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Reported Wandering Behavior among Children with Autism Spectrum Disorder and/or Intellectual Disability

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Abstract

Objective—To characterize wandering, or elopement, among children with autism spectrum disorder (ASD) and intellectual disability.

Study design—Questions on wandering in the previous year were asked of parents of children with ASD with and without intellectual disability and children with intellectual disability without ASD as part of the 2011 Survey of Pathways to Diagnosis and Services. The Pathways study sample was drawn from the much larger National Survey of Children with Special Health Care Needs conducted in 2009-2010.

Results—For children with special healthcare needs diagnosed with either ASD, intellectual disability, or both, wandering or becoming lost during the previous year was reported for more than 1 in 4 children. Wandering was highest among children with ASD with intellectual disability (37.7%) followed by children with ASD without intellectual disability (32.7%), and then children with intellectual disability without ASD (23.7%), though the differences between these groups were not statistically significant.

Conclusions—This study affirms that wandering among children with ASD, regardless of intellectual disability status, is relatively common. However, wandering or becoming lost in the past year was also reported for many children with intellectual disability, indicating the need to broaden our understanding of this safety issue to other developmental disabilities.

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Autism spectrum disorder (ASD) is a complex neurodevelopmental disorder characterized by a range of impairments in social communication and interaction as well as in restricted and repetitive behaviors and interests.[1] ASD can co-occur with other medical and developmental conditions (eg, epilepsy, intellectual disability) and with other symptoms, such as variable attention and limited verbal language, that pose potential challenges to everyday functioning.[1] Although little is known about the long-term health of people with ASD, higher than expected mortality rates have been documented in association with epilepsy, severe intellectual disability, and accidents, such as suffocation or drowning.[2-4] Parents of children with ASD have worked to raise awareness of a tendency for these children to wander as a preventable source of accidents and untimely death.[5,6] Wandering, also called elopement, occurs when someone leaves a safe area or a responsible caregiver and can result in potential injury or harm to that person; wandering is a behavior that goes beyond a brief period, such as when a typical toddler may run off from a caregiver.[7,8] Challenges with communication, social interaction, attention, reasoning, unusual interests, and learning can potentially put some people with developmental disabilities, such as ASD or intellectual disability, at risk for becoming lost or injured because of wandering. Recently, parents shared stories of tragic accidents and deaths with the Interagency Autism Coordinating Committee and asked for more help understanding and preventing safety risks related to wandering.[6,9]

Most research on the occurrence and prevention of wandering or elopement is based on elderly adults with dementia-associated cognitive impairments.[10] Studies of wandering among individuals with ASD and intellectual disability have been based on limited samples[7,11-14] or have focused on specific behavioral interventions used to address elopement in 1 or 2 individuals.[15-20] A larger study among children with severe ASD and/or intellectual disability reported wandering problems classified as “minor” among 23% of the sample and as “marked” among 16%.[12] Another study of 161 severely affected adults with ASD living in an institution found 34% of those with autistic disorder and 19% of those with pervasive developmental disorder-not otherwise specified were reported as leaving supervision without permission (elopement).[13] Based on a recent survey of parents of children with autism enrolled in a large, online autism research registry, about one-half (49%) of children and youth with an ASD were ever reported to have wandered after the age of 4 years.[7] Of those children, 26% were missing more than momentarily so that serious concern was reported. Among reported wanderers, they were most commonly reported in danger of drowning or traffic injury. Parents reported the child wandered off most often from the family's own home or another home (74%), stores (40%), and classrooms or schools (29%). The primary reasons reported for wandering included enjoyment of running or exploring, getting to a place or object he or she enjoys (eg, water or a road sign), and to escape a demand or situation (eg, loud noise).

Given the frequency of caregiver report of wandering as a major problem behavior and the potential for significant harm to the individual, it is important to understand more about the occurrence and characteristics of people with disabilities who wander. Currently, there are small interventional studies demonstrating the utility of individualized functional behavioral techniques in the treatment of wandering with people with ASD and/or intellectual disability.[13-18] In addition, there are burgeoning efforts to raise awareness, develop strategies, and use technology for prevention and intervention, but with limited data to inform these efforts.[5,21,22] This study describes the reported occurrence of wandering from a nationally representative sample of children with current ASD and/or intellectual disability and provides the frequency, location, characteristics of children, and prevention attempts across these diagnostic groups.

