**Parents’ and Teachers’ Perceptions of the Transportation Experiences of Youth with Intellectual and Developmental Disabilities**

# Abstract

Enhancing transportation skills is crucial in promoting the quality of life for youth with IDD. To learn about the experiences of Chinese youth with IDD’s transportation skills development and improve the transportation experiences of youth with IDD in China, exploratory research was conducted. In-depth interviews with key stakeholders of transition-age individuals with IDD (i.e., 23 teachers and 19 parents) from five major cities in China were carried out, to explore the transportation experiences of youth with IDD through parents’ and teachers’ perspectives. Adopting the constructivist grounded theory method, three main themes were formed: the need to develop transportation skills, the practices for supporting transportation, and the challenges of transportation. The findings ascertain the importance of travel training to promote community inclusion of transition-age youth with IDD and disclose the helpful practices for improving youth’s transportation skills and the existing barriers. Limitations and implications for research, policies, and practice are also described.

*Keywords:*transportation skills, intellectual and developmental disabilities, parent, teacher, interview

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Transportation refers to the movement of people from place to place and the various ways such movement is accomplished, and it is critical for the quality of life of all people, including those with intellectual and developmental disabilities (IDD). It allows people to access a wide range of services and participate in social life, including education, employment, healthcare, social activities, leisure, and recreational activities (Bezyak et al., 2017; Jansuwan et al., 2013) and significantly improves social participation and independence (Bascom & Christensen, 2017). IDD refers to a group of lifelong developmental conditions characterized by significant impairment of intellectual functioning and adaptive behaviors that are usually present in childhood, such as intellectual disability, Down Syndrome, autism spectrum disorder, and cerebral palsy (National Institutes of Health, 2021). People with IDD acknowledge the importance of being able to transport independently in all aspects of life (Falkmer et al., 2015). Moreover, mastering transportation knowledge and skills predicts a successful transition to adult life (Mazzotti et al., 2016).

However, transportation is often challenging for individuals with IDD (Bross et al., 2023). According to a U.S. Department of Transportation survey, over half of those who never leave their homes (1.9 million) are people with disabilities (U.S. Department of Transportation, 2017). Existing literature also demonstrated that many people with IDD depend on others for transportation (Palisano et al., 2009). Although adults with IDD express great interest in accessing a motor vehicle, many rely on personal vehicles driven by their guardians or public transportation rather than driving (Feeley et al., 2015; Penfold, et al., 2008). For example, Feeley et al.’s (2015) survey found that only 9.3% of autistic participants in New Jersey have a driver’s license, and merely 23.9% of those drove daily. Many participants also reported being worried about handling potential accidents while driving. Several Chinese researchers have found that individuals with IDD have disappointingly poor transportation skills. For example, Wan et al. (2015) showed that more than 60% of student participants with IDD needed their parents’ guidance when crossing the road or taking public transportation, impeding their access to healthcare services, education, and employment opportunities and community inclusion (National Council on Disability, 2015; Pfeiffer et al., 2020). The characteristics associated with IDD could inhibit people’s independent transportation. Specifically, cognitive-processing skills, like time management, literacy, problem-solving, and attention span requirements, are essential for using public transportation (Davies et al., 2010).

In addition to the individual factors, social factors (physical environment and social attitudes) also greatly influence the transportation experiences of individuals with IDD. Although many countries have signed the Convention on the Rights of Persons with Disabilities (United Nations, 2006), which highlights the importance of people with disabilities’ accessibility and mobility, problems and barriers to transportation and related services persist worldwide. For example, the U.S. Department of Transportation (2017) suggested that many people with disabilities struggle to get necessary transportation. Several studies have revealed that environmental factors can affect accessibility and especially problems related to public transportation, such as complex transportation schedules, insufficient visual or auditory cues, route complexity, frequent transfer requirements, unavailable pedestrian environment, wheelchair securement, and inoperable lifts and ramps (Bezyak et al., 2023; Lubin & Deka, 2012; Risser et al., 2015). Furthermore, the support from and attitudes of community members and the public also could influence people with IDD’s transportation experience. For example, a German study found that bus drivers could be a strong part of the social network supporting people with IDD’s use of public transportation (Tillmann et al., 2013). However, inappropriate driver attitudes such as feeling insecurities when interacting with people with IDD and describing passengers with IDD as “difficult passengers” (p. 310) and reluctant to transport them (Tillmann et al., 2013), and lack of support were identified as significant barriers by people with disabilities (Bezyak et al., 2017), and drivers’ lack of respect and discriminatory practices reduced people with IDD’s confidence levels (Alanazi, 2022). In addition, many Chilean drivers hold negative attitudes toward people with IDD (Calle et al., 2022).

