

Sampling Survey of Disability in 0-6 Year-old Children in China

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Objective To investigate the current status of disabled children and prevalence of disabilities in children aged 0-6 years and their risk factors, and to provide scientific evidence for making relevant policies for disabled children. **Methods** In a community-based cross-sectional study, multi-phase, stratified, unequal proportional and cluster sampling was adopted to survey 60 124 children aged 0-6 years. All the investigated children were screened for disabilities, and those with positive screening tests were further diagnosed by various specialties. **Results** A total of 819 children were diagnosed as disabled with an overall prevalence of 1.362%, 0.155% for hearing disability, 0.160% for visual disability, 0.931% for intelligent disability, 0.424% for limb disability, and 0.101% for mental disability. Prevalence of disability in children was higher in rural areas, and in families with two or more children, low educational level or in divorced families. **Conclusion** The prevalence of disability can be reduced by economic development, improvement of health care and quality of population, as well as harmonious familial relationship, early prevention of disability, and preschool education for disabled children.

Key words: Children; Disability; Prevalence; Risk factor

INTRODUCTION

Disability is an unavoidable social burden in the course of human development. Chinese government always cares about the disabled persons, and has made a series of laws and regulations for preventing disability and improving the quality of life of the disabled people, and brought the work for the handicapped into national economic and social development plan. With the national economic and social development, a great change in the situation of the handicapped, especially the disabled children, has taken place through the implementation of the three five-year plans for the disabled people and relevant preventive measures for disability. However, the government has not performed any special survey on disabled children nationwide in recent years since 1987. In order to investigate the prevalence of

disability in children and its risk factors, a sampling survey of disability in children aged 0-6 years was carried out in 2001.

MATERIALS AND METHODS

Subjects

A total of 60 124 children aged 0-6 years born before June 6, 2001, in Tianjin and Jiangsu, Jilin, Henan, Guizhou, and Gansu Provinces were included in the study.

Methods

Multi-phase, stratified, unequal proportional and cluster sampling was adopted. Tianjin, Jiangsu, Jilin, Henan, Gansu, and Guizhou were randomly selected

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as the survey areas which are different in economic status and geographic locations, and one city at prefecture level and one county were selected from each province (or municipality).

According to the rank of their gross domestic product (GDP) in 1999, all cities and counties selected were divided into three sub-groups, and one developed, one moderately developed, and one under-developed neighborhoods (townships or towns) were selected from each city (county).

Twelve clusters, 125 children each, were selected from the developed and under-developed neighborhoods and 16 clusters were selected from the moderately developed neighborhoods. Six clusters, 250 children each, were selected from the developed and under-developed townships or towns and eight clusters were selected from the moderately developed townships or towns. Therefore, 40 clusters were selected from each city, 20 clusters from each county, and 60 clusters from each province (municipality), totalling 360 clusters and 60 000 children nationwide.

Before the field survey, training courses were held at national and local levels for all the investigators involved in screening for disability. All the subjects were surveyed in health-care facilities at

townships, towns or neighborhoods, and those absent during the first survey were surveyed at their homes. All the investigated children were screened for disabilities, and those with positive screening tests were further diagnosed by various clinical specialists using *Criteria for Disability* issued by the State Council of the People's Republic of China in 1987.

All data collected from field survey were analyzed using SPSS10.0 software.

RESULTS

Overall Prevalence and Detection Rates

Among 60 124 children aged 0-6 years in this survey, 2061 were disabled, accounting for 3.43% of the total children, and 819 were finally diagnosed as disabled accounting for 1.362% of the total children.

Positive Screening, Prevalence and Detection Rates of Five Kinds of Disability

Positive screening, prevalence and detection rates of five kinds of disability in 0-6 year-old children are shown in Table 1.

TABLE 1

Positive Screening, Prevalence, and Annual Average Detection Rates of Five Kinds of Disability in Children Aged 0-6 Years

Disability	Positive Screening	Positive Rate (%)	No. of Diagnosed As Patients	Prevalence Rate (%)	Annual Average Detection Rate (‰)
Hearing	209	0.35	93	0.155	0.221
Vision	307	0.51	64	0.106	0.152
Intelligence	1008	1.68	560	0.931	1.331
Limb	397	0.66	255	0.424	0.606
Mental	140	0.23	61	0.101	0.145
Total*	2061**	3.43**	1033**	1.718**	2.454**

Note. * Total number of children investigated = 60 124; ** Complex disability included.

Risk Factors for Disabled Children Aged 0-6 Years

The risk factor for disability in children were evaluated by univariate analysis, such as area, economic status, gender, age, nationality, preschool education, number of siblings, parents' consanguinity, educational level and marriage status of their parents, and status of their upbringing.