Methods

Data for this study are from the 2011 Survey of Pathways to Diagnosis and Services (also known as the "Pathways" study) conducted by the National Center for Health Statistics (NCHS).[23] The Pathways study sample was drawn from the much larger National Survey of Children with Special Health Care Needs (NS-CSHCN) conducted in 2009-2010 by NCHS and funded by the Maternal and Child Health Bureau.[24] The NS-CSHCN was a cross-sectional, population-based random-digit dial telephone survey in all 50 states and the District of Columbia among households with children age 18 years and younger, and was intended to assess the health, functional status, and service use of children with special healthcare needs. Participating parents/caregivers were asked a series of screening questions indicating special healthcare needs (responses indicating the child has a physical, emotional, developmental, or behavioral problem that is expected to last more than 12 months and requires medical, educational, or other therapeutic services).[25] If more than 1 child was eligible in a given household, one was randomly selected to be the subject of the caregiver survey. The data collection procedures were approved by both the NCHS Research Ethics Review Board and the institutional review board at National Opinion Research Center at the University of Chicago.

As part of the NS-CSHCN, caregivers (almost always parents) were asked if "a doctor or health care provider had ever told them that their child had autism, Asperger disorder, pervasive developmental disorder, or other ASD?", "...any developmental delay that affects [his/her] ability to learn?", ...or an "intellectual disability or mental retardation?" Parents were also asked if the child currently had the condition. In addition, questions were asked about the presence of cooccurring psychiatric conditions, including "depression," "anxiety problems," "attention-deficit disorder or attention-deficit hyperactivity disorder (ADHD)," or "behavioral or conduct problems." These conditions were first identified in the NS-CSHCN and confirmed in Pathways.

The Pathways follow-up study was completed in 2011 on a sample of 4032 children ages 6-17 years whose parent or guardian completed the NS-CSHCN in 2009-2010 and reported they had once been told by a doctor or other healthcare provider that the child had ASD, intellectual disability, or developmental delay. There were 2 components of the Pathways follow-up study, a telephone survey and a self-completed questionnaire. This analysis includes responses from both components. For this article, the analyses were restricted to children with a reported current diagnosis of ASD or intellectual disability at the time of the Pathways survey (n = 2077). Children were subdivided further into ASD only (n = 1117), ASD with intellectual disability (n = 303), and intellectual disability only (n = 657). Parents were asked to confirm the previous NS-CSHCN diagnosis from a doctor or healthcare provider and were also asked the follow-up question "to the best of your knowledge does (your child) currently have (autism or ASD) or (an intellectual disability)?" The completion rate for the Pathways telephone interview was 62%. (Of those parents with eligible CSHCN, 71% were successfully recontacted for Pathways and 87% of them agreed to participate in the telephone interview). Then, 75% of them returned the mailed questionnaire. More information about both Pathways and the NS-CSHCN, including the consent procedures, can be found at http://www.cdc.gov/nchs/slaits.htm.

Child demographics included child's age, sex, race, ethnicity, and current health insurance coverage. Household characteristics included age of mother at child's birth, highest education level in the household, family structure, number of children in the household, family income (recoded as a percentage of the federal poverty level based on the number of household members), housing status, and residence in metropolitan statistical area (federally defined core urban geographic areas). Demographic and socioeconomic characteristics of the child and family were obtained either at the time of the Pathways survey or were drawn from the NS-CSHCN.

Parents were asked if their child had wandered off or become lost from each of 4 locations (home; someone else's home; school, daycare, or camp; or from a store or other public place) in the past year (Table I; available at www.jpeds.com). In addition, parents were asked if they had done anything, such as added fences, gates, or other barriers to prevent their child from wandering off, and if the child wore a tracking device to help locate them within the past year.

Parents were asked a series of questions regarding their child's current functional strengths and difficulties in the areas of self-care (goes to the bathroom; feeds self; dresses by him/herself) and social communication (asks for things he/she needs or wants; provides name, address, and phone number, if asked; spends times with friends). Additional questions were contained in the mailed questionnaire (n = 1596). Parents were asked about their child's emotional, behavioral, or developmental status in the past 6 months based on the Strengths and Difficulties Questionnaire, a validated assessment used in other national surveys.[26] Parents also provided information on the length, burden, and impact of their child's emotional and behavioral difficulties ("Do the difficulties interfere with your child's every life in the following areas?". "home life," "friendships," "classroom learning," and "leisure activities." Responses were dichotomized into "quite a lot" or "a great deal" and "not at all" or "only a little."

