to females	55 (30.9%)
Children with autism can grow up to live independently	29 (16.3%)
Autism can be cured	64 (36.0%)
With the proper treatment, most children with autism will eventually outgrow it	28 (15.7%)
It is essential for autistic children to receive special education services	144 (80.9%)

Table 2: *Determinants of beliefs toward autism (n = 178).*

In the statement of determinants of attitude toward autism shown in table 3, many of them (87.1%) exemplified positive attitude with regards to the statement about "Are you willing to move next to an individual with ASD?" We also observed that nearly all students (94.9%) showed positive attitude regarding the statement about "Willingness to stays remain in the seat even autistic person sits next in the bus." On the other hand, negative attitude had shown regarding the statement about "Seeing autistic individual as normal individuals." Similarly, nearly all students exhibited positive attitude with regards to the statements about "feeling frightened even an autistic person shares the same room" and "Autism is the fault of the person who has it" with 90.4% and 91.6% showing positive attitude respectively.

Statement	Correct Answer N (%)
Willing to move next door to an individual with ASD	155 (87.1%)
Willing to stays remain in the seat even autistic person sits next in the bus	169 (94.9%)
Seeing autistic individuals as normal individuals	59 (33.1%)
Feeling frightened even an autistic person shares the same classroom	161 (90.4%)
Autism is the fault of the person who has it	163 (91.6%)

Table 3: *Determinants of attitude toward autism (n = 178).*

The determinants of knowledge toward autism has been described at table 4 which was composed of 19 statements. Among the 19 statements, students exhibited good knowledge with regards to the statements about "Marked impairment in use of multiple non-verbal behaviours such as eye to eye contact, facial expression, body postures and gestures during social interaction" and "Onset of Autism is usually in childhood period." On the other hand, students rated poor knowledge on the following statements such as: "Maybe associated with abnormal eating habit", "Autism is a neuro-developmental disorder", "Autism could be associated with mental retardation" and "Autism could be associated with epilepsy." The rest of the knowledge statements were considered as moderate knowledge with a rated range from 50% - 70% as seen in table 4.

Statement	Correct Answer N (%)
Marked impairment in use of multiple non-verbal behaviours such as eye to eye contact, facial expression, body postures and gestures during social interaction	127 (71.3%)
Failure to develop peer relationship appropriate for developmental age	124 (69.7%)
Increased will to share enjoyment, interest or activities with other people	94 (52.8%)
Lack of social or emotional feedback	118 (66.3%)
Staring into open space and not focusing on anything specific	92 (51.7%)
The child can appear as if deaf or dumb	94 (52.8%)
Loss of interest in the environment and surroundings	123 (69.1%)
Social smile is usually absent in a child with autism	114 (64.0%)
Delay or total lack of development of spoken language	114 (64.0%)
Stereotyped and repetitive movement (e.g. Hand or finger flapping or twisting)	106 (59.6%)
May be associated with abnormal eating habit	45 (25.3%)
Persistent obsession with parts of objects	106 (59.6%)
Love for regimented routine activities	95 (53.4%)
Autism is childhood schizophrenia	93 (52.2%)
Autism is an auto-immune condition	102 (57.3%)
Autism is a neuro-developmental disorder	72 (40.4%)
Autism could be associated with mental retardation	63 (35.4%)
Autism could be associated with epilepsy	34 (19.1%)
Onset of Autism is usually in childhood period	144 (80.9%)

Table 4: *Determinants of knowledge toward autism (n = 178).*

Table 5 described the prevalence of knowledge, beliefs and attitude toward autism. Based on the results, the mean knowledge score was 10.4 (SD 4.39). Among them, 55.6% were classified as having good knowledge while 44.4% were classified as having poor knowledge. With regards to belief, the mean score was 3.06 (SD 1.41) with 61.8% of them were classified as having inadequate belief while 38.2% were classified as having adequate belief. For the attitude, the mean score was 3.97 (SD 0.75) with nearly all of them (83.1%) were classified as having positive attitude whereas 16.9% of them were classified as having negative attitude.