Encouragingly, solutions are being explored to support people with IDD to overcome transportation barriers. According to one recent study in the U.S., some people with disabilities have received transit services from vocational rehabilitation programs, leading to better employment outcomes (Bezyak et al., 2023). Moreover, many strategies have been verified to contribute to developing the travel skills of people with IDD. Face-to-face travel training and instruction in real or simulated environments using visual, audio, or video prompts, role play, and task analysis has been identified as helpful (Batu et al., 2004; Mechling & O’Brien, 2010; Pfeiffer et al., 2020). Several people with IDD have acquired basic driving skills and show the potential to obtain driver’s licenses through simulation-based driver training (Randall et al., 2021). Rapid technological development has led to many emerging technologies being adopted in transportation training; for example, combining digital games and virtual reality technologies to support transportation training for people with IDD is a growing trend (Arnab et al., 2013; Cano et al., 2018; Chang et al., 2016; Simões et al., 2018). The findings of these studies suggest that applying these technologies can help people with IDD become more independent when traveling outside, specifically taking public transportation. Additionally, the use of smartphone applications (apps) coupled with Global Positioning System (GPS) technology has promise for supporting people with IDD’s independent transportation (Davies et al., 2010). GPS-based apps for transportation have numerous benefits for people with IDD, not only because they are free and easily available (Alanazi, 2022) but also because their strong navigation functions could alleviate people with IDD’s cognitive load (McMahon et al., 2015). Previous research suggests that by using map apps, individuals with IDD could travel independently and generalize travel skills faster in exploring new locations (Stock, et al., 2013).

Although the urban public transportation network in China is well-developed, people in most cities, especially in medium and large cities, have access to public transportation such as buses, subways, taxis, and trains. However, the transportation challenges for Chinese youth with IDD are similar to other countries mentioned above (Xu, 2022). The Chinese government has formulated a series of documents emphasizing that people with disabilities should have equal rights to access the public environment and fully participate in social activities (e.g., State Council, 2012), however, people with disabilities generally do not receive such transportation services and accessible infrastructures (Ren et al., 2018). At over 82.96 million, China has one of the world’s largest populations of people with disabilities, of which there are more than 11.68 million people with IDD (China Source, 2016) and must meet their transportation demands. According to Chinese researchers, students with IDD did not make full use of transportation facilities and relied heavily on guardians to travel (Wan et al, 2015).

It is worth noting that, unlike in developed countries, youth with IDD usually receive another three to four years of education and support in special education schools or regular vocational training schools after completing the 9-year compulsory education. Although more and more government and non-government organizations have started to provide school-to-adulthood transition services for youth with IDD, post-school transition services in China are still in the early stage of development (Xu et al., 2014) and most of these services are school-based or school-led. Even though, transportation skills training is often listed as an important component of transition services that facilitate individuals’ independent living and community participation (Zou, 2023). Nevertheless, the understanding of the transportation needs and related supporting practices for Chinese youth with IDD is insufficient. Therefore, a better understanding of the transportation experiences of youth with IDD will contribute to closing the research gap in China and offering empirical evidence for the design and improvement of transition services for transition-age youth with IDD. As the participation and partnership of parents and teachers directly affect the youth’s transition experience (Nolan et al., 2010), understanding the involvement of parents and teachers of youth with IDD to provide transportation support is crucial (Bross et al., 2023; Leonard et al., 2016). Therefore, this study aimed to gain a more thorough understanding of the development of transportation skills for Chinese youth with IDD by collecting the views of parents and teachers. This study was exploratory and was guided by the following two research questions:

1. How did parents and teachers view transportation skills for youth with IDD?

2. What do youth with IDD commonly experience during transportation skills development?

# Method

This research was approved by the Institutional Review Committee of the authors’ University before participant recruitment and data collection. Given that this topic is yet under-researched, the present study is exploratory in nature and the researchers made no theoretical assumptions, therefore the grounded theory approach was adopted (Charmaz, 2014). The author team organized routine meetings to develop a detailed research plan, with clear roles and responsibilities of each author being articulated.