Statistical Analyses

Report of wandering status, prevention techniques, and demographic differences between diagnostic groups (ASD without intellectual disability, ASD with intellectual disability, and intellectual disability without ASD) were analyzed utilizing corrected χ^2 tests or bivariate logistic regressions that accounted for the survey design. All estimates were calculated using statistical software that accounted for the complex sample design of the survey. Two series of multivariate logistic regressions were used to determine potential predictors of wandering among children within each diagnostic group. The first series examined child and household demographics, and the second series examined functional impacts, current psychiatric conditions, and functional skill limitations within each diagnostic group. All regressions were adjusted by demographic factors. All analyses were completed in Stata v 12.0 (StataCorp, College Station, Texas); missing data for household income were multiply imputed and provided by NCHS.

Results

Table II displays demographic characteristics of the sample for the 3 diagnostic groups. Overall, children with ASD with and without intellectual disability were more likely to be male than those with intellectual disability without ASD. Children with ASD without intellectual disability were younger than children with intellectual disability without ASD, and were more likely to live in households with 2 parents, above the 200% federal poverty level, and with the highest educated member having attended more than high school. Children with intellectual disability without ASD were more likely to have public insurance than children with ASD without intellectual disability.

Wandering in Past Year

Reported wandering or becoming lost within the past year was highest among children with ASD with intellectual disability (37.7%) followed by children with ASD without intellectual disability (32.7%), and then children with intellectual disability without ASD (23.7%) (Figure 1). Children with ASD with and without intellectual disability had the highest rates of wandering from a store or other public place (22.9% and 24.7%, respectively); children with ASD without intellectual disability were more likely to wander from a store or public place than children with intellectual disability without ASD (11.9%).

Demographic Predictors of Wandering

Multivariate models indicated that younger children (6-11 years old) diagnosed with ASD without intellectual disability (OR 2.23, 95% CI 1.32-3.74; $P < .01$) as well as younger children diagnosed with intellectual disability without ASD (OR 3.30, 95% CI 1.73-6.29; $P < .001$) were more likely to have wandered in the previous year than their older counterparts (12-17 years old) with the same diagnosis. Children diagnosed with ASD without intellectual disability with private insurance (OR 0.29, 95% CI 0.10-0.84; $P < .05$) or public insurance (OR 0.25, 95% CI 0.08-0.78; $P < .05$) were less likely to wander compared with children with ASD without intellectual disability with no insurance. Finally, male children diagnosed with ASD and intellectual disability (OR 2.79, 95% CI 1.03-7.57; $P < .05$) were more likely to wander than their female counterparts.

Clinical and Functional Predictors of Wandering

Figure 2 (available at www.jpeds.com) presents aORs for the presence of functional skill limitations and functional impacts by wandering status. Children with ASD without intellectual disability (OR 1.79, 95% CI 1.05-3.05; $P < .05$) and children with intellectual disability without ASD (OR 3.27, 95% CI 1.17-9.14; $P < .05$) who were reported to wander had more limitations in social and communication skills than did nonwanderers. In addition, children with ASD without intellectual disability who wandered also had more limited self-care skills (OR 2.47, 95% CI 1.43-4.25; $P < .01$) than nonwanderers.

Children with ASD without intellectual disability (OR 2.05, 95% CI 1.01-4.16; $P < .05$) and intellectual disability without ASD (OR 2.92, 95% CI 1.33-6.38; $P < .05$) who wandered were more likely to have emotional or behavioral problems during the past 6 months than nonwanderers. Among children with ASD without intellectual disability, children who wandered were more likely to be upset by their difficulties, to have difficulties that interfered with friendships and in the classroom, and to place a higher reported burden on the family. Children with intellectual disability without ASD who wandered shared these functional impacts and additionally had emotional or behavioral problems that interfered with their leisure activities and home life. Impact and burden did not vary among wanderers and nonwanderers with ASD with intellectual disability.

