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Assessment of The Knowledge of Pediatric Nurses in Childhood Autism In Riyadh, KSA using KCAHW Questionnaire

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Abstract
Background: *Autism is a global disorder which is markedly increasing in recent decades, so researchers speak of "epidemic outbreak" of the disease. Although the diagnostic framework has been expanded and more disorders now fall within the autistic spectrum still no one disputes the increased incidence of autism in modern societies, thus making it a major global public health problem.Poor knowledge about childhood autism among paediatric nurses who are members of multidisciplinary teams who care for these children may be a major barrier to early interventions that could perhaps improve theirquality of life and prognosis. Moreover, several factors that influence knowledge about childhood autism among these nurses are up till now must be fully ascertained.*
Objectives: *This study assessedthe knowledge of paediatric nurses in Riyadh, KSA (Kingdom of Saudi Arabia) on childhood autism. The study also determined the differences in knowledge with the socio-demographic and experience profile of the samples. Moreover, knowledge difference between nurses exposed and those not exposed to autism disorder was also explored.*
Methods: *A total of 125 pediatric nurses participatedas samples from all inpatient pediatric units in King Faisal Specialist Hospital and Research Center (KFSHRC) in Riyadh KSA. A Knowledge of Childhood Autism among Healthcare Workers (KCAHW) questionnaire with socio-demographic profile was utilized in the data gathering process.*
Results: *Findings revealed that the overall knowledge score among pediatric nursesabout childhood autism was (11.11± 3.82) which is regarded as good. The mean scores for Domain (1),(2),(3), and (4)were (6.07±2.20), (0.68 ±0.47), (2.58 ±1.30), (1.78 ±1.02) respectively.Furthermore, there are no significant differences on the knowledge in childhood autism with age, nationality, educational level, experience in KSA, experience in current position, and current working area ($p > 0.05$). However, there is a significant differenceon the overall knowledge in relation to gender and those pediatric nurses with experiences, either frequent or sporadic, caring for autistic children than those without exposure($p < 0.05$).*
Conclusion: *The study reveals that there are insufficienciesin the pediatric nurses' knowledge about childhood autism of those who are not exposed to this cases. Pediatric nurses, as members of multidisciplinary teams who care for children with autism, are expected to provide holistic care and adequate counseling to the families of these children. Their theoretical foundations when combined with experiential learning in their clinical practice can advance the knowledge of pediatric nurses on the early detection and management of autism in children.*
Recommendation*: Continuing nursing education and exposure is highly recommendedamongpediatric nurses is therefore essential which may be accomplished through postgraduate education, seminars and workshops and trainings in the actual settings. These activities will enhance pediatric nurses' knowledge and concurrently their skills on the early detection and appropriate nursing management for childhood autism.*
Keywords: *Autistic Disorder, knowledge, pediatric nurses, childhood autism*

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I. Background

Nursing is the nation's largest health care profession with more than 3.1 million registered nurses nationwide (Health Resources and Services Administration, 2010); hence, nursesplay an essential and critical role in the early detection of the behavioral characteristics such as that in autistic children (Bakare et al., 2008). The concept on Maternal and Child Health has been imparted to these nurses during their college years and part of which is pediatric nursing. Nursing students have attended several lectures in nursing care management for children with disorders as part of their pre-requisites to complete the nursing course. Even if nurses do not have

an experience in handling actual patients with autism, the theoretical knowledge which they gained in their college years gave them the opportunity to learn the fundamentals of caring in individuals across life span and illnesses such as special children with autism. Aside from nursing schools, there may be several sources of information such as in social media, print-ads and even the sharing of learning experiences from co-nurses. Even though nurses are not regularly exposed to autistic children, nurses may have gained knowledge through the influence of the environment surrounding them.Autism spectrum disorder (ASD) is a neurodevelopmental disordermarked by the existence of impairment in social communication and restricted repetitive behaviors (American Psychiatric Association (APA), 2013). While several evidences suggested that ASD can be a hereditary disorder (Glessner, et al., 2009), recent large-scale studies have shown that the presence of ASD related genes also account for 10-20% of the total cases (Abrahams and Geschwind, 2008). Hence, the justification of its occurrence has shifted to understandingthe environmental factors which can contribute to the emergence of ASD in certain cases (Berg, 2009).Researchers questioned whether autism was a universal phenomenon. Some of scientists believed that the autism was a condition limited to Western and technologically developed nations. Nowadays, there are evidences of increased prevalence of and knowledge about ASD cross-culturally and in the international arena (Bakare and Munir, 2011).

According to Pinto-Martin et al. (2008), high percentage from children with ASD remain undiagnosed until the time they reach school age. The delay reveals that the family members lack the knowledge and skills in assessing the child manifesting signs and symptoms of autism which could alsodelaythe needed specialized care that they require. Hence, better prognosis for ASD can be achieved through awareness of the disorder to succeed in the early detection, early recognition and diagnosis.