## Participants

Interviews were conducted with 23 special education teachers in secondary or vocational schools and 19 parents of youth with IDD in five cities in different areas of China: Beijing, Hangzhou, Changsha, Chengdu, and Shenzhen, which represents northern, eastern, central, western, and southern regions of China, respectively. The public transportation systems in these cities are relatively complete, including buses, subways, taxis, and trains, and the public transport routes almost cover the whole city. Furthermore, these cities highlighted the accessibility of public transportation for people with disabilities. The first author contacted the directors of local special schools and social organizations with over five years of experience in offering transition services to young people with disabilities in the above cities by phone or email, inviting the directors to help us recruit teacher and parent volunteers. Per the study’s purpose and feasibility, parents were recruited based on the following criteria: (1) they were primary caregivers of youth with IDD; (2) they voluntarily participated in the interview and had a strong willingness to communicate; and (3) their children had received or were receiving transition services. The demographic information for parents is shown in Table 1. The inclusion criteria of teachers were: (1) they had worked with youth with IDD for one year or more in school-based transition services; and (2) they had volunteered to participate in interviews and were strongly willing to communicate. The demographic information for teachers is shown in Table 2.

## Data Collection

We developed an interview protocol based on the research questions. We invited an IDD, transition, and qualitative research expert to review our initial interview questions and provide feedback. We also used a teacher and a parent as separate pilots. This process involved asking participants if any questions were confusing or should be modified. We focused our interviews on the following questions: (a) What is your attitude toward developing transportation skills of youth with IDD? (b) How do you develop transportation skills of youth with IDD? and (c) What problems do you have in developing transportation skills of youth with IDD?

Interviews were mainly conducted face-to-face and one-by-one, with only two parents and three teachers being interviewed by telephone. Before the interview began, the main interviewer informed participants of the interview’s purpose and expected duration, discussed the principles of confidentiality and unconditional withdrawal, invited participants to sign an informed consent form, and obtained their permission to record the entire interview. During the interview, interviewers paid close attention to what the participant was saying, gave feedback when necessary, and noted key information, important facial expressions, and body language. The interviewer followed up whenever conceptual or ambiguous statements emerged during the interview and respected the right of participants to express themselves when they began to make off-topic statements, only directing them back to the target topic when the time was right. Interviews ranged from 15 to 57 min, with an average interview duration of 34 minutes. During the interviews, interview reflection logs were penciled.

## Data Analysis

The first two authors conducted interviews in four cities, and the third author completed interviews in the other city. After completing all the interviews, the second author applied the Chinese voice recognition software Iflytec®, specializing in intelligent speech recognition (Li et al., 2019), to transcribe. Four postgraduate students majoring in special education, with experience in interviews and coding, were invited to verbatim proofread the transcripts. With discussions among the second author and the four postgraduate students to resolve any disagreements, the team ultimately achieved consensus on all the transcripts. At the same time, the researchers deidentified participants’ information to ensure anonymity. Once the transcripts had been proofread, the first two authors read through them to build familiarity with and sensitivity to the data.

The research team employed the components of constructivist grounded theory methods (Charmaz, 2014) to allow the themes to emerge naturally. The data analysis included the following three steps: initial coding, focused coding, and axial coding. In the initial coding phase, the first and second authors developed the initial code by carefully reading all the transcripts, allowing the code to emerge from the data rather than applying pre-determined categories.

In order to make the initial code more directed, selective, and conceptual, a focused coding technique was then applied. The first and second authors developed the focused code by reading interview texts, reviewing all the initial code and memos written during the initial coding process, and classifying the initial code. The first and second authors discussed and determined whether the focused codes adequately reflected the data, and created a codebook with about 80 focused codes and definitions. The second author used this codebook to encode all transcripts in NVivo 12.0.

After completing the aforementioned two steps, axial coding was conducted. Through additional analysis of the focused code, the first and second authors reviewed all memos, classified the focused codes and formed themes, and initially identified 12 sub-themes. At this stage, the third and fourth authors were invited to join the discussion process. They read 35% of transcripts and memos, confirmed that the data supported the established themes and sub-themes, and identified several areas worthy of further examination based on the research questions. Through the consensus dialogue, all authors agreed to refine the 12 sub-themes into nine sub-themes and classify the nine sub-themes into three main themes. Finally, the fourth author translated all codes, themes and references from Chinese to English and discussed the accuracy of the translation with other authors until all authors reached a consensus.

Evidence from multiple sources and the involvement of several researchers strengthened the trustworthiness of the findings (Carter et al., 2014). Additionally, considering the features of qualitative research, we recognized that our data collection and analysis may be unintentionally influenced by our positionalities as researchers, which also ranged in authors’ involvement in the research. For example, the third author has 10 years of experience in teaching students with IDD, including teaching transportation skills, and other authors are familiar with Chinese transition services and we supposed that participants should receive enough individualized training, while we acknowledged that we lack rich understanding of what people with IDD actually experienced in their transportation. Therefore, we committed to identifying and addressing these potential biases through keeping reflection logs, reviewing analysis memos and arranging regular discussion sessions.