Table III presents aORs for wandering by the presence of current psychiatric conditions. Children diagnosed with intellectual disability without ASD were more likely to wander if they were also diagnosed with ADHD (OR 2.12, 95% CI 1.12-4.00; $P < .05$), depression (OR 3.63, 95% CI 1.48-8.90; $P < .01$), anxiety problems (OR 3.45, 95% CI 1.67-7.12; $P < .01$), or conduct or behavioral problems (OR 2.54, 95% CI 1.23-5.23; $P < .05$) compared with children without these disorders (Table IV; available at www.jpeds.com).

Preventive Measures of the Population

Children with ASD with intellectual disability had parents who reported the highest use of prevention measures (40.8%), compared with approximately 1 in 4 of children with ASD without intellectual disability or intellectual disability without ASD. Reported use of tracking devices was low among all diagnostic groups (between 2.4% and 3.5%); these estimates should be considered with caution given the low sample size.

Discussion

Wandering or becoming lost within the past year was reported by parents of between 24% and 38% of children with special healthcare needs diagnosed with ASD, intellectual disability, or both. Reported wandering or becoming lost within the past year was highest among children with ASD with intellectual disability, followed by children with ASD without intellectual disability, and then children with intellectual disability without ASD, although group differences were not significantly different. This study affirms that wandering among children with ASD, regardless of intellectual disability status, is relatively common, reported in about 1 in 3 children with ASD. Recent family and community awareness of wandering has focused on children with ASD. However, wandering or becoming lost in the past year was also reported for almost 1 in 4 children with intellectual disability, indicating the need to broaden concern about this safety issue to children with other developmental disabilities.

In the only other large study to evaluate the occurrence of wandering among children with ASD, parents reported that 49% of children ages 4-17 years with ASD and 13% of siblings of children with ASD had ever attempted to wander off or elope after the age of 4 years. Reported wandering behavior was nearly nonexistent at only 1% by the time siblings without ASD were between the ages of 8-11 years (compared with reported wandering among 27% of the 8- to 11-year-olds with ASD).[7] Differences in methodology likely contributed to the higher estimates from that report, the Interactive Autism Network (IAN) study. The IAN study was an internet-based survey targeting families of children with ASD who had voluntarily signed up to be part of the IAN research project. Families were sampled and a survey specific to wandering was sent out for completion. Although this study provided a complete and large descriptive dataset on wandering, sampling bias toward families of children with ASD concerned with wandering was possible. In the present study, the parents of a large national, probability-based sample of children with special healthcare needs were recontacted, and asked a broader range of survey questions on diagnosis, functioning, and services, limiting the bias toward participation attributable to concern specific to wandering. In addition, the IAN study asked if the child had ever wandered or eloped after the age of 4 years compared with the current study that framed the question more specifically to wandering off or becoming lost in the past year, potentially reducing the influence of recall bias.

Despite the differences in methodology that likely contributed to the lower reports of wandering in the present study, many similarities exist between the findings of the 2 studies, including limited predictors of wandering based on demographics and other diagnosed psychiatric conditions for children with ASD. Similar to the IAN study, diagnosed co-occurring conditions such as depression, anxiety, and ADHD did not predict wandering status for children with ASD in either group; however, these conditions were more likely among children with intellectual disability without ASD who were reported wanderers. Different from the IAN study, the present analysis did provide additional findings: reported wanderers were more likely to be younger if the child was in the ASD without intellectual disability group or the intellectual disability without ASD group, and more likely to be male in the ASD with intellectual disability group. Only children with ASD without intellectual disability who lacked health insurance were more likely to wander than those with health insurance, the significance of which is unclear.

Clinicians and interventionists have been challenged to identify a meaningful way to measure functional impact of ASD, and intellectual disability is sometimes used as a proxy for level of disability severity and an indicator of more “classic” autism.[27,28] However, among children who wander, global diagnoses of intellectual disability or other specific co-occurring conditions were not good predictors of wandering. Instead, more specific information on adaptive skills and functional difficulties were more telling. Children with ASD without intellectual disability or intellectual disability without ASD who wandered were more likely to have had emotional or behavioral difficulties reported in the past 6 months than their respective nonwanderers. In addition, among the children with ASD without intellectual disability, wandering status was associated with greater challenges in social communication and self-care skills, suggesting an association between wandering and increased impairments in adaptive functioning for this group that is sometimes referred to as “high-functioning.” In addition, parents rated the burden of difficulties of children who wandered with ASD without intellectual disability or with intellectual disability without ASD higher than those who did not wander. Wandering was not associated with burden ratings among children with both ASD and intellectual disability, potentially because having both conditions places even greater challenges on caregivers than having either condition alone. Future studies will need to explore more deeply the specific characteristics and triggers related to wandering. Currently, most data on wandering are from older adults with dementia,[29] and given children with ASD or intellectual disability can share weaknesses in reasoning, awareness of surroundings, and ability to communicate, there is a need for further exploration of key predictors of wandering.