A study by Igwe et al. (2011), in Nigeria, determined that the major barrier to timely intervention and prognosis in ASD children is poor knowledge among pediatric nurses. Therefore, nurses must be trained to manage this disorder necessarily. Meanwhile, Bramsfeld et al. (2017), showed that one of the sources of information about ASD are the health care workers which play a vital role developing health education programs which ehances the awareness of the parent on autism. Although the prevalence of ASD continues to increase, minimal researches has been published exploring the role of the nurses in the identification, intervention, and educational health needs of children with ASD (Clarke, 2015). In lieu with this, the studyaimed to explore thepediatric nurses' knowledge on childhood autism of in-patient areas at tertiary care hospitals. The study also aimsto examine the differences between their socio-demographic and exposure towards knowledge about autism in children.Discovering the knowledge status of the pediatric nurses on autism, will help the hospital administration in prioritizing the training needs and any corrective actionsspecifically to their staff nurses may it be in the hospitals or academic institutions.The findings of this study might give a feedback to nurses on ASD children by exploring the gaps in knowledge about the disorder and to evoke the awareness about the specific needs for autistic children which could be a major obstacle in treating and caring for such children.A couple of research questions were formulated toanswer in this study which include: (1) What is the status of the pediatric nurses onknowledge in childhood autism? (2) Are there any significant differences between socio-demographic dataand the knowledge status inchildhood autism? (3) Are there any significant differences between pediatric nurses exposed to autistic children with those not exposed based on the knowledge in childhood autism?

II. Literature Review

Autism is the most severe manifestation of a broad spectrum of disorders, categorized as ASD that share some essential features but vary in their respective degrees of severity and age of onset. Incidence of autism has increased globally in recent years as distinct shift in the time of onset of ASD symptoms has become evident. Late onset of autism like starting in the second year was almost unheard in the 1950s, 60s, and 70s. Today such cases out number early onset cases by five to one, as parents with increasing numbers are reporting similar stories. A child, most often a boy, who is developmentally, socially, and verbally normal for his age, suddenly stops acquiring new words and skills in the second year of life and then regresses, losing speech, cognitive abilities, and social skills (Bitton et al., 2015). The worldwide prevalence of ASD is 58.7 per 10,000 individuals with a male to female ratio of 4:1. It estimated that theprevalence ranges from 0.07% to 1.8% and the reason for the increasedprevalence can be attributed to greater public awareness, broadening criteria for ASD diagnosis, early diagnosis, and diagnostic substitution.However, experts disagree about the possible causes and significance of the recent increase in the prevalence of ASD cases, since the limited data on population base rates (Bakare et al., 2008). Relatively fewresearches in psychology has addressed the subject of misconceptions and inexact knowledge among the community regarding ASD (Bain et al., 2009). Having efficient early interventions, it is significant that caregivers of children with ASD can recognize early warning signs and acquire the skills or procedure of assessing and caring for these special children (Klinger et al., 2014).

Saudi Arabia has not yet widely recognized the appropriate strategies of attending to children with special needs. Al-Salehi et al. (2009) reported that although autism is a global disorder, relatively little is

knownabout its presentation and occurrence in many developing countries, suchas Saudi Arabia. In KSA, autism affects six out of every 1000 individuals and four times as many males compared to females. Five separate ministries presented reports to King Abdullah which identify approximately 100,000 registered cases of children with autism in the kingdom. A separate Ministry of Social Affairs study was conducted in conjunction with the Saudi Autism Society in 22 major cities in order to provide support to the families of autistic children as well as any social and medical assistance required. Unfortunately, due to limited resources, only Saudi children are eligible for any assistance or financial aid. It is very interesting to note that as the Saudi Gazette article illustrates, autism is starting to gain more recognitions and therefore treatment opportunities in Saudi Arabia becomes somewhat available (Ghazanfar and Naqvi, 2009).