Parameters	N (%)
Knowledge Score (mean ± SD)	10.4 ± 4.39
Level of knowledge	
Poor	79 (44.4%)
Good	99 (55.6%)
Belief Score (mean ± SD)	3.06 ± 1.41
Level of belief	
Inadequate	110 (61.8%)
Adequate	68 (38.2%)
Attitude Score (mean ± SD)	3.97 ± 0.75
Level of attitude	
Negative	30 (16.9%)
Positive	148 (83.1%)

Table 5: *Prevalence of knowledge, beliefs and attitude toward Autism (n = 178).*

Figure 2 showed the correlation between knowledge score and belief score. It was observed that a highly positive significant correlation has been detected between knowledge score and belief score (r = 0.461, p- < 0.001).

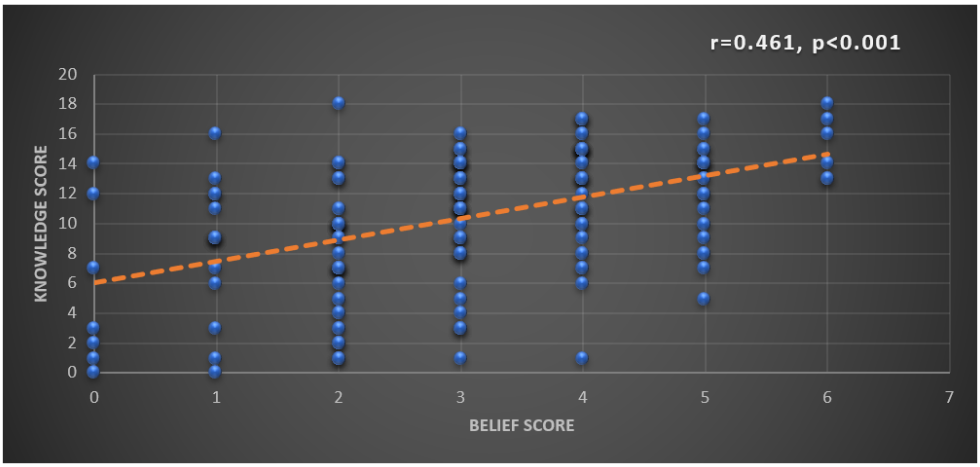

Figure 2: *Correlation between knowledge score and belief score.*

Figure 3 depicted the correlation between knowledge score and attitude score. It was revealed that the correlation was highly statistically significant (r = 0.269, p- < 0.001).

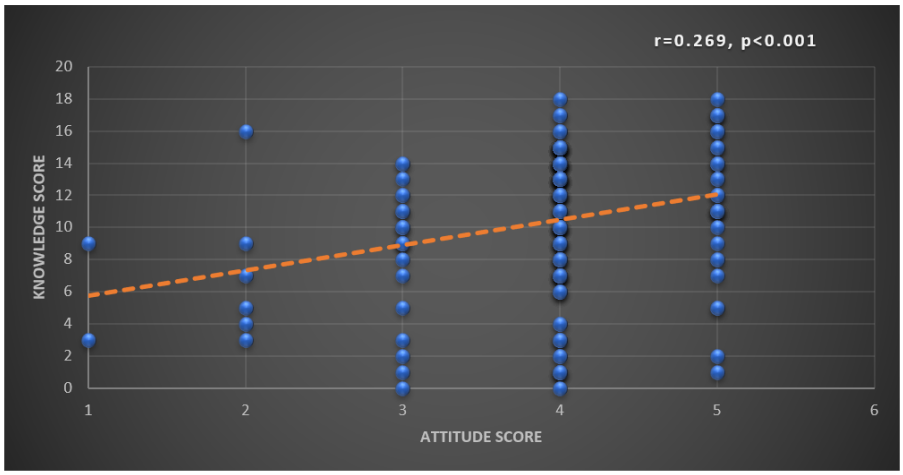

Figure 3: *Correlation between knowledge score and attitude score.*

With regards to the correlation between belief score and attitude, we found the correlation was positively significant between belief score and attitude score (r = 0.231, p- < 0.001) (Figure 4).

