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Disability symposium

Unintentional injuries among Chinese children with different types and severity of disability

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ABSTRACT

Purpose: Little research has been done in China to study injury in individuals with disability. We investigated the impact of type and severity of disability on injury among children with disability in Hubei Province of China.

Methods: A sample of 1201 children with disability were matched with 1201 healthy children on gender, age, and neighborhood. Disability type and severity were determined using the Chinese national standards. Caregivers were interviewed face-to-face about nonfatal unintentional injuries suffered by the child in the past 12 months before the interview. Univariate χ^2 test and logistic regression models were used to investigate association between disability type/severity and nonfatal unintentional injuries.

Results: Injury rate among children with disability was significantly higher than that among children without disability (10.2% vs. 4.4%; $P < .001$). Children with multiple disabilities had the highest risk of injury after controlling for confounding variables (odds ratio, 4.54; 95% confidence interval, 2.82–7.30; $P < .001$). The magnitude of the association between disability and injury varied by type and severity of disability.

Conclusions: The magnitude of the association between the presence or absence of disability in children and their risk of injury was large and significant, regardless of the type or severity of the children's disabilities.

Introduction

Globally, an estimated 200 million—or 10% of the world's children—live with disability [1,2]. Disability in childhood brings lifelong physical and psychological challenges to the child and the family and could cause huge economic burdens to the society [3]. Children with disability appear to need more extensive health care services but experience personal and environmental barriers that prevent full involvement in active life activities [4,5]. Data from the Second National Disability Survey suggest that almost 83 million people, or nearly 6.3% of the population, have different types of disability in China [6]. Of those with disabilities, about 3.87 million are 0–14 years children [7,8]. It is estimated that about 199,000 new cases of disability in children younger than 6 years are diagnosed each year in China [8]. In response to the increasing number of children with disability, China has initiated special public health programs targeted at children with disability in recent years [9,10].

In comparison with children without disability, increasing evidence suggests that children with disability are at higher risk for secondary conditions [11–14], including unintentional injuries [15–21]. Children with disability may have a reduced ability to handle environmental hazards because of physical limitations,

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impairments in mental processing, or in their ability to adjust to their environment [16,17,22]. Previous publications that reported an increased risk of injury in children with disability came from high-income countries [15,17–22]. In our recent publication about medically attended injuries among Chinese children with disability, we found that injury risk in children with disability is significantly higher than that in children without disability [23]. We compared the patterns of injuries between children with and without disability and investigated the association between home environmental hazards and risk of nonfatal injuries. However, we did not examine the impact of disability types and severity on injury risk in the previous publication.

We hypothesize that injury risk differs between children with different types or severity of disability. In this article, we report injury prevalence of children with single versus multiple disabilities, injury prevalence by severity of disability, and odds ratios (OR) of injury. We also evaluated the recommended disability screening tool, the United Nations Children's Fund Ten Questions (TQ) for childhood disability [24–29] in a subsample of Chinese children. Findings from our study add to the world literature on an important public health issue in children with disability.

Methods

Study setting

Hubei province, located in central China, has 102 counties and a total of 60 million population. The China Disabled Persons' Federation (CDPF) is the official agency for individuals with disability in China. A registry database is maintained by the CDPF's county level office to monitor the number of persons with disability in that county and track medical and rehabilitation services provided by the government. Individuals with disability who want to apply for government funded services need to be evaluated by a certified physician using the standards of China Classification and Grading Criteria of Disability [30,31]. Individuals who meet the criteria will be issued an official certificate that lists the type and severity of the disability he/she has. With help from the Hubei Disabled Persons' Federation, five counties were randomly selected for our study.

Data source and study population

We obtained the registry database of persons with all types and severity of disability in the selected five counties. No random sampling was conducted, and all children, aged 1–14 years, registered in the database were eligible for this study. In our survey, a child must have had the disabling condition(s) for at least 12 months before the interview to be eligible to participate. This allowed us to ensure that the disabling conditions predated any injury that occurred in the past year. For every child with disability, we matched a healthy child who had the same gender and age and lived in the same neighborhood. If the parent or legal guardian agreed to participate in our study, a 30-minute interview was conducted face-to-face with the parent or guardian. The face-to-face interviews were carried out from May to August 2011 by Master degree and PhD students from Tongji Medical College whose training and field study supervision were overseen by the principal investigator at the Tongji Medical College. The questionnaire was developed together with researchers at the Center for Injury Research and Policy, the Research Institute at Nationwide Children's Hospital, The Ohio State University College of Medicine. The questionnaire was tested before the formal survey. A pilot testing was conducted in 81 children in one of the selected five counties. Both children with disability and their healthy counterparts were interviewed using the same questionnaire except that questions about type and severity of disability, which were asked only in children with disability. During the survey, quality of finished questionnaires was checked by a field data collection manager each day and incomplete questionnaires were returned to the interviewer, who obtained the missing information from parents or guardians the next day.

The protocol of this study was approved by the Institutional Review Board of School of Public Health of Tongji Medical College.

Study measurements

Disability

Disability was categorized using the following six groups that are defined by the China Classification and Grading Criteria of Disability: vision disability, hearing disability, speech disability, physical disabilities, mental retardation, and mental health disorders [30,31]. In addition, individuals were also categorized as having either a single disability or multiple disabilities. In our study, a person who had multiple disabilities was classified into one of the six categories of disability mentioned above according to the most severe type of disability he/she had, which was consistent with the type of the disability listed in his/her official certificate issued by CDPF. Severity of disability was also classified into one of the four levels of disability based on the China Classification and Grading Criteria of Disability: level 1 is the most severe disability level and level 4 is the mildest degree of disability [30,31]. The type and severity of disability were obtained from checking every child's official certificate during the face-to-face interview to the parents or guardians and recorded in the questionnaire by the interviewer.

Injury

Parents or guardians of children were asked to report nonfatal unintentional injuries suffered by the child in 12 months before the interview date. An injury was defined as an event that caused the injured child to seek medical care at a hospital or a community clinic. Detailed information was collected about the most recent injury episode, including the external cause of injury, body parts injured, location of injury, activity at the time of injury, and medical treatment after injury. We selected the primary cause as the leading cause of injury. For example, if a child was struck by an object or a person first and then fell, struck by a person or an object was considered the leading cause of injury.

Sociodemographic variables

We also collected sociodemographic variables that are usually considered as risk factors for injury: gender and age of the child, parent's education level, family income, single-parent family status, time of being supervised by an adult per day, and total number of family members. Family members could include the child, the child's parents, siblings, grandparents, and a father's sister or brother who was not married. The time of being supervised by an adult refers to the average time per day that the child is within the range of his/her primary care giver's supervision. Family income was self-reported as total monthly household income in Chinese currency Renminbi (RMB). One RMB was approximately equal to U.S. $0.157 at the time of the survey. All sociodemographic variables were categorical except for the age and number of family members when collected in the questionnaire.

The TQ. In addition to sociodemographic information and health status questions, our questionnaire also included a Chinese language version of the United Nations Children's Fund TQ about limitations in daily activities. The TQ contains 10 questions and is an appropriate and useful instrument for detecting disabilities for all children aged 2–9 years and in all cultures [24–29]. The TQ were