

# Pediatric neuro-developmental and behavioral disorders

## Practitioners' perspectives

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### ABSTRACT

**Objective:** Developmental and behavioral (DB) disorders are commonly encountered in the general pediatric and neurology practices. There is a strong demand for trained developmental pediatricians and child psychiatrists in our region. In this study, we aimed to study practitioner's experiences in dealing with these disorders and their referral practices.

**Methods:** Attendees of an international pediatric symposium on neuro-developmental and behavioral disorders were included. The symposium was conducted by the Department of Neurosciences, King Faisal Specialist Hospital and Research Center in Jeddah from 4-6th March, 2003. A structured 25-item questionnaire was designed to examine their demographics, training, practice and referral patterns.

**Results:** A total of 167 attendees registered for the symposium and 131 (78%) questionnaires were returned. Participant's ages were 23-69 years (mean 36, SD 8.5), with 67% being females. Many participants were practicing general pediatrics (43.5%) and the majority (92%) frequently saw and followed children with DB

disorders. However, only 24% felt highly confident in their management. As well, only 35% and 31% of physicians received structured developmental and psychiatry rotations, during their training. Those who received a structured developmental rotation felt more comfortable in making the correct diagnosis (odds ratio (OR) 4, 95% confidence interval (CI) 1.2-14,  $p=0.01$ ) and in providing appropriate treatment (OR 3.8, 95% CI 1.4-11,  $p=0.006$ ). Many participants (32%) had no direct access to a developmental pediatrician or child psychiatrist for referrals.

**Conclusion:** Developmental and behavioral disorders are common in daily pediatric practice. Most practitioners did not receive a structured rotation covering these disorders during their training and were not highly confident in managing affected children. Given the limited number of developmental pediatricians and child psychiatrists, we highly recommend appropriate developmental and psychiatric training for practitioners.

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Developmental pediatrics and child psychiatry are considered new and evolving specialties.<sup>1-3</sup> Over the last century, remarkable advances at both the basic and clinical levels have considerably

improved our ability to evaluate and treat children with developmental and behavioral (DB) disorders.<sup>1,4</sup> These disorders are commonly encountered in the general pediatric and pediatric

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neurology practices. In one study, 32% of new referrals to general pediatrics were for DB problems.<sup>5</sup> Others found at least one psychosocial or developmental problem in 27.5% of the children seen in a community based primary care pediatric practice.<sup>6</sup> Trained developmental pediatricians and child psychiatrists are very few and are available in selected tertiary care centers of large cities. In many parts of the USA, for example, these specialties were considered a national priority.<sup>2,7</sup> In view of the given limitations, general psychiatrists, pediatricians, and pediatric neurologists are frequently faced with these children, adding to their large volume of referrals and consultations.<sup>8,9</sup> Pediatricians particularly do not feel comfortable dealing with children with neurological complaints.<sup>8</sup> A recent study found that formal developmental and behavioral screening often was not included in general pediatric practice.<sup>10</sup> Barriers to the provision of developmental and behavioral screening included the need for special developmental pediatric training.<sup>10</sup> In an Australian study, up to 70% of general pediatricians rated training in development and behavior as having been inadequate.<sup>11</sup> They found that less than one third of general pediatricians had formal training in developmental and behavioral pediatrics. Most practicing pediatricians acquire their knowledge by clinical experience, books, journals, professional contacts or meetings. Almost 80% of pediatricians felt that the practical ad hoc experience was not an adequate substitute for formal training in developmental and behavioral pediatrics.<sup>11</sup> Appropriate training of pediatric practitioners might reduce the unnecessary pressure placed on the limited number of sub-specialists and provide better service to the affected families.

We hypothesized that many pediatric practitioners are faced with many children with DB disorders and that they generally do not feel comfortable dealing with these children because of multiple factors, particularly relating to their teaching experiences and lack of an effective referral system. We aimed to evaluate these issues and to examine the referral practices and access to developmental pediatricians and child psychiatrists among pediatric practitioners.