# Results

We categorized participants’ experiences and perspectives on youth with IDD’s transportation into three major themes: the need to develop transportation skills, the practices for supporting transportation, and the challenges of transportation. Within each theme, we present sub-themes with participants’ quotes.

## The Need to Develop Transportation Skills

Both parents and teachers recognized the need to support transition-age youth with IDD to acquire transportation skills, which are important for the survival and growth of young people with IDD at transition age. Enhancing independence, achieving employment, and improving the quality of life were frequently mentioned as benefits throughout interviews.

### Enhancing Personal Independence

All participants acknowledged the value of travel skills for youth with IDD in their daily lives, especially for developing independence. For example, one teacher noted, “Travel skills allow them to go out without being accompanied … they can go wherever they want (CS-T-2).” At the same time, some teachers and parents agreed that transportation training is an important means of strengthening abilities and skills associated with the self-determination of transition-age youth with IDD, because youths need to decide their destinations and routes and learn to solve problems when meeting unexpected situations during the journey, such as “the temporary closure of subway stations” and “missing the stop.” One parent rejoiced at the positive changes in her son’s daily life: “He was excited, very motivated and looked confident because he could make the decision by himself (BJ-P-1).” One teacher also talked about how travel alone may influence transition-age youth with IDD’s confidence of self-determination: “If he could take public transportation to a further place and meet different people … it will improve his confidence, self-determination, and other abilities (SZ-T-1).” For example, one parent pointed out that the opportunity for independent travel enables more potential for young people. As one parent said:

I once unintentionally mentioned that if we miss our station on the subway, we can go to the opposite platform and take the same line back. My child took the subway and missed the station the other day; after he traveled a few stations further, he realized that he might be in the wrong direction, so he got off the subway and went to the opposite platform and took another subway back, and finally arrive at the destination. This surprised me (CS-P-4).

### A Prerequisite for Employment

Most participants expressed that travel skills are essential prerequisites for employment. As one parent claimed: “Just like you have to eat and sleep … if you want to seek a job, you have to have the ability to travel independently first (CD-P-3).” Transition-age youth with IDD’s poor travel skills might make a bad impression on employers and negatively influence their ability to find and keep a job; as one teacher explained,

Especially those who need parents’ long-term pick-ups and drop-offs … it will definitely have a bad impact on the employer, the impression may be that the child’s daily living skills or work abilities are insufficient, or the parents are overly indulgent (HZ-T-3).

Additionally, some specific jobs are closely linked with travel skills, and employees must have a good sense of space or the ability to plan routes. For example, “being a delivery guy, he needs to know how to plan the routes cleverly (BJ-T-1).” There also was an example in the workplace: “The staff only in hotels usually are very complex, if youths are not familiar with the map or do not have the ability to plan the routes, they may not even be able to find the entrance (SZ-T-6).”

### Improving Quality of Life

Teachers and parents highlighted the connection between transportation and the quality of life of young adults with IDD, saying poor travel skills would limit the youth’s physical and social activities and lead to the degradation of various abilities. In contrast, independent travel could provide them access to the world beyond their houses; as one teacher said, “They could hang out in parks or see movies with friends (SZ-T-6).” with one parent noting, “It’s a good way for my child to expand his social circle (CS-P-5).” We also noticed the importance of helping children gain travel skills to enhance parents’ quality of life. Teachers and parents described that mastering travel skills could reduce parents’ safety concerns and stress. As one parent remarked, “We could worry less (CD-P-4).”, with which another parent stated similarly, “It will reduce the stress for parents, for example, if children cannot travel independently, we have to accompany them all the time. However, if they don’t rely on us, we don’t need to spend any time on the road (BJ-P-2).”

## The Practices for Supporting Transportation

Teachers and parents reported using several practices to support transition-age youth with IDD gain transportation skills and achieve independent transportation, which were coded as the second major theme.

