The prevalence of mental retardation by gender, age of diagnosis and location in Zonguldak province, Turkey

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ABSTRACT

الأهداف: الهدف من الدراسة هو تقييم وتشخيص انتشار التخلف العقلي وفقاً لنوع الجنس والعمر والموقع في مدينة زونجولداك بتركيا.

الطريقة: تم الحصول على بيانات ١٩٠٩ حالة تخلف عقلي للأطفال مسجلة بين عام ١٩٩٥م وعام ٢٠٠٣م من مركز توجيه تعليم الإعاقة والبحث. تم تقييم العمر ونوع الجنس ونقاط الذكاء وعمر التشخيص ومناطق العيش لجميع الحالات.

النتائج: كان توزيع التخلف العقلي كالتالي: ٣٠٤ حالة تخلف(١٥,٩٪) تعاني من تخلف عميق وشديد، و١٠٦٠(٥٥,٦٪) تعاني من تخلف متوسط وبسيط و٥٤٥ حالة تخلف (٢٨,٥) على خط الحدود. كانت نسبة الانتشار للتخلف العقلي ١٢,١٪. (الذكور ١٥,١٪ الإناث ١,٩٪). ١٣٢٧ من بين الحالات(٦٩,٥٪) يعيشون في المدينة.

خاتمة: معظم الأفراد المصابين بتخلف عقلي شديد يصبحون قادرون على الانخراط في نظام الخدمة خلال مرحلة الطفولة المبكرة ولكن الأطفال الذين يعانون من تخلف عقلي بسيط خاصة أولئك الذين يعانون من قصورات عصبية أخرى قد لا ينخرطون أبداً في النظام أو أي نظام آخر حتى يصلون سن البلوغ. تم تشخيص معظم الحالات بين العمر ٦ سنوات و١٠ سنوات. يثبت هذا أهمية توجيه وإرشاد مراكز التوجيه وإعادة التأهيل.

Objectives: To evaluate the prevalence of mental retardation by gender, age of diagnosis, and location in Zonguldak, Turkey.

Methods: The data of 1909 mentally retarded children recorded between 1995 and 2003 was obtained from the Learning Disability Guidance and Research Centre. Age, gender, IQ scores, the age of diagnosis, and living areas of cases were evaluated.

Results: The distribution of mental retardation was as follows; 304 cases (15.9%) were profound and severe, 1060 (55.6%) were moderate and mild, and 545 (28.5%) were borderline. The prevalence of mental retardation was 12.1% (male: 15.1%, female: 9.1%). Of the cases, 1327 (69.5%) lived in urban areas.

Conclusion: Most individuals with severe mental retardation become enrolled in the service system during early childhood, but children with mild mental retardation, especially those with no other neurological impairments, may never enter the system or may not do so until puberty. Most of our cases were diagnosed between the ages of 6 and 10. This proves the importance of school guidance of learning disability and their collaboration with The Learning Disability Guidance and Research Center.

Mental retardation (MR) is one of the most frequent and debilitating handicaps among children. The measurement of MR prevalence in a population is usually complicated and a number of problems relating the science of epidemiology to MR are faced. The prevalence of MR varies across countries and regions, and this may be attributed to the variations in major classification systems, definitions, and methodologies. Due to these inconsistent criteria, there are considerable variations in the prevalence of MR from 2-85 per 1000.[1,2] The diagnosis of MR mainly requires 2 components: 1. low general intellectual functions, significantly below average, 2. an onset before the age of 18.[3,4] In addition, deficits in adaptive behavior can be added as a third component of the traditional definition of MR.[5] Although, IQ and age of onset components of earlier definitions of MR are preserved by the

American Association on Mental Retardation (AAMR), quantitative requirements of significant delay in 2 or more of the 10 areas of adaptive functioning are wisely added including communication, self care, home living, social skills, community use, self direction, health, and safety, functional academics, leisure and work. Nonetheless, the valid assessment of most of these 10 areas has not been standardized, therefore, adaptive behavior is more likely to be excluded in epidemiological research of MR. The IQ score was the only tool to classify many children as mentally retarded.[4,6] The etiologies of MR are multiple, and MR prevalence can also be influenced by social, economic, cultural, racial/ethnic, and other environmental factors including the demographics of age and gender. However, epidemiological studies assessing these relationships are scarce. An association between different forms of MR and social class was first proposed by Lewis.[7,8] There are many studies that have consistently found that the prevalence of MR was strongly associated with low socioeconomic status.[9-12] The suggestion that severe mental retardation (SMR) appeared across all social classes and mild mental retardation (MMR) predominantly came from the lower social classes is supported by this study. The finding was also supported by a Norwegian study of 30037 children that showed increased prevalence rates of mild MR related to low socioeconomic status (SES).[13,14] In developing countries, the effect of MR on individuals and society has been understudied and there are limited reports from these parts of world although it is likely to be more important. However, in Bangladesh, it has also been shown that the association with socioeconomic status was more marked for MMR than for SMR.[15] Due to inferior social conditions and limited occupational and educational opportunities, there are some differences in socioeconomic status between rural and urban areas. The purpose of this study was to estimate and categorize the true prevalence of MR in a large population, and to investigate the relationship between different factors such as age of diagnosis, gender, location, and subgroups of MR. The age, gender, IQ resulted, the age of diagnosis, and the location were evaluated in order to establish the differences that might affect the diagnosis and frequency of MR.