Typically developing children progress through three phases of communication. First, the intentional communication which is the use of gestures or vocalizations to get attention or attempt to satisfy a need or want. Second, the symbolic communication that consists of use of early language to interact with others, gain attention, and meet requirements. Lastly, the third phase of communication is linguistic communication which is the final and most sophisticated phase. This phase normally entails the ability to engage in full discourse with others through simultaneous use of many different forms of communication (Tager-Flusberg et al., 2005). Children typically notice what the other person is interested in and gain the other person's attention in that same action or activity. Sharing of emotions and reciprocal exchanges of information form an important part of social interaction. These continued interactions with peers and adults contribute to language development. The extent that children with ASD engage in joint attention play can predict the future of their communication skills. Children with ASD are less likely to request joint attention or respond to another person's request for joint attention(AAP, 2012). Symbolic or object play in childhood helps to develop symbol representation and is vital to the development of language skills. Pretend play with objects develops naturally with time and becomes more complex for typically developing children. The understanding of symbols contributes to the comprehension of language. Typically, children with ASD are less likely to participate in symbolic play. Children with ASD who develop functional communication often display atypical communication styles such as echolalia, contact gestures, pronoun reversals and neologisms. It is likely that the cause for development of these styles is due to such children having a limited understanding of the meanings and intentions of symbolic forms of language (Brown and Elder, 2014). Children with ASD may use language to meet needs and respond to questions but tend to make informative comments less often. They use language primarily as a functional tool for tasks like requesting items. In fact, they may not anticipate engagement at all and incline towards declaring or expressing their needs or wants without any expectation for others to engage.ASD children are definitely unique from others. Their communication style is substantially different from the social norm. They experience particular difficulty in understanding the discernments of language related to non-literal vocabulary and non-verbal components of conversation.

To provide quality care, effective communication between a nurse and patient is essential. Breakdowns can leave the nurse and patient feeling frustrated and confused. To facilitate a successful nurse-patient relationship minor adaptation in communication style can help, and environmental sensory stimuli should be minimized. Techniques to help accommodate understanding in children with ASD should be put into practice. Nurses should be prepared for behavioral outbursts and recognize them as signs of frustration. They should be aware of the best way to react. Most importantly, the nurse must remember to provide extra time and be patient throughout the process. Nurses have an inherent responsibility to optimize communication with their patients having ASD (Tager-Flusberg et al., 2005). As well as, Training curriculum is important to increase awareness and skills of health care providers in working with children with autism disorder however these arelimited (Liptak et al., 2006). Such trainings emphasize the importance of recognizing the range of communication styles found among people with autism disorder and providing strategies for helping individuals with autism disorder decrease anxiety and increase social skills (Leblanc et al., 2009). Many studies recommended involving the new technologies such as the smart board, phones, tablets, devices, and software application with ASD children for education purposes which recently showed significant difference in improving their behavior communications skills. People with ASD commonly experience difficulties with social participation, play, and leisure along with restricted and repetitive behaviors that can interfere with occupational performance (Tanner et al., 2015).

Almasoud (2010) in her teaching guide *The education of children with autism in Saudi Arabia* compared the United Kingdom and Saudi Arabia in terms of the educational placements that are available for students with autism and the level of support that is provided to them in both countries. The comparison shows that Saudi Arabia still has a long way to including autistic students in mainstream schools due to several issues, such as lack of government initiatives and, perhaps more importantly, teachers' training and understanding of autism (Almasoud, 2010). It can be mentioned thatsuch guides play an important role in the successful inclusion of autistic students in Saudi Arabia and could have an impact on teachers' practice and understanding, which hopefully could improve the quality of educating students with autism in a welcoming and supportive

environment-one that respects their differences and appreciates their abilities. Accordingly, Saudi government represented by Ministry of Health in 2014 has announced plans to establish three autism centers in Riyadh, Jeddah and Dammam at a total cost of Saudi Riyals 900 million. Health Minister Dr. Abdullah Al-Rabeeah said that *"local media that centers are also being opened for behavior disorders and said that specialists would regularly visit these centers".“The phases in which these centers will be set up are currently being planned. We are in the process of finding land for these projects in coordination with regional authorities,”* said Al-Rabeeah. He added that 20 clinics are available to serve children and facilitate appointments (Almasoud, 2010).The Health Ministry, which is represented in the National Program for Growth and Behavior Disorders, signed a cooperation agreement with the Charitable Society for Autism Families. The ministry said that the agreement aims at providing the ministry's support for the activities and programs carried out by the Charitable Society for Autism Families in the form of expertise and resources, as well as liaising with the society in establishing several training courses and workshops (Arab news, 2014).

III. Methods and Materials

A descriptive research approach was utilized in the study using survey questionnaire to describe pediatric nurses' sociodemographic profile and their knowledge on autism in children as poor, good or excellent. Comparative approach was also used to determine the knowledge differences between socio-demographic characteristics, experience,and whether nurses were exposed or not with the actual autistic patient. Data gathering wasdone in the different pediatric units at King Faisal Specialized Health Research Center(KFSHRC) in Riyadh city ofKSA. The setting was in the said hospitals since it is one of the most prominent and leading healthcare institutions in the KSA with large proportions of pediatric nurses and patient admissions in the pediatric unit as well. KFSHRC is a general hospital and also considered as one of the leading institutions for medical research with total capacity of 100 pediatric beds.