Prevalence of disability in children aged 0-6 years by area, region, gender, nationality, and preschool education are shown in Table 2.

Chi square test showed that the prevalence of disability in children was associated with the age of children by chi-square test ($P < 0.01$, Table 3).

The prevalence of disability in children in rural areas was higher than that in urban areas ($P < 0.01$).

The prevalence of disability in children aged 0-6 years varied in different areas ($P < 0.01$).

The prevalence of disability in boys aged 0-6 years was significantly higher than that in girls ($P < 0.05$).

The prevalence of disability in children aged 0-6 years was slightly higher in minority nationality than that in Han people without statistical significance ($P > 0.05$).

Less disable children aged 0-6 years received preschool education than those without disability with a statistically significant difference ($P < 0.01$).

The prevalence of disability in children aged 0-6 years varied with their parents' educational level (in Table 4) and the highest rate of disability was detected in children whose parents were illiterate or semi-illiterate and the lowest rate of disability was found in

TABLE 2

Prevalence of Disability in Children by Area, Region, Gender, Nationality, and Preschool Education

Risk Factors	No. of Children	No. of Disabled	Prevalence (%)	χ^2	<i>P</i>
Area					
Urban	30 102	400	1.33	306.60	0.000
Rural	30 022	419	1.40		
Economic Status					
Developed	19 999	193	0.97	50.330	0.000
Medium Developed	20 050	358	1.79		
Under-developed	20 075	268	1.34		
Gender					
Male	32 444	472	1.45	4.504	0.034
Female	27 680	347	1.25		
Nationality					
Han	58 550	790	1.35	2.775	0.093
Minority	1574	29	1.84		
Preschool Education					
Yes	25 016	249	1.00	199.460	0.000
No	10 758	318	2.96		

TABLE 3

Age-specific Prevalence of Disability in Children Aged 0-6 Years

Age (Years)	No. of Children	No. of Disabled	Prevalence (%)
0	6944	52	0.75
1	8869	92	1.04
2	8537	108	1.27
3	8759	108	1.23
4	9261	146	1.58
5	10 019	172	1.72
6	7735	141	1.82
Total	60 124	819	1.36

Note. χ^2 for trend=50.699, *P*=0.000.

TABLE 4

Prevalence of Disability in Children by Their Parents' Educational Level

Parents' Educational Level	Father		Mother	
	No. of Children	Prevalence (%)	No. of Children	Prevalence (%)
Three-year Curriculum College	9710	0.72	7466	0.70
High School	18 335	1.10	16 730	1.00
Junior High School	25 757	1.53	26 294	1.38
Elementary School	5837	2.33	8200	2.21
Illiteracy/semiliteracy	366	3.28	1345	3.57
Total	60 005	1.35	60 035	1.35
χ^2 for Trend	85.257		117.097	
<i>P</i>	0.000		0.000	

those whose fathers had a college educational level. Chi square test revealed that the prevalence of

disability in children aged 0-6 years decreased with the level of their parents' education (*P*<0.01).

The prevalence of disability in children aged 0-6 years varied with their parents' marital status ($P < 0.01$, Table 5). The prevalence of disability in children whose parents were in first marriage was lower than that in children whose parents were remarried, divorced and other marital status (Bonferroni adjustment for multiple comparisons).

The prevalence of disability was higher in children with consanguineous parents than in those with non-consanguineous parents ($P > 0.05$, Table 6).

The prevalence of disability in children aged 0-6

years varied with their upbringing status ($P < 0.01$, Table 7). The prevalence of disability in children raised by single parent was higher than that in those raised by both parents (Bonferroni adjustment for multiple comparisons).

The prevalence of disability in children aged 0-6 years varied with their family size, and more disabled children were detected in families with two or more children than in those with only one child ($P < 0.01$, Table 8).

TABLE 5

Prevalence of Disability in Children by Their Parent's Marital Status					
Parent's Marital Status	No. of Children	Disabled		Normal	
		<i>n</i>	%	<i>n</i>	%
First Marriage ^a	58 875	774	1.31	58 101	98.69
Remarried ^b	701	20	2.85	681	97.15
Divorced	330	13	3.94	317	96.06
Others	218	12	5.50	206	94.50
Total	60 124	819	1.36	59 305	98.64

Note. $\chi^2=56.740$, $P=0.000$. ^aThe parents were both of first marriage. ^bThe father or the mother was remarried.