Methods. Zonguldak province, which is placed in Northwest of Turkey with a surface area of 3304 km², covers approximately 0.4% of Turkey.[16] The biggest hardcoal mining area and the biggest iron and steel factory of Turkey are placed in this province. The population census has been repeated every 10 years in Turkey, and the last one was performed in 2000. According to the Census of Population 2000, the total population of Zonguldak was 615599 (300676 male, 314923 female), while the urban population was 250282 (126067 male, 124215 female) and rural population was 365317 (174609 male, 190708 female). The number of persons per square kilometers was 198, and the average size of households was 4.2.[16] Among the 157426 individuals aged between 6-18 years, 26373 (13511 male, 12862 female) were living in the urban area, while 131053 (65445 male, 65608 female) were living in the rural area.[16]

In this descriptive study, the data were obtained from the official records of Learning Disability Guidance and Research Center (LDGRC) of Zonguldak, Turkey between the years 1995 and 2003. The LDGRC is a governmental evaluation center of child capacity for learning and continuation of education. It is also a reference center which collects all the MR cases from the whole Zonguldak province. Experienced psychologists in this center are responsible for the evaluation of children and collection of data. The center informs all the patients and their families on the possibility of usage of these data in scientific studies and obtains a consent form from all. Approval was also obtained from the Local Ethics Committee. There were 2308 individual records in the center between 1995 and 2003. Among these individuals, 399 with normal IQ scores, age at diagnosis over 18 years, with coexistence of other medical problems and records that lacked gender, age, age at diagnosis, IQ scores or living areas were excluded and the study was completed with 1909 individuals. The IQ scores were determined, and these scores were used to group the patients according to Accardo and Caputo[3] as follows: IQ <44 profound (severe), IQ 45-70 moderate (mild) and IQ 71-89 slow learner (borderline).

All data were evaluated by SPSS for Windows version 11.0 and mean values were shown as mean ± standard deviation. The comparisons between groups were structured by one way ANOVA test, Chi-square test, and Student t test. Significance was assigned to $p<0.05$.

Results. In this study, 1909 patients with MR were evaluated. Among all cases studied, while 304 cases (15.9%) were found to have profound and severe MR, 1060 (55.6%) had moderate and mild MR, and 545 (28.5%) had borderline MR. Descriptive features of these 3 groups are given in **Table 1**. The prevalence of MR was 12.1% compared with the general population at the same age, and the prevalence of male was 15.1% and female patients was 9.1%. The ratios of patients were 61.9% male to 38.2% female in urban areas and 5.4% male to 3.4% female in rural areas when compared with the general population of the same age and gender (**Table 2**). The diagnosis age of the cases was between 6 and 18 (9.7±2.4). While 1327 of the cases lived in urban areas (69.5%), 582 lived in rural areas (30.5%). The differences in all groups were statistically significant

Table 1 - Distribution of the severity of mental retardation by gender, age of diagnosis, and location.

Variable	Profound/ Severe (N=304)	Moderate/Mild (N=1060)	Borderline (N=545)	P-value
		n (%)		
Gender				0.146
Female (n=715)	110 (15.4)	417 (58.3)	188 (26.3)	
Male (n=1194)	194 (16.2)	643 (53.9)	357 (29.9)	
Age of diagnosis				0.001
6-10 (n=1261)	163 (12.9)	660 (52.4)	438 (34.7)	
11-18 (n=648)	141 (21.8)	400 (61.7)	107 (16.5)	
Location				0.001
Urban (n=1327)	195 (14.7)	699 (52.7)	433 (32.6)	
Rural (n=582)	109 (18.7)	361 (62)	112 (19.2)	

Table 2 - The mean age of diagnosis compared to gender, location, and severity of mental retardation.