The number of participants was determined based on power analysis. The nursing personnel statistics were taken to determine the number of sample size that could be a representative from the total population 330 professional registered nurses and only 298 registered nurses were working in inpatient pediatric units. The inclusion criteria include: (1) all nurses that have at least 1-year experience in pediatric unit and assign to inpatient unit, (2) assigned as staff nurse, (3) either Saudi or non-Saudi nationality, (4) can speak and write English, and (5) willing to participate in the study. While the exclusion criteria include (1) all the students, trainees, and new employees. In addition, the studyexcludes (2) other health care professional, managers, and supervisors. Any (3) staff nurse with less than 1-year experience, and (4) working in outpatient unit were excluded. Therefore, the 120 nurses or 36% from the total population are the representative samples of the study.Self-administered questionnaire was used to elicit the data needed to gain understanding about the samples'different perspectives, make the most effective use of the time available, and to reach a large number of potential respondents in a variety of locations (Glesne, 2006).The questionnaire was based on the instrument utilized by Enugu et al. (2008) in assessing the knowledge of nurses in Nigeria on ASD. In this study, the research added items on socio-demographic and experience profile which are found in Part 1. Part 2is comprised of items developed by Bakare et al. (2008) which is the Knowledge of Childhood Autism among Healthcare Workers (KCAHW) questionnaire. The KCAHW is standardized questionnaire used to assess the baseline knowledge of pediatric nurses about ASD in four different domains which includesocial (items 1-8), communication (item 9), behavioral (items 10-13), and intellectual (items 14-19).The four domains highlight the following within the 19 items in KCAHW: Domain 1 include symptoms of impairments in social interaction; Domain 2 focus on symptoms of communication impairments; Domain 3 highpoints with the symptoms of obsessive and repeated pattern of behavior; and, Domain 4 refers to the type of disorder childhood autism is and the associated co-morbidities.

Furthermore, this questionnaire is composed of 19 items with options 0 – no, 1- yes and 0-I don't know. Otherwise, items 14, 15 and 19 uses a different pattern which include 0-I don't know, 0- yes and 1- no. Each item has only 1 correct answer which is scored 1 and 0 for wrong answers expectedly.Based on statistical analysis, 3 levels were determined which serveas basis in determining their status on knowledge in childhood autism. Samples has poor knowledge if the overall mean is 0-6, good if 7-12, and the excellent if 13-19 (see Table 1).

Table 1: Level of nurses' knowledge in childhood autism

Level of nurses' knowledge	Total mean score
Poor	**0-6**
Good	**7- 12**
Excellent	**13 - 19**

Pilot study was conducted to refine the text questions, formatting of questionnaire, time needed, clearance of instructions, and internal consistency and validity of the questionnaire.The KCAHW questionnaire has been used in several studies and has been established to have good test-retest reliability, good overall internal consistency (Cronbach's alpha value of 0.97), and culturally valid. In this study, item-total correlation ranged from 0.62 to 0.95 for the total tool and had a Cronbach's α= 0.961.The content validity of the questionnaire was tested through reviews by 5 expertswhich were selected to reduce variations in the background characteristics across the experts, rather than attempting to illustrate a probability sample of all experts. To sustain self-determination of the reviews, all reviewers were asked to carry out the reviews alone. The identity of the other reviewers was not revealed to others except from the researcher. The results indicate that the expert reviews have significance impact in identifying questions problems. Therefore, some changes were applied based on expert's recommendations.Expert's adjustments were discussed and analyzed accordingly until modifications of the questionnaire has been confirmed.

IV. Procedures

Upon the approval of the IRB of the hospital of the office of research affairs in KFSHRC, a waiver consent was obtained from the same institution.Therefore, the preliminary contact with target inpatient pediatric units for information regarding the number of nurses who work in that units commenced and the documents were handed over to the units' designee in order to seek the cooperation for data collection. 260 copies of the questionnaire weredistributed with a cover letter which contain the research approval code and details of the research including the purpose, expectations of the respondents, an offer to answer questions, information on how to contact the researcher, and statement of anonymity and confidentiality. Several meetings wereconducted with the head nurses in the units to orient the samples on the nature and purpose of the research. Head nurses were instructed accordingly to secure the answered questionnaires a week after distribution to the samples. Data collection was done in 6 weeks with a total of 260 questionnaires distributed manually and 125 questionnaires were completed and returned to the researcher (Response rate = 48%).