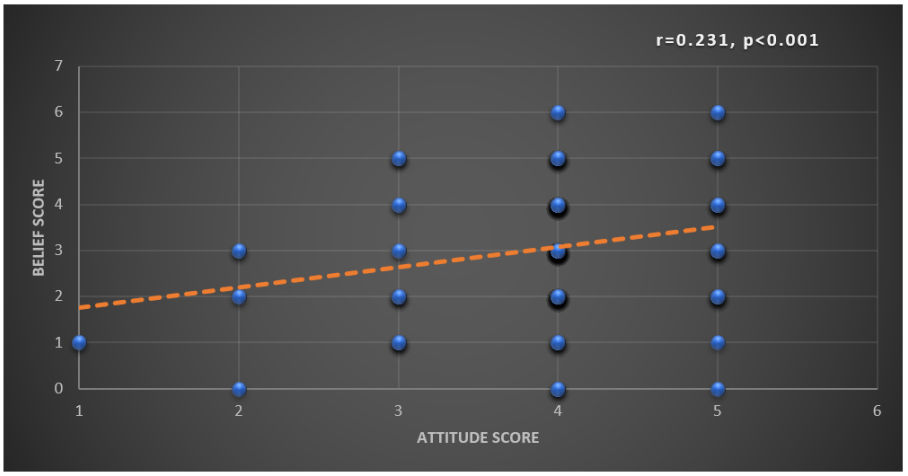

Figure 4: *Correlation between belief score and attitude score.*

When comparing the knowledge, belief and attitude score among the socio demographic characteristics of students, we found that those students with more than 24 years have significantly better knowledge score (p-0.004). Males are significantly higher of having knowledge (p- < 0.001) and belief score (p-0.001). We also observed 5th year level students are significantly better of having knowledge (p- < 0.001) and belief score (p-0.006) while those students with medicine preferred specialty are significantly more of having knowledge (p-0.008) and belief score (p-0.020). Similarly, those students who completed or still in pediatric block are significantly better in knowledge (p- < 0.001) belief (p- < 0.001) and attitude (p-0.005) while those students who completed or still psychiatric block are significantly more associated with having better knowledge (p- < 0.001) and belief (p- < 0.001). On the other hand, variables such as; marital status, having children, and history of behavioral disorder did not differ significantly among knowledge, belief and attitude as seen in table 6.

Factor	Knowledge Total score (19) Mean ± SD	Belief Total Score (7) Mean ± SD	Attitude Total Score (5) Mean ± SD
Age group[a]			
21 - 22 years	9.57 ± 3.97	2.66 ± 1.33	3.93 ± 0.87
23 - 24 years	10.2 ± 4.54	3.16 ± 1.44	3.97 ± 0.64
>24 years	12.4 ± 3.99	3.31 ± 1.38	4.03 ± 0.89
F = test; P-value	F = 4.249; p-0.004**	F = 2.559; p-0.060	F = 0.163; p-0.624
Gender[b]			
Male	11.3 ± 4.29	3.29 ± 1.47	3.99 ± 0.77
Female	8.72 ± 4.11	2.58 ± 1.16	3.93 ± 0.70
T = test; P-value	T = 3.740; p-<0.001**	T = 3.206; p-0.001**	T = 0.515; p-0.489
Marital Status[b]			
Married	11.8 ± 4.49	3.11 ± 1.62	4.11 ± 0.60
Single	10.4 ± 4.39	3.06 ± 1.41	3.96 ± 0.76
T = test; P-value	T = 0.931; p-0.223	T = 0.107; p-0.789	T = 0.572; p-0.653