Other reports and studies indicate the challenges associated with having a child with a developmental disability are even greater when there is risk of the child wandering off.[6,14] Parental worry about keeping their child safe has an impact on the parent and family's functioning including interrupted sleep, fear of perception of poor parenting, worry about the child being harmed or killed because of leaving a safe space, and inability to find support.[14,30,31] Families and other caregivers, such as teachers and camp counselors, face major challenges keeping children at risk for wandering safe in open areas, including limiting the child's ability to travel outside a safe, small zone such as a locked house or classroom. The results of this survey indicate that even though the use of prevention measures for wandering are relatively common (26%-41%), details on what was done, the timing, and whether the measures were effective are lacking. In this study, the use of tracking devices was rare for all groups, but despite ethical concerns of balancing safety and privacy, increasing availability of technology to locate children might increase the use of these devices for individuals who are likely to go missing.[32,33]

This study has several strengths, including the use of a large population-based national sample of children with special healthcare needs having ASD and/or intellectual disability. The survey also included broader questions on diagnoses, functioning, and services, reducing the likelihood that care-givers concerned specifically with wandering would respond. Despite these strengths, the results also must be considered in light of several limitations. ASD and intellectual disability status were based on a caregiver report of a current diagnosis from a healthcare provider. Response bias was still possible given incomplete participation, although estimates were weighted to correct for response biases. This survey was cross-sectional and did not allow for comparisons of children over time. The limited scope of the questions on wandering leave many unanswered questions, such as the circumstances surrounding wandering incidents, potential motivation for the child, and details on the use and timing of prevention and tracking techniques. Finally, there was no general population control group to gauge how common wandering may be if these survey questions were asked for children who are not developmentally delayed; however, a study of siblings of children with ASD indicate that wandering behavior is most likely to occur in the early years before the age of 8 and to be very rare (1%) between 8 and 11 years.[7]

Overall, this study provides further support for the importance of understanding predictors of wandering behavior among children with ASD and/or intellectual disability. The potential to leave a safe area and end up in harm's way is relatively common among children with ASD and/or intellectual disability. Families and caregivers face significant stress and challenges in trying to keep their children safe. Valid screening tools, prevention techniques, and intervention plans could contribute to the well-being of these individuals and their families.

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Glossary

ADHD	Attention-deficit hyperactivity disorder
ASD	Autism spectrum disorder
IAN	Interactive Autism Network
NCHS	National Center for Health Statistics
NS-CSHCN	National Survey of Children with Special Health Care Needs

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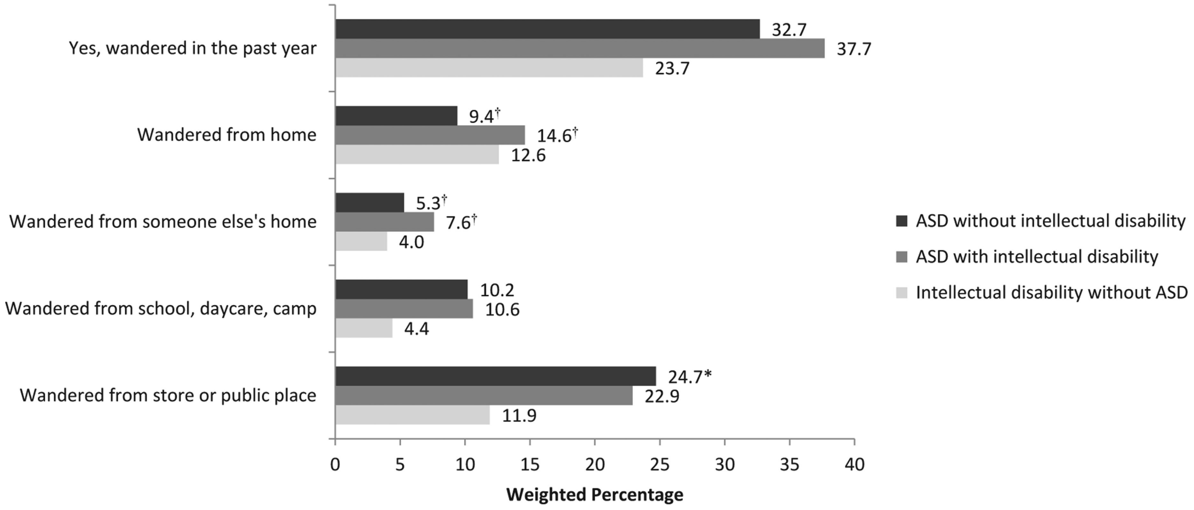