V. Data Processing, Analysis, and Ethical Considerations

Collected data or responses werechecked for quality and completeness which were then coded and scored accordingly. The data were loaded and analyzed using Statistical Package for Social Science (SPSS®) program version 21. A p-value less than 0.05 were considered significant at the 0.05 level in this study.The study proposal was presented and approved by theIRB of KFSHRC to ensure adherence to the ethical concerns and standards of hospital. The participants were provided with the instrument attached with significant details of the intent and nature of the study including its purpose, methods, and the detailed instructions for the participants to comply. Pediatric nurses answered the questionnaires without any link directed to their names or identification numbers and returned the questionnaires sealed inside an envelope. Pediatric nurses participated voluntarily and not coerced regardless as they either agree or disagree to answer all items in the questionnaires.All answers were upheld confidential.The principal investigator secured awaiver consent form following KFSHRC policy in order topreserve anonymity and emphasize the will of the samples to participate.

VI. Results

According to table (2), results on the socio-demographic characteristics revealed that majority of pediatric nursesare female (88.8%). Nursing has ever been considered a female-dominated profession up to these days even in KSA. Though men are currently entering this field, Saudis believe that because of the profession's social and humanitarian nature, nursing profession is more fitting to women than men.Also, (36%) of the pediatric nursesbelonged to the age group of 30-40 years, (34.4%) are less than 30 years, and (29.6%) of them are above 40 years.Results also showed that majority of the pediatric nurses(79.2%) are foreign or non-Saudi nurses. A report released in 2011 showed that (70%) of thepediatric nurses are still foreign nationals despite the government's strategies of encouraging Saudis to choose nursing. Saudis opt not to be in the nursing profession due to the poor image of nursing, lack of awareness to the opportunities, conflicts to personal and family life due to high workload, low salary, and lack of support for working mothers in KSA (Abu-Zinadah 2004; Al-Sa'd 2007).The efforts made by KSA may not be enough to solve the challenges in increasing their healthcare workforce at present, including nurses with large proportions are not among Saudis (Alamalki et al, 2011).

The education and experience profile of the pediatric nurses are shown in table (3). Majority has bachelor and/or postgraduate degrees (79.2%), while (20.8%) has diploma certificate. Also, results showed that most of them have been working less than 5 years (44.8%). The bachelor's degree graduates in nursing in KSA expectedly spent 4 years in college and 1-year internship before they are accredited as professional nurses. Whereas, the diploma program targets high school students which approximately last for 2 years followed by 6 months of clinical practice and are commonly implemented in private institutions in KSA (Alamri et al., 2006).

Table 2: Socio-demographic profile of the samples (n = 125).

Socio-demographic profile	Parameters	Frequency	Percentage
Gender	**Male**	14	11.2%
	Female	111	88.8%
Age	**Less than 30 years**	43	34.4%
	Between 30 - 40 years	45	36.0%
	More than 40 years	37	29.6%
Nationality	**Saudi**	26	20.8%
	Non- saudi	99	79.2%
Level of education	**Diploma certificates**	26	20.8%
	Bachelor and postgraduate degrees	99	79.2%

Meanwhile, table (3) showed the working experience profile of the pediatric nurses. Result showed that (29.6%) has 5-10 years and (25.6%) has more than 10 years of nursing experience in KSA. Also, majority of the pediatric nurses have been working with the same current rank for (44.8%) less than 5 years (44.8%), while (32.8%) are between 5-10 years, and (22.4%) had more than 10 years. The trend of the less than 5 years' experience and being in the same rank or position may be attributed to the great turn-over of nurses and the high dependency of KSA to expatriate nurses. The dependency will continue to be a great challenge since KSA has an overall ratio of nurses of 40/10,000 people (WHO, 20009). Several expatriate nurses consider KSA as entry destination area before applying for jobs in other developed countries (Almari et al. 2006). Hence, it is evidently a continuing pattern for the expatriate nurses to stay for a short duration as staff nursesin the healthcare facilities of KSA to gain trainings and nurture their marketable potentials to other countries with same demand or crisis in the nursing workforce.Furthermore, result showed that (29.6%), (19.2%), and (15.2%) of the samples were working in pediatric oncology, pediatric medical, and pediatric surgical units, respectively. Other participants are workingat thepediatric cardiovascular (15.2%), pediatric orthopedic (13.6 %),and only (7.2%) in pediatric intensive care unit.

Table 3: Nurses' working experience profile (n= 125).