Having children[b]			
Yes	9.50 ± 6.56	3.25 ± 1.50	4.25 ± 0.50
No	10.5 ± 4.35	3.06 ± 1.42	3.97 ± 0.75
T = Test; P-value	T = -0.437; p-0.945	T = 0.268; p-0.849	T = 0.752; p-0.464
Academic year level[b]			
4th year	8.59 ± 3.85	2.70 ± 1.39	3.89 ± 0.80
5th year	11.7 ± 4.31	3.29 ± 1.38	4.03 ± 0.71
T = Test; P-value	T = -4.889; p-<0.001**	T = -2.799; p-0.006**	T = -1.232; p-0.285
Preferred Specialty[a]			
Pediatric	11.6 ± 3.92	2.67 ± 1.06	4.14 ± 0.65
Psychiatric	11.4 ± 4.32	3.35 ± 1.47	4.09 ± 0.67
Neurology	8.81 ± 5.15	3.19 ± 1.60	4.00 ± 0.89
Surgery	10.8 ± 4.05	3.11 ± 1.35	3.83 ± 0.89
Medicine	12.3 ± 4.33	3.87 ± 1.14	3.91 ± 0.61
Others	9.22 ± 4.24	2.72 ± 1.47	4.13 ± 0.55
F = Test; P-value	F = 2.891; p-0.008**	F = 2.913; p-0.020**	F = 0.994; p-0.537
Completed pediatric block[b]			
Yes/Still in block	13.4 ± 3.68	3.77 ± 1.16	4.23 ± 0.64
No	9.49 ± 4.18	2.83 ± 1.42	3.89 ± 0.76
T = Test; P-value	T = 5.526; p<0.001**	T = 4.001; p-<0.001**	T = 2.657; p-0.005**
Completed psychiatric block[b]			
Yes/Still in block	12.4 ± 4.07	3.60 ± 1.28	4.09 ± 0.64
No	9.39 ± 4.21	2.77 ± 1.40	3.90 ± 0.79
T = Test; P-value	T = 4.585; p-<0.001**	T = 3.930; p-<0.001**	T = 1.637; p-0.157
History of behavioral disorder[b]			
Yes	10.9 ± 3.83	3.33 ± 1.23	4.13 ± 0.35
No	10.4 ± 4.45	3.04 ± 1.43	3.96 ± 0.77
T = Test; P-value	T = 0.445; p-0.739	T = 0.776; p-0.419	T = 0.874; p-0.500

Table 6: *Comparison between knowledge, belief and attitude among the socio demographic characteristics of students (n = 178).*

[a]: P-value has been calculated Kruskal Wallis Test.

[b]: P-value has been calculated using Mann Whitney U test

***: Significant p < 0.05.*

Discussion

The awareness of the medical students regarding ASD has been evaluated in this study. The discussion of this topic was very limited here in Saudi Arabia specifically with regards to the knowledge of medical students, except for the study published by Helmy which was conducted in Taif Medical College students [9]. In this study, the mean score of knowledge regarding ASD was 10.4 ± 4.39 out of 19 where 55.6% of the medical students has been accounted as having good knowledge while poor knowledge were known to 44.4%. We further observed that the knowledge score of those medical students in 5th year level are significantly higher compared to 4th year level (11.7 ±

4.31 and 8.59 ± 3.85, p- < 0.001). These results are consistent from the study published by Helmy [9]. The study was about the "Knowledge and attitude concerning Autism Spectrum Disorder (ASD) among Taif Medical College students, Kingdom of Saudi Arabia." Among 243 medical students (2nd year: 163 students, 6th year: 84 students), the mean score of 6th year in knowledge was 8.59 ± 3.85 out of 17 while 2nd year it was 6.44 ± 2.24 which was statistically significant among the group. In India [12] researchers compared the mean knowledge score between para-clinical and pre-clinical students, it was observed that para-clinical had shown better knowledge score compared to pre-clinical, 7.30 ± 3.0 vs 5.91 ± 2.90 respectively which was a significantly increased ($p < 0.05$). However, in Malaysia the mean knowledge score of medical students was slightly higher than our report which showed 12.93 ± 3.56 out of 19 [4]. They also documented that only 1.4% of students out of 210 were found to have an inadequate knowledge toward ASD. In Nigeria, Igwe., *et al*. [13] found that the overall mean knowledge score was 10.67 ± 3 which was coincided with our study finding, although the total score was 16 points whereas in our study it was 19. Furthermore, they also compared the mean knowledge score between medicine, nursing and psychology students. They accounted that the mean knowledge of medical, nursing and psychology students were, 12.24 ± 3.24, 10.76 ± 3.50 and 9.01 ± 3.76 respectively which was significantly higher among the medical students group. However, in Pakistan [14] the total mean score of medical students showed 12.3 ± 4.71 where 53.5% students had knowledge above the mean score and 46.6% had lower scores which was also consistent with our study result. They also evaluated the mean knowledge score between private and public university students which revealed mean score of private medical students was 12.0 ± 4.69 while mean score of public students was 12.1 ± 4.76 however, these results were not statistically significant among the group. On the other notes, Lüleci., *et al*. [15] assessed the awareness of first grade nursing and medical students in Marmara University, Istanbul, Turkey. They documented that a relatively great proportion of the students (78.9%) were aware of autism whereas in France [16] more than 85% of responders rated their general knowledge of ASD to be less than somewhat informed which was not consistent with our report.