### Parents and Teachers Playing Integral Roles

Currently, cultivating independent travel skills for IDD students is mainly undertaken by families and schools. Almost all teachers and parents recognized that parents are key supporters, having been their children’s main bearers of education since they were young. Teachers commented that developing youth with IDD’s travel skills primarily depended on parents’ attitudes and daily family-based education, such as “shopping, going to the hospital, etc (CD-T-4).” The interview results indicated parents offered their children various transportation training and exercise opportunities; however, some parents were overprotective and cautious about potential problems during their children’s journeys, following them everywhere to prevent accidents. For example, a teacher mentioned that “Some students walk in front of them, and their parents follow all the way, just like a guardian, including swiping disabled cards (pension cards) on the bus, which parents also assist. (BJ-T-2)”

Although there were limited chances for transportation instruction or training in school education, some teachers believed they had taken on important family education assistance roles by advising and guiding parents through regular home-school communication:

We met with parents, and we worked together to analyze their children’s current abilities, including telling parents about the necessity of independent travel and its benefits for children’s long-term development. Then, based on each student’s performance, we gave parents some suggestions, such as gradually letting go, and then giving them a chance to walk independently, what should this child do if they encounter unexpected situations on the road, providing children with a mobile phone or a phone watch, etc. (BJ-T-1).

Some teachers also offered necessary support for parents and precisely designed personal transportation training plans for individuals with IDD. As one teacher said, “I told them how to gradually let go, like what they need to do, step by step … and made a plan for the student (CD-T-1).”

### Safety Awareness and Traffic Rules Training

Parents and teachers prioritized developing safety awareness and knowledge of traffic rules in cultivating transition-age youth with IDD’s independent travel skills. ‘Safety’ was a frequently repeated word when participants discussed transportation training; as one teacher articulated, “Safety is always paramount (SZ-T-4),” an idea echoed by a parent, who stated, “Without this premise, I wouldn’t dare let him travel alone even if he knew the way (HZ-P-1).” Some parents, in order to guarantee the safety of their children, demand youth with IDDs to carry phone watches or cell phones so that their locations can be tracked. For example, as one parent said: “I always tell him to take his phone watch, which has a GPS locating function, so that I know whether he is traveling safely according to the set route (CS-P-1).” Parents also noted that they guided children with IDD to obey traffic rules and establish a sense of safe travel in their actual lives. The training content mainly focused on rules for crossing the road and taking public transportation. One parent shared the following example:

I just tell him to look left to see if there is a car, then walk to the middle of the road and then look right to see if there is a car. ‘Be sure to follow the traffic lights, and then you can walk when others are walking. If others stop, you should stand there and don’t move.’ That’s how I teach him (CS-P-3).

In addition to teaching children how to take public transportation, parents also supported them in becoming familiar with public transportation etiquette and being considerate on public transport. One parent commented,

After teaching him, he will know the rules and etiquette, and he will also be polite. Now, he could queue up first before boarding, then get off, and then swipe his card. These rules are all known to him. I also told him that in crowded situations, he should keep his voice down, and food cannot be eaten on buses (CD-P-1).

Moreover, as youth with IDD may find it difficult to deal with emergencies, some teachers and parent anticipated common potential problems they might encounter during their trips and conducted drills and taught youths the solutions in advance. For example, one parent would stress to his child that “If you get on the wrong bus, when there is no communication device, don’t get off and follow the bus back. Because our buses are going back like this, repeatedly, there is just a delay (CS-P-5).”

### Natural Environment Training

Parents emphasized the importance of practicing travel skills in the natural environment; as one parent put it, “When encountering any situation on the way, we taught him the corresponding solution (CD-P-2).” Indeed, parents usually incorporated transportation training into their children’s daily lives, repeatedly using their daily commuting time to practice and strengthen their travel skills. One parent described how she followed the principle of gradual improvement and prompt reduction:

In the beginning, I accompanied him to the subway station nearby the school then he walked to school alone. Then I just accompany him to the interchange station … next, I just send him to the nearby station … finally, he could go to school on his own (CD-P-2).

Participants reported several strategies to teach transition-age youths travel skills in real-world contexts, including peer tutoring, visual stimulation, etc. Some teachers and parents may include their peers in the process of training students' independent travel skills, using peer support to enhance their confidence and motivation to learn independent travel, or using methods such as peer tutoring to improve their level of independent travel. As one parent remarked:

I invited her and her good friend, a girl at her age (also with intellectual disability), to learn how to take the subway together. I took them on the subway several times and let them rehearse independently, and they succeeded. Having someone to accompany them would give them more courage, they may not dare to do it alone (CS-P-3).