Figure 1.

Reported percent wandering among children with special healthcare needs, by current report of an ASD, with and without intellectual disability and intellectual disability without ASD. $^*P < .05$ for comparison of children with intellectual disability without ASD and children with ASD without intellectual disability. †Estimates have a relative SE 30% or greater and may be unreliable.

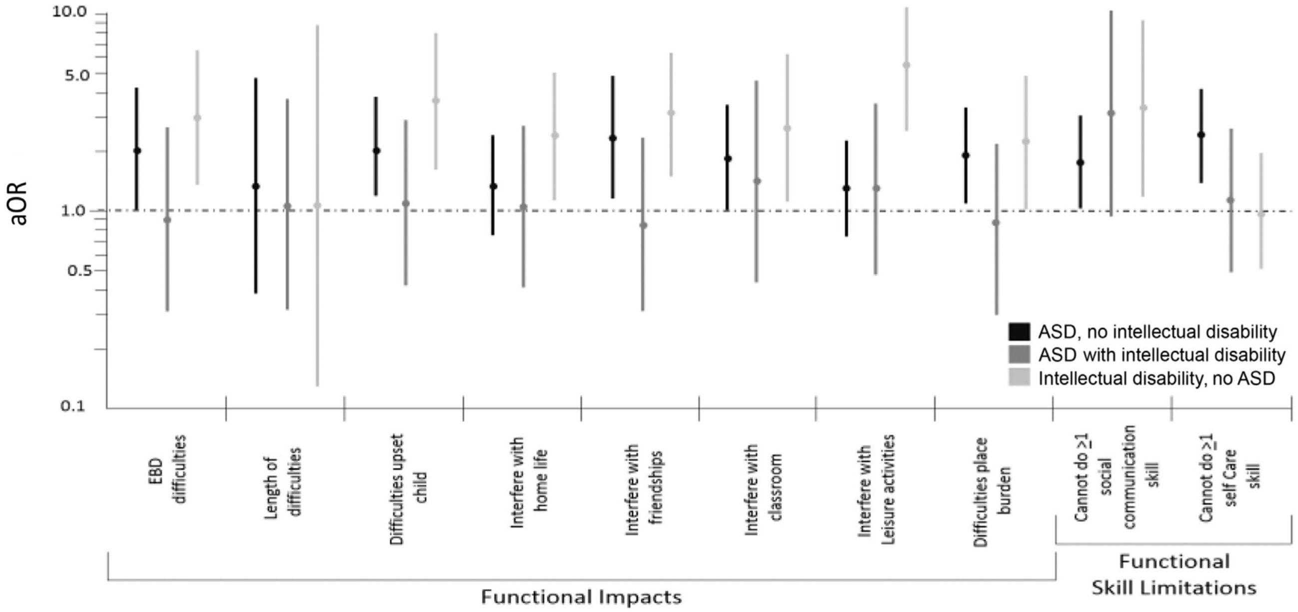

Figure 2.

aORs of wandering by functional impact or functional skill limitation, subdivided into diagnostic subtypes. Notes: aORs include all demographics reported in Table II. “EBD difficulties” were defined by a parent reporting his/her child had definite or severe emotional, behavioral, or developmental disabilities. “Self-care skills” included going to the bathroom, feeding oneself, and dressing oneself. Individual functional skills were rated by parents as “can do this by him/herself, can do with help, cannot do, or never tried”. *ASD*, autism spectrum disorder; *ID*, intellectual disability; *EBD*, emotional, behavioral, or developmental disorders.