**Methods.** The study included registered attendees of an international pediatric symposium on neuro-developmental and behavioral disorders conducted by the Department of Neurosciences, King Faisal Specialist Hospital and Research Center (KFSH&RC), Jeddah, Kingdom of Saudi Arabia on 4-6th March, 2003. The KFSH&RC is a large tertiary care facility that provides adult and pediatric care for a regional population of western Saudi Arabia. The 2½-day symposium was directed to general pediatricians. It also included some updates

and focused on presentations that would interest those who look after children with related disabilities, such as neurologists, physio/occupational therapists, educators, and psychiatrists (**Table 1**). There were 24 clinical presentations covering 4 different neuro-pediatric disciplines including pediatric neurology, developmental pediatrics, child psychiatry-psychology, and physical medicine-rehabilitation (**Table 1**). Twenty faculty members, including 5 distinguished international speakers, gave these presentations. A final workshop in the Arabic language was presented to the public and parents of children with special needs. The study author was the chairman of the organizing committee and a member of the scientific committee. The symposium was awarded 10 continuous medical education credit hours by the Saudi Council for Health Specialties. Before participating in the study, the attendees were assured that taking part in the study was voluntary and that their identity would remain anonymous. A structured 25-item questionnaire was designed to examine their demographic characteristics, training, qualifications and practice experiences (**Table 2**). There were 4 Likert scale items,<sup>12</sup> to examine the participant's practices and confidence in dealing with pediatric neuro-developmental and behavioral disorders (**Table 3**). Response categories to the Likert scale items were: 1. Not at all, 2. Somewhat, 3. Moderately so, and 4. Very much so. The next section of the questionnaire included questions about their access to a developmental pediatrician and child psychiatrist for referrals and consultations. Finally, an overall evaluation of the symposium was requested (excellent/very good/good/fair/poor), and an open-ended item was given for additional or specific comments. The symposium organizing committee facilitated the distribution of the questionnaires at the registration time. The completed forms were collected at the end of symposium when continuous medical education certificates were distributed.

The data were tabulated and analyzed using chi-square statistics for categorical variables.<sup>13</sup> The magnitude of significant associations is presented as *p*-values, odds ratios (OR), and the 95% confidence interval (CI) for the OR. A *p*-value of <0.05 was considered statistically significant.

**Results.** One hundred and sixty-seven attendees registered for the symposium. One hundred and thirty-one (78%) questionnaires were returned, however, 12 forms were incomplete and therefore excluded. The remaining 119 questionnaires were included. The participant's ages ranged between 23-69 years (mean 36, SD 8.5), with 67% being females. Their position, specialty, qualification, and practices are summarized in **Table 2**. Most

Table 1 - Topics covered in the international pediatric symposium on neuro-developmental and behavioral disorders.

Topic	Presenter's Specialty	Duration*
<b>General reviews &amp; updates</b>		
Developmental Pediatrics & Child Health	Developmental Pediatrics	40 minutes
Basics of Developmental Assessment	Developmental Pediatrics	25 minutes
Basics of Cognitive Assessment	Child Psychology	25 minutes
Attention Deficit Hyperactivity Disorder	Pediatric Neurology	25 minutes
Children and the Television	General Pediatrics	25 minutes
Brain Developmental Malformations	Neurosurgery	25 minutes
Update on Childhood and Adolescent Depression	Psychiatry	25 minutes
Update on Physical Rehabilitation	Physical Medicine	25 minutes
Psychopharmacotherapy in Childhood	Psychiatry	25 minutes
<b>Focused or sub-specialized presentations</b>		
Aphasia, Autism, and Epilepsy	Epileptology	40 minutes
Quality of Life Issues in Children with Epilepsy	Epileptology	40 minutes
Tics and Tourette Syndrome	Pediatric Neurology	25 minutes
Pediatric Pseudoseizures	Pediatric Neurology	25 minutes
Dissociation versus Factitious Disorders	Psychiatry	25 minutes
Neuropsychiatry of Traumatic Brain Injury	Child Psychiatry	25 minutes
Posttraumatic Stress Disorder	Child Psychiatry	25 minutes
Swallowing Disorders in Children	Speech Pathology	20 minutes
<b>Research based presentations</b>		
Therapeutic Influences on Cerebral Palsy	Developmental Pediatrics	40 minutes
Evaluation of Learning Disabilities in Saudi Arabia	Child Psychology	35 minutes
Genetics of Brain Malformations and Autism	Pediatric Neurology	35 minutes
Dietary Interventions in the Treatment of Autism	Pediatric Neurology	25 minutes
Verbal - Performance Discrepancy	Child Psychology	20 minutes
Using Car Seats as Alternative Seating Systems	Occupational Therapy	20 minutes
Standardization of the Revised Denver Scale	Education	20 minutes
<b>Public session on children with special needs</b>	Panel (open discussion)	2 hours
*Duration of the presentation excluding the discussion time		