In addition, a teacher stated, “One well-trained student led another student to take the subway home and successfully taught this student to take the subway without any additional teaching from us (CS-T-1).” Also, Visual stimulation is also another commonly used method. For example, one mother printed out bus and station route maps to provide visual cues for their child; “Each station was on it. At the station where my child needed to get off, I framed it with a red pen and marked it with a pentagram, which means ‘you can’t miss this station’ (CS-P-1).” Teachers and parents shared that drawing and memorizing visual travel routes was important for strengthening youth with IDD’s travel skills. For fixed travel routes, teachers and parents commonly assisted students with IDD in reviewing the transportation routes, station names, or iconic buildings to strengthen their memories and enable them to identify their routes. For example, one teacher stated, “I just draw a route, like a subway route, and leave a space for them to fill in, which station to transfer to, and which direction to transfer to (CS-T-1).” By recognizing these key visual cues, students with IDD could “basically have a sense of direction.” In addition, when youths needed to go to an unfamiliar or new location, teachers and parents helped them plan their routes by setting destinations, choosing transportation, and arranging travel times.

## The Challenges of Transportation

The final major theme that emerged was the challenges of transportation. Parents and teachers noted a variety of challenges in developing travel skills of youth with IDD and helping them access transportation, at the individual, school and social levels.

### IDD-Associated Challenges

IDD-related challenges could make it difficult for youths to travel independently. Teachers and parents detailed such IDD-related challenges as cognitive level, oral communication skills, emotional problems, and motor ability. Attention, memory, and literacy skills are necessary for students to learn travel routes and take transportation. To learn travel skills, youth with IDD must remember iconic buildings along the way and identify platforms; a lack of relevant abilities will affect their training negatively. For example, a teacher noted that, “Some students with IDD may not have the relevant skills, such as being unable to remember the road, even being completely unable to concentrate. I don’t think we would force parents to encourage these children to travel independently (BJ-T-1).”

Poor oral communication skill is an obvious barrier to youths’ independent travels. When encountering unexpected events, it is hard for youths who lack basic communication skills to seek help from others because “Not everyone can understand what they are saying (SZ-T-7).” Some transition-age students with IDD, especially those who rely heavily on their parents and teachers, may be “very nervous and emotionally unstable (CS-T-1)” and could experience serious emotional or behavioral problems when traveling alone; given the potential safety issues, parents and teachers were unlikely to train such youths to travel alone. Additionally, some youths had limited motor abilities because of sensory or physical impairments, making traveling alone difficult in many Chinese cities. In such cases, as described by three teachers, “They are all picked up by their parents (CS-T-2; SZ-T-1; SZ-T-7).”

### Lack of Transition Services Focused on Transportation

Schools are crucial to preparing transition-age students for future independent lives. However, teachers and parents noted the shortcomings of current transition services in special schools in China. Although several school activities offered students opportunities to select destinations and plan routes, one parent complained that such activities were rare (SZ-P-2). Teachers express that there was no unified guidance on curriculum standards and resources at the vocational education stage; as such, how teachers supported transition-age students with IDD to acquire travel skills depended on their willingness and teaching experience. One teacher stated,

There is no set of textbooks on the topic or content of transportation. I just used some online resources, which are actually not systematic and comprehensive. In fact, I don’t know whether my instruction and training are good or not, there is no standard, and I also don’t know how to improve it (SZ-T-3).

Some teachers also mentioned the lack of specific training staff, available space, and facilities. One teacher commented that transition services lacked travel skills tutors, saying, “The full-time job coaches are needed to fill the gap in transition services. In our school, it is difficult for teachers to allocate their spare time to do this, and I do not think the training is done properly (CD-T-1).” Another teacher commented that her school’s related training facilities were insufficient to support transportation training for students with IDD, adding that “Teachers could do traffic training through simulated scenarios, but our school seems to lack this condition, and we do not have enough facilities or the space (CS-T-2).”

### Insufficient Transportation Social Services

Teachers and parents stated that numerous physical and psychological obstacles to individuals with IDD’ traveling alone persist in society, such as a lack of consideration of IDD students’ needs in physical settings, a misunderstanding of people with IDD in society, and a lack of relevant support. Several parents and teachers expressed a desire to improve transport accessibility for all; for example, they mentioned that the current public transportation does not fully meet the needs of people with IDD, even in economically advanced cities. One teacher remarked, "Some students with cerebral palsy … use wheelchairs, but not all buses and subways are available for them (SZ-T-5).” Another shared a similar insight, noting that “the traffic slogan is a bit messy (CD-T-2).” Some teachers and parents noticed that negative social attitudes toward individuals with IDD are common, especially in economically underdeveloped areas. For example, one teacher recalled some parents sharing their children’s transportation experiences by saying “In small towns, there is still social exclusion (CS-T-1),” decreasing parents’ willingness to push their children to travel alone. One teacher stated, “Public misunderstanding [has] led to parents being unwilling or afraid to let go (SZ-T-5).”