A paper in similar approach published by Marzo., *et al*. [4] reported that the mean score of belief was 3.84 ± 3.56 out of 7 which suggested that most of the clinical year medical students had misconception about autism as there was a deficiency of experience on autism and hence lead to a limited awareness. In our study, the mean score of belief was 3.06 ± 1.41 out 7 where 61.8% of the medical students were having inadequate belief versus 38.2% of adequate belief which was in agreement from the study published by Marzo., *et al* [4]. Additionally, we found 5th year students had significantly higher of having mean belief score as opposed to 4th year level (3.29 ± 1.38 vs 2.70 ± 1.39, p-0.006).

A similar study also reported that the mean attitude score of 6th year level was significantly better compared to 2nd year level 3.92 ± 0.97 vs 3.29 ± 1.33 respectively [9]. These results are comparable with our study outcome where the overall mean attitude score was 3.97 ± 0.75 out of 5 with positive attitude has been observed to 83.1% while negative attitude has been observed to 16.9% of the medical students. Although our results did not differ significantly between 4th year and 5th year level (3.89 ± 0.80 vs 4.03 ± 0.71) which gives distinction from the latter study since they observed a significant difference between attitude and the academic year level.

When we measured the correlation between the mean score of knowledge, belief and attitude we found a significant and positive correlation among each predictor and the strong correlation were reflected between the knowledge ad belief score ($r = 461$, p- < 0.001). In a study published by Helmy [9] he observed a strong correlation from overall knowledge and attitude score which was also in line with our study outcome.

In this study, we identified some of the factors being associated with knowledge and belief toward ASD among them were; gender, academic year level, preferred specialty and completed or still in psychiatric block while completed or still in pediatric block was the factor being associated with knowledge, belief and attitude whereas group in years was the lone factor being associated with knowledge. Factors associated with knowledge, belief and attitude had also been determined in a study published by Marzo., *et al* [4]. They documented that no significant difference between belief among gender, ethnicity, and type of institution but it was significant among educational level.

They also reported statistically significant difference between knowledge among the type of institution and educational level but no difference on ethnicity. Moreover, insignificant associations were found between the gender, ethnicity and type of education with attitude but educational level has significant association to attitude. In Turkey [15] they observed a significant difference found between awareness level and gender while in France [16] pediatric trainees were significantly had better knowledge compared to medical students.

Limitations of the Study

This study has limitations. Firstly, due to the use of self-reported questionnaires, which entail self-report bias, the generalizability of the overall findings is limited. Secondly, due to the cross-sectional design of the study, nonresponses may have biased the emergent results. And lastly, the study only represents one university.

Conclusion

Although the knowledge of medical students regarding ASD was found to be moderate and many of them had positive attitude however, most of them had misconception regarding ASD. 5th year medical students are deemed better in knowledge, belief and attitude compared to 4th year level. Completion or still in pediatric block was the factor being associated with knowledge, belief and attitude while gender, academic year level, preferred specialty and completion or still in psychiatric block are the factors being associated to both knowledge and belief. More investigations are needed in order to validate the knowledge, belief and attitude of medical students regarding ASD in our region.

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Conflicts of Interest

There are no conflicts of interest.

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