participants were general pediatricians. However, 35.5% of the attendees were non-physicians mostly practicing in the field of disability or DB disorders (Table 2). The majority (85.5%) practiced within the Jeddah area. Excluding medical students, the number of years of postgraduate training ranged between 1-14 years (mean 4.7, SD 2.3). Most participants (55%) received their training within Saudi Arabia, 12% in Europe, and 18% received North American training. The remaining 15% received training in other parts of the world. Overall, 40% received a structured pediatric developmental rotation during their training (35% of the physicians) lasting 1-6 months (mean 3.3, SD 1.8). As well, 28% received a structured psychiatry rotation (31% of the physicians) lasting 1-6 months (mean 2.2, SD 1.5). The number of years in practice (medical students excluded) ranged between 1-35 years (mean 10, SD 8). Of those in general pediatrics, 57% had plans for sub-specialization, 49% of these being in the neuroscience field (neurology 18%, psychiatry 18%, developmental pediatrics 13%).

Table 3 shows the results of the Likert scale items examining participant's practices and confidence in dealing with pediatric neuro-developmental and

behavioral disorders. Clearly, although they often saw and followed these children, confidence in making the diagnosis and providing treatments was not optimum. Only 19.5% and 29% were highly confident in diagnosing or treating children with neuro-developmental and behavioral disorders (Table 3). Those who received a structured developmental rotation felt more comfortable in making the correct diagnosis (OR 4, 95% CI 1.2-14,  $p=0.01$ ) and in providing appropriate treatment (OR 3.8, 95% CI 1.4-11,  $p=0.006$ ). However, receiving a structured psychiatry rotation did not have a statistically significant impact. As expected, residents were 8.5 times more likely to feel uncomfortable in establishing the diagnosis when compared to consultants and specialists (95% CI 2-49,  $p=0.001$ ); however, they were as likely to feel uncomfortable managing children with DB disorders. Interestingly, those who reported seeing and following many children with these disorders (4 on the Likert scale) were more likely to feel comfortable in their diagnoses ( $p=0.01$ ) and management ( $p=0.0004$ ) when compared to those who saw fewer patients (1-3 on the Likert scale). Only 34% and 30% of the participants had access to a developmental pediatrician or child psychiatrist

Table 2 - Position, specialty, qualification, and practice of the participants (n=119).

Variable	Number/Total* (%)	
<b>Position</b>		
Consultant	55/118	(47)
Specialist / therapist	24/118	(20)
Resident	18/118	(15.5)
Nurse	10/118	(8.5)
Teacher	4/118	(3)
Intern or student	2/118	(2)
Other	5/118	(4)
<b>Specialty</b>		
Pediatrics	50/115	(43.5)
Physio/occupational therapy	13/115	(11.5)
Neurology	9/115	(8)
Psychiatry	8/115	(7)
Psychology	6/115	(5)
Speech therapy	5/115	(4.5)
Education	4/115	(3)
Other	20/115	(17.5)
<b>Qualification</b>		
Arab / Saudi Board	29/106	(27)
Medical Degree only	22/106	(21)
FRCPC / FRCSC**	9/106	(8.5)
Master degree	8/106	(7.5)
MRCP***	7/106	(7)
None	2/106	(2)
Other	29/106	(27)
<b>Practice</b>		
Ministry of Health	26/113	(23)
Private Hospital	24/113	(21)
Disability center	20/113	(18)
University Hospital	18/113	(16)
Military/National Guard Hospital	11/113	(10)
Other	14/113	(12)
*Total number of those who responded to the question		
**FRCPC - Fellow of the Royal College of Physicians of Canada		
**FRCSC - Fellow of the Royal College of Surgeons of Canada		
***MRCP - Member of the Royal College of Physicians (United Kingdom)		

Table 3 - Results of the Likert scale items examining participant's practice and confidence in dealing with neurodevelopmental and behavioral disorders.

Question items	(%)	Mean score*
<b>Do you frequently see and follow children with neuro-developmental disorders?</b>		2.95/4
1- Not at all	6	
2- Somewhat	30	
3- Moderately so	26	
4- Very much so	38	
<b>Do you frequently see and follow children with behavioral disorders?</b>		2.59/4
5- Not at all	11	
6- Somewhat	39	
7- Moderately so	29.5	
8- Very much so	20.5	
<b>Do you feel comfortable diagnosing these disorders?</b>		2.6/4
1- Not at all	13	
2- Somewhat	33	
3- Moderately so	34.5	
4- Very much so	19.5	
<b>Do you feel comfortable treating these disorders?</b>		2.69/4
1- Not at all	19	
2- Somewhat	21	
3- Moderately so	31	
4- Very much so	29	
*Minimum score = 1 and maximum score = 4		

for referrals, within the same hospital. The remaining 41/44% had to refer the child to another hospital within the same city, 6/6.5% to another city, and 19/19.5% had no access to a developmental pediatrician or child psychiatrist for referrals at all. Regarding the overall evaluation of the symposium, 26.5% felt that it was excellent, 56% very good, 16.5% good, 1% fair, and none gave it a poor rating.