Additionally, several parents expressed their desire to get social support from the community or social organizations when teaching children with IDD travel skills. For example, one parent has expressed that she needed volunteers to help with her child’s transportation training, but there were no relevant personnel in the community who could provide such services. She mentioned, “I said, I want you to help me find a volunteer ... just a little help. I told them a long time ago, but they just said they couldn’t find it (SZ-P-1).”

# Discussion

This study aimed to explore the transportation experiences of transition-age youth with IDD in five cities in China by analyzing perspectives across key stakeholders, teachers and parents. All teachers and parents recognized the significance of transportation and reported several practices by which parents and teachers supported developing youths’ travel skills. Furthermore, participants pointed out the barriers to transportation that young adults with IDD commonly experience in China. These findings clarified the importance of transportation training for transition-age youth and, in turn, could drive transition services and inspire future research.

Our findings uncovered three main themes. The first theme highlighted that participant parents and teachers linked transportation with independence, employment, and high quality of life. To be more specific, transportation allowed students with IDD to enrich their social activities, increase their community participation, extend their social networks, and even improve their communication skills. The current research also shows that most teachers and parents believe that transportation skills are important for youth with IDD to obtain employment. These results are consistent with previous research in the West, suggesting that transportation plays a crucial role in many aspects of an individual’s daily life, including employment, education, healthcare, shopping, social occasions, and various entertainment activities (Jansuwan et al., 2013; Sabella, 2019). Therefore, people with disabilities could have the chance to be involved in their communities and participate in social activities, and become more independent (Alanazi, 2022; Palisano, et al., 2009). Notably, when talking about the importance of transportation for children, parents focused on various aspects of their children’s rich life, including entertainment, social circles, and employment, not just independence. Some teachers and parents also found that transportation could drive transition-age youth with IDD’s development of skills related to self-determination. This finding echoes Stock et al.’s (2011) research, which demonstrated that individuals with intellectual and cognitive disabilities’ self-determination and confidence-related skills (except for independence) increased after they mastered transportation skills. Wehmeyer and Garner (2003) found that intellectual disabilities were not the decisive factor in individuals’ self-determination abilities, but whether they were given the right to make choices and decisions and supported in achieving them. Transportation could provide individuals with IDD opportunities for choice and decision-making. For example, they could control travel times and approaches and have the chance to solve problems independently, thereby developing skills related to social adaptability, communication, problem-solving, and self-help. Additionally, similar to Stevens et al.’s (2016) findings, acquiring transportation skills lessens guardians’ and caregivers’ companionship time, allowing them to spend more time on leisure and employment activities. Similarly, teachers and parents claimed that youths’ mastering travel skills lessened their dependence on families, reducing parents’ stress and input and the cost of family parenting.

The second theme described how parents and teachers supported transition-age youth with IDD to develop transition skills and achieve independent transportation. Due to a lack of clear requirements and standards for students’ transportation skills in national educational policies, schools have not attached enough importance to transportation introduction or training. In this case, parents were the main implementers of transportation training and school teachers took on an assistant role, like in the West (Bross et al., 2023; Hirano et al., 2018). However, in this study, teachers and parents seldom discussed cooperation with the other party in developing the transportation skills of youth with IDD, which indicated that cooperation between parents and teachers might have not yet been well-established. Regarding the training content, parents and teachers have extensively discussed traffic safety knowledge, travel route planning, transportation tools’ rules, and measures to deal with unexpected situations. Among them, safety knowledge was regarded by teachers and parents as a prerequisite for cultivating the transportation skills of youth with IDD. Parents and teachers concerned more about safety issues might be due to students with IDD having restricted social adaptability, limited attention span, poor safety awareness, and a higher risk of traffic accidents (Feeley et al., 2015).

Given IDD students’ limited cognitive abilities, especially those with autism, parents and teachers also emphasized the need to teach travel etiquette so students could avoid conflicts with others. Additionally, concerned that students with IDD might find it difficult to handle unexpected events during their travels, Chinese teachers and parents usually anticipated potential problems, conducted drills in advance, and offered them solutions.

Moreover, teachers and parents noted that the transportation training for students with IDD is mainly based on real-life situations, particularly those related to students’ daily commuting. Previous studies have shown that the closer the intervention scenario is to the natural scenario, the more effective the travel skills intervention for students with IDD (Price et al., 2018). During the training, teachers and parents adopted strategies such as gradual improvement and gradual withdrawal of prompts, combined with various strategies. A recurrent strategy mentioned by all participants involved providing visual prompts (including drawing maps, memorizing key landmarks, and printing pictures), in line with existing studies (e.g., Courbois et al., 2013). Although there were voice stop announcements on buses, most teachers and parents still provided youth with IDD visual cues involving routes or stations, perhaps because combining visual and auditory prompts provides better support (Price et al., 2018). Interestingly, although many participants mentioned the value of GPS, Chinese parents seemed more inclined to ensure their children’s safety by checking GPS apps rather than training students to use them.