Working experience profile	Parameter	Frequency	(%)
Experience in KSA	**Less than 5 years**	56	44.8%
	Between 5-10 years	37	29.6%
	More than 10 year	32	25.6%
Experience in the current position	**Less than 5 years**	56	44.8%
	Between 5-10 years	41	32.8%
	More than 10 year	28	22.4%
Current working area	**Pediatric medical**	24	19.2%
	Pediatric surgical	19	15.2%
	Pediatric intensive care	9	7.2%
	Pediatric orthopedic	17	13.6%
	Pediatric cardiovascular	19	15.2%
	Pediatric oncology	37	29.6%

As shown in table (4), the experience of the pediatric nurses regarding their exposure to children with autismwascategorized as to having been exposed or not, and how frequently they have been exposed. Frequent exposure is when these nurses meet children with autism regularly within a week in their working areas, whereas sporadic is when they encounter patients at irregular intervals. Results showedthat majority of the pediatric nurses has exposure (46.4%) to children with autism and (10.3%) from whichwere frequently exposed, while (89.7%) were exposed sporadically. When based on the cognitive theory of learning, theknowledge acquired by nurses during college years arenormally explored, processed, and applied to induce learning fundamentally. The use of learning principles in teaching derived from theories can be very useful in instructional programs like nursing when transferring knowledge and strengthening their theoretical foundations toward patient care (Aliakbari et al., 2015).Hence, nurses do not solely rely on the acquisition of knowledge upon exposure to the actual patients in the working environment; though knowledge is better enhanced with skills or experiences.

Table 4: Frequency of previous experience with autistic children cases

Previous experience with autistic children		Frequency	(%)
Exposure	**Yes**	58	46.4%
	No	67	53.6%
Frequency	**Frequently**	6	10.3%
	Sporadic	52	89.7%

Generally, the knowledge of the pediatric nurses was also assessed as to how they answeredcorrectly for each of the 19 items. The pediatric nurses answered correctly with about (60%) in item 1 and lowest (80%) in item 8 in Domain 1. In Domain 2, item 9, (68%) responded correctly as to whether there is a delay or total lack of development of spoken language in autistic children. Result of the test in domain 3 showed that respondents answered correctly in item 10 (74%), 12 (68%), 13 (64%), and 11 (56%). Lastly, in domain 4, (53%) of the participants answered on item 14 and (51%) on item 15 correctly answered. In summary, based on the percentage distribution of correct answers, it was observed thatthe lowest percentage distribution is in Domain 4. This domain address knowledge on the types of autism, onset and possible co-morbid conditions.Moreover, results showed in table (5) that the mean overall knowledge score regarding Domain 1 was (6.07) out of (8.00). While the mean of overall knowledge score in Domain 2 was (0.68) out of (1.00), and Domain 3 was (2.58) out of (4.00). Finally, in Domain 4 was (1.88) out of (6.00). Therefore, the overall score levels of nurse's knowledge about childhood autism was (11.11) out of (19.00). According to criteria, the respondent's knowledge was within 7-12 interval which is regarded as having good knowledge on childhood autism.

Table 5: Overall Score levels of nurse's Knowledge about childhood autism

Knowledge Score	Range of Possible score	Minimum	Maximum	Mean	SD
Domain 1	0-8	0.00	8.00	6.07	2.20
Domain 2	0-1	0.00	1.00	0.68	0.47
Domain 3	0-4	0.00	4.00	2.58	1.30
Domain 4	0-6	0.00	6.00	1.78	1.02
Overall Knowledge Score	0-19	0.00	19.00	11.11	3.82

SD: Standard Deviation.

Results in comparison is shown in either table 6.1 or 6.2, revealed that there are no significance differences on the overall knowledge score and the socio-demographic profile which include age groups ($p > 0.05$), level of education ($p>0.05$), and nationality($p>0.05$). However, there is a significant difference on the knowledge score between males and females ($p<0.05$). Therefore, the female pediatric nurses (mean= 11.42) has statistically higher knowledge than the male pediatric nurses (mean= 8.64).

Table 6.1: Differences in the overall knowledge about autism disorder in relation to the socio-demographic profile using Mann Whitney U test

Socio-demographic and working experience profile	Mann Whitney U test value	p value	Remarks
Gender	490.00	0.024	Significant
Nationality	1030.00	0.690	Not significant

The profile of the pediatric nurses regarding their working experience, including the categorical years of working ($p>0.05$), categorical years of holding same position ($p >0.05$), and the area in the pediatric units ($p >0.05$) showed no significant differences with their overall knowledge (see table 6.2).

Table 6.2: Differences in the overall knowledge about autism disorder in relation to the socio-demographic and experience profile using Kruskal Wallis Test

Socio-demographic and working experience profile	x^2	p value	Remarks
Age	0.257	0.880	Not significant
Level of education	3.662	0.300	Not significant
Experience in KSA	0.224	0.894	Not significant
Experience in current position	0.222	0.895	Not significant
Current working area	3.742	0.291	Not significant

However, results revealed that there were significant differences in the overall knowledge between pediatric nurses having exposure to children with autism cases or not ($p< 0.05$). The overall knowledge was also found out to be different between frequent, sporadic and never. Having previous experience with children with autism, by Mann-Whitney test, illustrated that the p-value is also lower than 0.05, therefore the 3 groups were statistically different (see table 7). Being frequently handling cases of autism in children yields these pediatric nurses with better knowledge compared to those who encountered similar cases sporadically or never at all.