**DISCUSSION.** The importance of developmental and psycho-behavioral issues for children's well-being has long been recognized, and their importance in the practice of pediatricians is well documented.<sup>6</sup> Our results suggest that most practitioners in the studied sample were not highly confident in handling children with DB disorders and only 1/3 received a structured rotation during their training. This is similar to the figures reported by other investigators.<sup>11</sup> Maybe predictably, those

who saw and followed many children with these disorders were more likely to feel comfortable in their management, reflecting the importance of clinical experience. As well, those who received a structured developmental pediatric rotation felt more comfortable in making the correct diagnosis and in providing appropriate treatment, particularly in developmental pediatrics. Other investigators found that residents had a greater knowledge in developmental assessment after completing a developmental pediatrics rotation.<sup>14</sup> This led investigators to recommend a minimum of 3 months to be spent in developmental pediatrics and child psychiatry during general pediatric training.<sup>5</sup> Although many training programs, in the USA, for example, reported a lack of adequate faculty, teaching materials, and methods in teaching DB pediatrics to residents, this specialty training remains mandatory.<sup>15</sup> Interestingly, psychiatry rotations did not have a similar impact in our

sample, probably as a result of the training experience or the complexity and diversity of the specialty. Management of children with behavioral disorders is challenging even to the sub-specialist.<sup>2</sup> In fact, child psychiatry residents felt least prepared by their training in treatment of children with complicated developmental disabilities and cognitive-behavioral abnormalities.<sup>2</sup> Generally, our residents were less confident in establishing the diagnosis when compared to consultants and specialists; however, they were as likely to feel uncomfortable in providing treatment to children with DB disorders. In other words, completing the residency did not necessarily alter the difficulties encountered in handling these disorders.

In developed countries, general pediatricians referred up to 26% of children with DB problems to sub-specialists.<sup>5,6</sup> Only one third of the participants in this study had direct access to a developmental pediatrician or child psychiatrist for referrals confirming the paucity of these sub-specialists in our region. There seems to be a global shortage of these specialties that needs to be evaluated and addressed systematically.<sup>2,7</sup> Even in developed countries such as Canada, significant delays (mean of 15.5 months) were observed between initial diagnosis and developmental pediatric assessment.<sup>16</sup> This assessment revealed a different diagnosis than that initially suspected by the referring physician in more than one third of the children, stressing the importance of this specialty.<sup>16</sup> Some physicians maybe unfavorably disposed to children with DB disorders. We recently evaluated the attitudes of senior medical students to pediatric neurological disorders and found that although 92% found them challenging and interesting, the majority (77%) had unfavorable attitudes when it come to managing these disorders.<sup>17</sup> However, the actual clinical pediatric experience may influence these unfavorable attitudes and encourage the physicians to pursue a career in the same specialty.<sup>18</sup> We need to stimulate and interact with residents and generalists to increase their interest in developmental pediatrics and child psychiatry.

There are some limitations to our study. First, our sample is somewhat biased to females who represented 2/3 of the attendees. However, females generally are more likely to be interested in pediatric specialties.<sup>18</sup> Kaplowitz et al<sup>19</sup> confirmed a continuing recent trend for women to have a greater interest in careers in pediatric specialties. Secondly, our sample is small and may not be representative of pediatric practitioners, as the participants selected to attend this DB symposium. This may reflect either special difficulties, or interest, in the field. In fact, one half of those who had plans for sub-specialization selected a neuroscience specialty, reflecting their general interest in neuroscience. This fact may limit our ability to generalize from

our findings. However, our sample was representative of the wide spectrum of practitioners looking after children with various DB disorders. We also had a high response rate (78%), wide age variation and representation from several institutions, physician categories, and supporting staff.

In conclusion, developmental and behavioral disorders are commonly encountered in daily pediatric practice. Most practitioners in the field never received a structured rotation during their training and are not highly confident in diagnosing and treating affected children. Given the limited number of developmental pediatricians and child psychiatrists, we highly recommend that practitioners receive appropriate developmental and psychiatric training. This can be accomplished during their residency and by attending interactive continuous medical educational activities such as the symposium outlined in this communication.

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