Table I

NS-CSHCN pathways questions on wandering

1. Within the past year, has [Child] wandered off or became lost from
    a. your home?
    b. someone else's home such as a relative, friend, neighbor, or babysitter?
    c. school, day care, or summer camp?
    d. a store, restaurant, playground, campsite, or any other public place?
2. Have you added fences, gates, locks, alarms, or other barriers to your home in an effort to prevent [Child] from wandering off or becoming lost?
3. Within the past year, has [Child] worn a tracking device to help you find [him/her] if [he/she] wandered off?

Table II

Percent distribution of demographic characteristics by current report of an ASD, with and without intellectual disability, and intellectual disability without ASD

Characteristics	Total (n = 2077)	ASD without intellectual disability (n = 1117) (A)	ASD with intellectual disability (n = 303) (B)	Intellectual disability without ASD (n = 657) (C)
Age				
6-11 y	50.6	56.4[*]	48.7	42.0
12-17 y	49.4	43.6[*]	51.3	58.0
Sex				
Female	27.8	17.4[*]	19.5[*]	48.6
Male	72.2	82.6[*]	80.5[*]	51.4
Race/ethnicity				
Non-Hispanic white	63.5	69.3	55.8	57.9
Non-Hispanic black	13.3	11.0	9.6	18.7
Non-Hispanic other	10.8	8.6	15.1	12.4[†]
Hispanic	12.4	11.1	19.5	11.0
Age of mother at child's birth				
<30 y	47.1	46.8	43.3	49.3
30+ y	52.9	53.2	56.7	50.7
Highest education in household				
High school or less	26.2	21.0[*]	31.0	32.4
More than high school	73.8	79.0[*]	69.0	67.6
Family structure				
Single mother or other	34.0	28.2[*]	33.7	43.7
2 parents, bio, adopt, step	66.0	71.8[*]	66.3	56.3
Children in household				
1	24.0	23.2	27.4	23.8
2	39.6	43.9	29.2	37.4
≥3	36.4	32.9	43.4	38.8
Family income				
<200% FPL	40.6	35.4	41.7	48.6
≥200% FPL	59.4	64.6[*]	58.3	51.4
Housing				
Rent/other arrangement	34.7	32.9	27.8	40.8
Own	65.3	67.1	72.2	59.2
MSA status				
Non-MSA	19.9	20.0	14.6	22.5
MSA	80.1	80.0	85.4	77.5
Child's health insurance				

Characteristics	**Total (n = 2077)**	**ASD without intellectual disability (n = 1117) (A)**	**ASD with intellectual disability (n = 303) (B)**	**Intellectual disability without ASD (n = 657) (C)**
None	2.4	2.7	1.3[†]	2.6[†]
Private/employment based	61.8	68.0[*]	63.5	50.9
Public	35.8	29.3[*]	35.2	46.5

FPL, federal poverty level; *MSA*, metropolitan statistical area.

[*] Percentage differs significantly from the percentage of children with intellectual disability without ASD ($P < .05$).

[†] Estimates have a relative SE 30% or greater and may be unreliable.

Table III

Proportion of children who wander by demographic characteristics, with aORs for wandering, stratified by diagnostic subtype