Table 7: Differences betweenexposure groups in related to overall knowledge about autism disorder Mann Whitney U test

Overall knowledge score	**Demographic characteristics**		**Freq.**	**Mean**	**STD**	**Mann Whitney U test value**	**p-value**
	Previous experience with children with autism(Exposure)	Yes	58	12.517	2.71	*1137.50*	*0.00*
		No	67	9.896	4.23		
	Previous exposure with children with autism	Frequently	5	12.600	1.673	*13.942*	*0.001*
		Sporadic	53	12.472	2.805		
		Never	66	9.925	4.244		

t: t-value, d.f.: degrees of freedom, p: significance level at 0.05

VII. Discussion

Based on literature review, increasing the public and professional awareness in ASDs can lead to early recognition, diagnosis and interventions which are known to improve prognosis of the client. The most essential role of the nurse in autism is educating the family and the patient on the manifestations, management, and other relevant aspects of autism and autistic disorders (Igwe et al., 2011). Hence, the knowledge or understanding of the nurses on diseases has a pronounced influence in the success of managing such cases. The knowledge scores in this study were skewed into poor, good and excellent which was in contrast with the study conducted by Igwe et al. in 2011 which uses the same research instrument. Igwe et al. recognized that the pediatric nurses, who are members of multidisciplinary teams caring for autistic children, has poor knowledge in autism. In addition, findings of this studyon the paediatric nurse's knowledge about ASD was alsovaried with the study of Bakare et al. (2008) which was conducted in Nigeria and other sub-Saharan African countries. His study found out that nurses have poor knowledge, and that poorawareness about autism has been a major barrier in improving the health and well-being of ASD children.Bakare et al. (2009) noted that nurses working in tertiary health institutions in south-east and south regions of Nigeria scored low on the KCAHW questionnaire and knowledge gap was found to be higher in domain 3,followed by domain 1, then domain 4 and the least was domain 2. In contrast to the study by Bakare et.al, knowledge gap in this study was found to be higher in domain 4, followed by domain 2, then domain 3, and the knowledge was far better in domain 1 which is the social component of the knowledge. Inglese and Elder (2009) study found out that the overall nurse's knowledge and experience about ASD shouldbe marked up differently in all four domains, which alsoconcurred in this study that in the overall knowledge of all the domains, pediatric nurses scored well and regarded good based on KCAHW tool. The pediatric nurses must have established good theoretical foundations while in college and other external factors which helped provide sufficient information for them to follow suitable and fundamental assessment and management for children with autism.However, in this study, experiential learning is found to be statistically different from those without exposure wherein their mean score is high compared to the latter. Hence, the overall knowledge on autism may have been founded during college years but this can be advanced with experience and frequent exposure to cases of autism as found out in this study.

The second aim of this study was to identify the factors that affect the nurse's knowledge about childhood autism including age, gender, nationality and level of education. Even though the non-Saudi nationals were the majority, the Saudi arabian nurses might be able to provide better care for the children with autism as the majority of these children will be from the same cultural background. Though the assumption has not been statistically proven in this study as to nationality has an impact of caring for autistic children, but having similar language and culture can lead to a better understanding by Saudi arabian nurses. Hence, increasing the proportion of Saudi Arabian nurses is recommended by the upholding nursing profession with a positive image, intensifying trainings to enhance competency and safety, financial support on education and training among students and employees, and favorable increase and early salary compensation (Alamalki et al, 2011). On the other hand, majority of the respondents in this study are Non-saudian nurses and results showed that overall they are good in knowledge on autism. Hence, though they don't necessarily speak and behave the way their Arabian clients are, but they are equipped with the good knowledge which they could have acquired in both school and experience, to take care of autistic children.Regarding the demographic data on gender, the number of female pediatric nurses dominated male nurses. In the age groupdata, most of the participants were aged between 30-40 years. According to results, female was higher in their mean overall knowledge score than males and was proven in this study that the females' knowledge score is statistically higher than the males. This result is parallel with the previous study conducted by Grossman (2013), which showed that female nurses are providing better care for the patients. Hence, the female pediatric nurses can relay more relevant information to parents as well as assist and manage children with ASD. Most of the participants have a bachelor degree, thus they have the theoretical knowledge on autism which is similar with a previous study that showed high scores for undergraduate students. The resultsgive an evidenced-based basis on the positiveimpact ofthe curriculum in

nursing schools and trainings in the hospitals in KSA (Bakare et al., 2015). Majority of the nurses have a good amount of experience in their working field in the KSA and yet they have either frequent or sporadic encounters with autistic children, the knowledge which they gained in their previous and college years have made them prepared to address the need of their patients and significant others.The overall outcomes of thisresearch indicate that pediatric nurseshave strong academic background but they do not have any previous experience working with autistic children.A research by James, in 2007, found that nurses need to have an adequate knowledge, training and educational background to help and work for providing better care for the autistic children. In this study, researcher found a large number of nurses withgaps regarding ASD knowledge including other symptomatology and related medications, White et al. (2008) stated that knowledge about childhood autism is greatly associated with the groups with experience andthose with previous experience which area of speciality is recommended d to provide better child healthcare services.