The final important theme highlighted the transportation challenges facing transition-age youth with IDD in China. The first barrier discussed by participants was IDD-related characteristics, including cognitive ability levels, emotional and behavioral problems, and sensory and physical impairments. Regarding cognitive ability, the research findings aligned with Davies et al.’s (2010) view that independent travel requires individuals to master necessary cognitive skills; however, this view was mainly based on the traditional medical model of disability, which treats it as an individual defect and attributes disability issues to internal factors (Haegele & Hodge, 2016). Some teachers and parents believed that individuals with IDD should be responsible for solving transportation problems, overlooking social responsibility. Many students’ abilities are underestimated (Haveman et al., 2013). For example, despite not having relevant prior training, youth with IDD in the current study are reported to be able to take the opposite-direction line to their destinations after realizing they had missed their station or taken the wrong-direction routine, which exceeds parents’ and teachers’ expectations.

Currently, national policies include no clear requirements for the transportation instruction and training of students with disabilities in China. While national curriculum standards do address some transportation knowledge and skills - like requiring middle-grade students (Year 4-6) to be able to read commonly used symbol information (such as traffic signs, billboards, signs, warning signs, etc.), understand traffic safety knowledge, and comply with traffic rules (Chinese Ministry of Education, 2016) - there are no clear and specific requirements for developing practical travel skills. Some teachers reported that because their schools had not attached enough importance to transportation services, they lacked systematic textbooks and teaching materials and had insufficient accessibility facilities, which aligns with previous Chinese studies (e.g., Ren et al., 2018). Some accessibility designs did not meet the standards and neglected practicality and safety; for example, traditional bus doors did not allow passengers who could not climb steps to board. In addition, many people still have prejudices about disabilities, which is a significant barrier for people with IDD (Chan et al., 2009) and may decrease their willingness to use public transportation. Consequently, the lack of related services has left parents ‘high and dry’, discouraging some from finding social services that support children with IDD’s transportation. A policy focus on transportation services is needed.

## Limitations and Implications for Future Research

This study has some limitations. First, we recognized the significance of the participation of transition-age youth with IDD while exploring their transportation experiences. However, at this stage, we did not include the participatory of youth with IDD due to our lack of experience in interviewing this cohort. As such, future studies should use appropriate methods to facilitate the participatory of youth with IDD. Second, most participants were female, limiting male perspectives. Future studies should consider recruiting more male stakeholders as participants. Third, this study collected data only through semi-structured interviews because the Covid-19 pandemic disturbance in China, which prevented us from observing transportation instruction and training in classrooms and communities. The use of a single research method may affect the reliability of the research, so future studies might consider observing youth with IDD’s transportation in the natural environment or conducting experimental intervention studies to train transportation skills for youth with IDD.

## Implications for Practice and Policy

Schools, educational institutions, and other transition-related organizations should pay attention to transportation training for transition-age youth with IDD and treat it as a significant part of transition services. Schools and educators should actively work with parents to provide comprehensive services in schools and communities to support youth with IDD to travel independently. Some teachers reported discussing youth with IDD’s performance and needs with their parents, offering suggestions about training their children to travel alone. However, most teachers did so on their initiative; there was a lack of systematic school-family collaboration. None of the participant teachers in this study reported that special education schools deemed travel skills instruction necessary. Schools should also take on travel skills training responsibilities and strengthen communication and cooperation with families. Students’ independent transportation should be included in individualized education plans, relevant teaching materials and resources should be actively developed, and resources from all parties should be combined to provide comprehensive support for transition-age youth.

Our findings also clarify the need to improve existing policies. According to participants in this study, current policies cannot support youth with IDD to access public transportation and fully participate in their communities. Hence, the government needs to refine the standards for accessibility facilities and environment and enhance the enforcement of legislation on physical accessibility. The improved policy should ensure people with disabilities can physically use transportation services and guide schools and related organizations to provide transportation services and related training for transition-age youth with IDD. Finally, the government should commit to the complex task of eliminating social attitude barriers and changing societal attitudes through such tactics as increasing the public’s contact and experience with people with disabilities, information exchanges, disability simulations, protests, affirmative action, and impression management (Chan et al., 2009) to create a more inclusive social environment.

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