Variable	Age of diagnosis	P-value
Gender		0.509
Female	9.6 ± 2.4	
Male	9.7 ± 2.5	
Location		0.001
Urban	9.5 ± 2.3	
Rural	10.2 ± 2.6	
Severity		0.001
Borderline	8.8 ± 2.0	
Mild	9.9 ± 2.4	
Severe	10.5 ± 2.8	

Table 3 - The prevalence of mental retardation (MR) by location and gender.

Variable	Urban	Rural	P-value
Male			
Population	13511	65445	
MR population	836	358	
Prevalence (%)	61.9	5.4	0.001
Female			
Population	12862	65608	
MR population	491	224	
Prevalence (%)	38.2	3.4	0.001

(p=0.001 for all). When the mean age at diagnosis was compared with gender, location, and severity of MR, a statistical difference was found in location and the severity of MR (p=0.001), where no significance was encountered in comparison with gender (**Table 2**). The distributions of cases when compared with location and gender are given in **Table 3**. When the gender of the cases was compared with the location, the MR prevalence was statistically significant in the male and female urban population (p=0.001 for both).

Discussion. The effect of MR on individuals and societies has been underestimated in developing countries, and there are limited reports from this part of world although it is likely to be more important. Previous studies have consistently shown that individuals from low socioeconomic status and rural areas are over represented among those with mild MR.[10,17,18] Some investigators have even suggested that mild MR rarely occurs among individuals from the upper socioeconomic groups unless other underlying neurological conditions are present. Socioeconomic status of individuals alters according to various factors such as their education, job, and position at workplace. Status of children and housewives however, is defined according to the job of the father. Unfortunately, comprehensive data on socioeconomic status of individuals in our study does not exist in database of LDGRC. Thus, the status of the patients has been roughly pointed out according to their living area. It was stated in the Census of Population 2000 that the annual income of individuals living in the urban area of Zonguldak province was higher than the rural area.[16] Data on migration of individuals are also an important issue. However, the database of LDGRC does not include information on this topic either. These 2 parameters seem to be the limitations of this study, and we suggest that the database of centers as LDGRC should include such detailed information. Even though LDGRC is located in Zonguldak city and the guidance service is more reachable by those who live in the urban area, mild MR was established more in the rural population in our study. This was in accordance with previous studies.[9,10,13,14] In addition, borderline cases were lower in rural areas. After primary education, most people work in laboring jobs or in agriculture and those borderline cases might be neglected in the rural educational system and then might enter the work force. This may explain why the borderline MR was lower in rural areas. It has been reported that the prevalence of MR was 14.2 per 1000 in children aged 6-16 years.[4] In our study, the prevalence was 12.1 per 1000 in children for the age group 6-18. Although, the other neurological disorders, which affect the children before the age of 6 might be excluded, the prevalence

was likely to be matched with other cultures. The age of diagnosis between male and female cases was not statistically different. This finding would suggest that both genders have equal opportunities; unfortunately, the total number of cases from both genders was different. This might reflect the fact that more female cases could be diagnosed if they attended primary school and both genders do not have the same educational opportunities in the Turkish educational system as the parents might give preference to their son over their daughter. In Turkey, the ratio of attendance to primary school is different for both genders (87.8% for female, 93.6% for male),[16] although it is compulsory for all.

The age of diagnosis was statistically significant between rural and urban cases in our study. As earlier explained, the expectations of a child were greatly different in rural areas compared to urban ones. The child would mostly help his/her family to increase their income. Thus, education and finding this disability might be overlooked by his/her family. In addition, borderline cases could be tolerated in rural society as they are expected to work as manual laborers. However, families have much great expectations of their children in urban society. The adverse findings between the severity of MR and the age of diagnosis would be the result of the attitudes of families that the greater the severity of the MR, the easier was the acceptance of this condition by the families. As all the data came from the administrative data of LDGRC, most families who had a son or daughter with severe MR, did not seek help from this center till their child reached an older age. Although the general rural population is much higher, the incidence of MR was significantly higher in the urban population compared to the rural. As a result of the socioeconomic status of rural society, the severe and borderline cases might not be well documented by LDGRC. Those cases would be either ignored or covered by their parents to protect their child and family. Therefore, those children who had borderline or severe MR would either work in laboring jobs or live at home without any outside contact.

Most individuals with severe MR become enrolled in the service system during early childhood, but children with mild MR, especially those with no other neurological impairments, may never enter the system or may not do so until puberty.[9] Most of our cases were diagnosed between the ages of 6 and 10. This proves

the importance of school guidance of learning disability and their collaboration with the LDGRC.

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