Despite most of nurses having 1 to 10 years' experience of working in the current position, participant nurses were already working in various pediatric specialties. The nurses with experience will bebetter than those with no previous experience at all. In terms of frequency, the pediatric nurses which has not experiencedworking with autistic children will require linicaltraining. In this study the researcher found that there are no significance differences related to area of specialization which is consistent with the results in other study done in Nigeria (Bakare, 2008). This result implies that learning methods and continuous training are vital process for the nurses who work in all pediatric areas. A structured teaching program also can be helpful for the nurses in order to update and enhance their knowledge and skills more about managing autism.Nurses who have previous experience working with autistic children will be better in recognizing and identifying the symptoms of autism.A special attention and care plays avital role in children's development. Impairment in attention may lead to alteration in the favorable development in social, cognitive and other language skills among children. Language deficits in particular patients with ASD are most likely to influence recurrent attention impairment. It is necessary that nurses gain the required knowledge on the deficiencyconcerns of these children so that they can provide effective client-centered care.As children with autism need individual specialized assessment and treatment, nurses need to be properly educated because on the variations of spectrum of ASD that not all patients are similar.Caring for children with childhood autism and other pervasive developmental disorders requires the collaborative services of medical professionals like psychiatrists, pediatricians, nurses, clinical psychologists and others (Gelder et al., 2003). Subsequently, these pediatric nurses are usually the front line of multidisciplinary team, so some important recommendations were suggested based on the researcher point view, which could be tackled for further stakeholder's interest.

VIII. Limitations

The present study has been conducted at KFSHRC, and it cannot be generalized as it was done in a single institution.Even KFSHRC covers a central geographical area with capacity of high employment from different nationalities, sample size was limited.Data gathering was distributed and collected after the pediatric nurses answered them completely. This method is preferred in order to avowing these participants to discuss their answers to each other. The KCAHW questionnaire mainly assesses the knowledge particularly on social, behavior, communication and cognitive domains. The tool used also covers both socio-demographic data (age, gender, nationality, and level of education) and the working experience of the pediatric nurses. The questionnaire does not include assessing other causes of influence of the pediatric nurses' knowledge on childhood autism.In order to fulfil the aim and objectives of the study, this study gathered primary from the paediatric nurses and secondary resources were used for citations. The secondary resources and related analysis was contained data gathering all relevant topics from the secondary resources such as research papers and several other article resources on the same research topic.

IX. Conclusion

The study showedthat the overall knowledge of pediatric nurses on childhood autism, was good and has been statistical proven to differ on gender and frequent exposure to these cases.Therefore, building a comprehensive theoretical foundation on pediatric nursing management is critical and vital towards producing knowledgeable nurses on child care.Pediatric nurses are essential members of the multidisciplinary team in the management of children with autism. Thus, continuing nursing education and exposure is highly recommended among pediatric nurses which may be accomplished through postgraduate education, seminars and workshops and trainings in the actual settings. These activities will enhance pediatric nurses' knowledge and concurrently their skills on the early detection and appropriate nursing management for childhood autism.

X. Recommendations

Because the etiology of autism is still unknown, education must be an ongoing process where nurses can work closely with other professionals to increase their knowledge.Qualified experienced nurses are needed to educate parents so that early identification can be done. To provide better care for children and adolescents with ASD, it is vital that the pediatric nurses also regularly perform primary assessment of each cases.

Diagnostic procedures must include surveillance, the timing of the diagnosis; history from the parent must also be taken during the assessment. Patients also can be shown with some pictures what is going to be done regarding assessment and treatment procedures. Nurses must use simple language when talking to the parents, also the shortage language possible, for example sentence like *"It will hurt for a minute"* which could bring the word pain in their mind. It is also important to check whether patients understand the communication because some patients have got good speaking ability but lack complete understanding. Control studies can be introduced for nurses before and after receiving certain types of training on autism care.Nurse's educational programs regarding autism should include: communication skills that essential for providing early support, ways of social interventions, intensive behavioural programs, and interventions related to behaviour. Programs also can include concisely the pharmacological therapy.Organization must introduce the child health screening and surveillance program so that early detection is possible and nurses must be trained properly especially those who don't have enough previous knowledge on autism. As one of the best practicesis to create a professional team in the hospital, so better care can be provided for autistic children.

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