	ASD without intellectual disability		ASD with intellectual disability		Intellectual disability, no ASD	
Characteristics	**%**	**95% CI**	**%**	**95% CI**	**%**	**95% CI**
Age						
6-11 y	40.8	**2.23 (1.32-3.74)**	41.2	1.47(0.64-3.37)	35.9	**3.30 (1.73-6.29)**
12-17 y	22.3	Reference	34.2	Reference	14.9	Reference
Sex						
Female	28.0	Reference	23.5	Reference	19.1	Reference
Male	33.7	1.31 (0.62-2.77)	41.1	**2.79 (1.03-7.57)**	28.0[*]	1.24 (0.64-2.38)
Race/ethnicity						
Non-Hispanic white	31.9	Reference	40.7	Reference	18.5	Reference
Non-Hispanic black	37.2	0.84 (0.31-2.25)	18.2[*]	0.34 (0.05-2.17)	23.2[*]	1.19 (0.39-3.65)
Non-Hispanic other	18.8[*]	0.42 (0.16-1.13)	43.5[*]	0.83 (0.22-3.13)	56.6[*]	2.69 (0.83-8.78)
Hispanic	46.8	1.65 (0.74-3.66)	34.7[*]	0.91 (0.26-3.15)	13.5[*]	0.53 (0.18-1.57)
Age of mother at child's birth						
<30 y	37.4	Reference	44.0	Reference	18.0	Reference
30+ y	28.9	0.75 (0.46-1.23)	36.8	0.60 (0.26-1.37)	29.6[*]	1.39 (0.67-2.85)
Highest education in household						
High school or less	43.2	Reference	42.4	Reference	16.6	Reference
More than high school	29.9	0.55 (0.29-1.06)	35.9	0.52 (0.17-1.55)	27.2	2.26 (0.94-5.41)
Family structure						
Single mother or other	33.9	Reference	25.8	Reference	30.1[*]	Reference
2 parents, bio, adopt, step	32.1	0.85 (0.45-1.59)	43.2	1.24(0.45-3.41)	9.1	0.82 (0.39-1.69)
Children in household						
1	24.8	Reference	34.5	Reference	21.4	Reference
2	32.6	1.56 (0.81-3.02)	27.4	0.74 (0.27-2.01)	29.5[*]	0.84 (0.34-2.05)
≥3	38.5	1.72 (0.86-3.41)	46.3	2.24 (0.90-5.61)	19.5	0.72 (0.30-1.77)
Family income						
<200% FPL	35.2	Reference	27.7	Reference	20.2	Reference
≥200% FPL	31.0	1.09 (0.53-2.24)	40.1	2.18 (0.72-6.62)	27.0[*]	0.96 (0.41-2.25)
Housing						
Rent	40.6	Reference	27.8	Reference	29.1[*]	Reference
Own	29.0	0.60 (0.32-1.11)	41.7	2.17 (0.74-6.35)	19.9	0.72 (0.32-1.61)
MSA status						
Non-MSA	32.3	Reference	31.8	Reference	17.4	Reference
MSA	32.8	1.26 (0.68-2.31)	38.7	1.81 (0.67-4.91)	25.5	0.88 (0.42-1.87)
Health insurance						

	ASD without intellectual disability		ASD with intellectual disability		Intellectual disability, no ASD	
Characteristics	**%**	**95% CI**	**%**	**95% CI**	**%**	**95% CI**
Uninsured	55.7	Reference	45.7[*]	Reference	12.1[*]	Reference
Private	31.8	**0.29 (0.10-0.84)**	37.3	0.36 (0.04-3.14)	18.9	1.10 (0.18-6.77)
Public	33.0	**0.25 (0.08-0.78)**	38.0	0.89 (0.11-7.32)	29.9[*]	1.41 (0.23-8.75)

Notes: aORs include all demographics reported in **Table II**.

Bolded aORs are significant at $P < .05$.

[*] Estimates have a relative SE 30% or greater and may be unreliable.

Table IV

Proportion of children with and without current psychiatric conditions who wander, with aORs for wandering, stratified by diagnostic subtype

	ASD without intellectual disability		ASD with intellectual disability		Intellectual disability, no ASD	
Current psychiatric conditions	**%**	**95% CI**	**%**	**95% CI**	**%**	**95% CI**
ADHD	35.4	1.24 (0.74-2.08)	44.4	1.37 (0.62-3.03)	35.0	**2.12 (1.12-4.00)**
No ADHD	30.2	Reference	29.7	Reference	15.5	
Depression	40.9	1.70 (0.87-3.35)	38.0[*]	1.29 (0.46-3.63)	32.7	**3.63 (1.48-8.90)**
No depression	30.8	Reference	37.6	Reference	22.1	
Anxiety problems	31.0	1.00 (0.61-1.66)	42.7	1.37 (0.59-3.17)	33.0	**3.45 (1.67-7.12)**
No anxiety problems	34.0	Reference	33.0	Reference	20.4[*]	
Conduct behavioral problems	36.2	1.00 (0.59-1.70)	49.4	2.25 (0.98-5.14)	29.8	**2.54 (1.23-5.23)**
No conduct behavioral problems	31.3	Reference	29.0	Reference	22.0	

Notes: aORs include all demographics reported in **Table II**.

Bolded aORs are significant at $P < .05$.

[*] Estimates have a relative SE 30% or greater and may be unreliable.