TABLE 6

Prevalence of Disability in Children by Their Parents' Consanguinity					
Parents' Consanguinity	No. of Children	Disabled		Normal	
		<i>n</i>	%	<i>n</i>	%
Yes	49	2	4.08	47	95.92
No	60 075	817	1.36	59 258	98.64
Total	60 124	819	1.36	59 305	98.64

Note. $\chi^2=2.699$, $P=0.144$.

TABLE 7

Prevalence of Disability in Children by Their Raising Status					
Raised by	No. of Children	Disabled		Normal	
		<i>n</i>	%	<i>n</i>	%
Both Father and Mother	58 656	782	1.33	57 874	98.67
Father or Mother Alone	450	18	4.00	432	96.00
Grandparent	944	18	1.91	926	98.09
Others	74	1	1.35	73	98.65
Total	60 124	819	1.36	59 305	98.64

Note. $\chi^2=25.754$, $P=0.001$.

TABLE 8

Prevalence of Disability in Children by Family Size					
Family Size	No. of Children	Disabled		Normal	
		<i>n</i>	%	<i>n</i>	%
One Child Only	48 240	609	1.26	47 631	98.74
Two or More Children	11 884	210	1.77	11 674	98.23
Total	60 124	819	1.36	59 305	98.64

Note. $\chi^2=16.601$, $P=0.000$.

DISCUSSION

Representativeness of Samples in the Survey

The sex ratio of the subjects surveyed was 117.21: 100, similar to that of the Fifth National Population Census in 2000 (119.19: 100)^[1], and slightly higher than that in National Children Survey in 1992 (113.64: 100)^[2]. Age structure of the children in this survey (11.55%, 14.75%, 14.20%, 14.57%, 15.40%, 16.66%, and 12.87% for aged 0, 1, 2, 3, 4, 5, and 6 years, respectively) is also similar to that of the Fifth National Population Census in 2000^[1] and the National Children Survey in 1992^[2]. Therefore, the samples selected in this survey can be representatives of the national children population aged 0-6 years.

Status of Disability in Chinese Children Aged 0-6 Years

(1) Prevalence of disability in children aged 0-6 years

Among 60 124 children aged 0-6 years, 819 were diagnosed as having disability with a prevalence of 1.36%, decreased by 0.35% compared with that of 1.71% in National Disability Sampling Survey in 1987^[3], indicating that disability prevention in China has made significant achievements in recent years.

The prevalence of disability in children aged 0-6 years was 1.33% in urban areas and 1.40% in rural areas. There are 1 417 000 disabled children aged 0-6 years in China, 252 000 in urban areas and 1 165 000 in rural areas^[1].

The prevalence of children disability varies significantly all over the world, 8.9% in Israel among 2-3 year-old children and 17.5% among 7-year-old children in 1983^[4], 1.44% in Ghana in 2001^[5], and 6.5% of all children under the age of 18 in America in 2002^[6]. Such a difference is related to the definition of disability, screening method and diagnostic criteria in different countries, except for geographical variation^[4,6].

(2) Analysis of causes of disability in children

A number of risk factors for disability in children were analyzed in the survey. The results indicated that the prevalence of disability was related to their residential area, gender, age, preschool education, family size, parents' educational level and marital status and their raising status.

The prevalence of disability in rural children (1.40%) was significantly higher than that in urban children (1.33%). The prevalence of disability was 0.97%, 1.34% and 1.79% respectively in developed areas (0.97%), under-developed areas (1.34%) and the moderately-developed area (1.79%). In general, the prevalence of children disability in developed areas was lower than that in under-developed areas, indicating

that the occurrence of children's disability is related to economic development and health-care service^[7]. The higher prevalence of children disability in moderately-developed areas is possibly related to more deaths of disabled children, as well as environmental pollution and drug abuse, which should be studied further.

The results of this survey showed that the prevalence of disability in boys (1.45%) aged 0-6 years was higher than that in girls (1.25%), which may be related to boys' higher susceptibility to injury.

The prevalence of disability in 0-6 year-old increased with their age, which was 0.75% in 0 year-old children and 1.82% in 6 year-old children.

The proportion of preschool education in disabled children was significantly lower than that in normal children, due to serious shortage of special institutions providing preschool education for the disabled children as well as trainers and relevant facilities at ordinary institutions providing their preschool education.

The fact that the prevalence of disability was higher in families with two or more siblings may be related to the governmental policy on birth control in China.

The fact that the prevalence of disability was higher in single parent families than that in both parents families may be due to the stability of family.

In conclusion, the detection rate of disability can be reduced by economic development, improvement of health-care service and quality of population, as well as harmonious familial relationship, early prevention of disability, and preschool education for the disabled children.

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