

Original Article

Epidemiological Survey on the Status of Obsessive-Compulsive Disorder among School-Age Children in IranMarzieh Assareh¹ Reza Tabrizi² Mahboubeh Firouzkouhi-Moghaddam³ *Tayebeh Rakhshani⁴

1- Department of Child and Adolescent Psychiatrist, School of Medicine, Alborz University of Medical Sciences, Karaj, Iran

2- Health Policy Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

3- Department of Child and Adolescent Psychiatry, Research Center for Children and Adolescents Health, Zahedan University of Medical Sciences, Zahedan, Iran

4- Department of Public Health, School of Health AND Research Center for Health Sciences, Shiraz University of Medical Sciences, Shiraz, Iran

*trakhshani@gmail.com

(Received: 28 Jul 2015; Revised: 10 Oct 2015; Accepted: 1 Nov 2015)

Abstract

Background and purpose: The age of the onset of obsessive-compulsive disorder (OCD) and its manifestation is now identified at childhood. In the present study, we aimed to epidemiologically assess OCD and its main determinants in school-age children.

Materials and Methods: This cross-sectional study was performed on 600 consecutive school-age children (7-12 years old) in primary schools at Kermanshah, Iran in May 2012. OCD status was assessed using the Maudsley Obsessive Compulsive Inventory.

Results: In this study, the prevalence of OCD in children were 12.2% (73 person). Among OCDs, 32.0% were male and 68.0% were female with a significant difference ($P < 0.001$). Among different subscales of OCD, checking was more prevalent in girls than in boys (74.0% vs. 65.0%, $P < 0.001$), whereas doubting was more revealed in boys than in girls (56.0% vs. 34.0%, $P < 0.001$). In this regard, no differences were found between boys and girls in the rate of washing subscale (43.0% vs. 40.0%, $P = 0.456$) and slowness domain (30.0% vs. 34.0%, $P = 0.294$). Totally, mean MOCI score was significantly a higher in girls than in boys in different grades of education. OCD was influenced by father's occupation status, parents' education level, order of birth, dependence to mothers and previous history of OCD in fathers.

Conclusion: The prevalence of OCD was a higher than other areas in the country and other populations. Because of the existence of OCD potential determinants including socioeconomic level and familial tendency, the high prevalence of the disease must be considered in correlation with these factors.

[Assareh M, Tabrizi R, Firouzkouhi-Moghaddam M, *Rakhshani T. **Epidemiological Survey on the Status of Obsessive-Compulsive Disorder among School-Age Children in Iran.** *Iran J Health Sci* 2015; 3(4): 1-7] <http://jhs.mazums.ac.ir>

Key words: Obsessive-Compulsive Disorder, Children, School, Age, Determinant

1. Introduction

Obsessive-compulsive disorder (OCD) is an anxiety disorder characterized by uncontrollable, undesirable thoughts and reiterative, compelling the patients to perform ritualized behaviors and repetitious actions (1). OCD is manifested by recurrent vigorous obsessions and compulsions that leading severe inconvenience and interfere with daily functioning. Obsessions are also evidenced by recurrent and insistent thoughts or impulses that are obtrusive and create severe and irritating anxiety or distress (2). Regarding onset of initial manifestations of the disease, OCD frequently appeared in children and young adolescents so that about one-third to one-half can be developed the disorder during childhood (3). Studies have reported the modal age of disease onset at 7 years old with the average age of 10.2 years (4). This phenomenon affects as many as 1 in 200 children and adolescents; however, this rate can be potentially influenced by correct and proper diagnosis, because of ambiguous and unexpected onset of illness (5,6). In this regard, in most of the cases, the disorder may be unrecognized in these age groups. OCD has also various features in different subgroups of children and adolescents that in children; it can be appeared as the thoughts of harming by others and in older children as the thoughts of being sick (7). OCD is even known as a major cause of suicide in severe cases that about 10% of the affected patients make suicide attempts in young ages (8). Furthermore, the appearance of the disease in young ages can be accompanied with impairment in homework, attention in class, and school attendance (9). Therefore, understanding and identifying specifications and various aspects of the disease within childhood in each population is important and even vital. In our country, there are a few published data on the status of OCD in adolescents. In a study by Shams et al. (10), the prevalence of OCD symptoms was found to be 11.2% for the total sample in the age range 14-18 years. Vaziri (11). Furthermore, the prevalence of OCD

showed as 9.0% in the age range 7-17 years (0.8% in boys and 1.1% in girls).

According to different results in various areas and also, there are not adequate studies about prevalence and factors causing OCD in Kermanshah, the present study was done to assess epidemiologically OCD and its main determinants among school-age children in a great province in the western Iran.

2. Materials and Methods

This is a cross-sectional study. To determine a general level of accuracy in present study for calculating sampling size (SS) have used percentage 50% as the prevalence of OCD (P), confidence level (Z) 95%, margin of error (ME) 0.04 using the following formulae:

$$SS = (Z^2 * P(1 - P)) / (ME^2).$$

Based on this formula was selected 600 consecutive school-age children (300 boys and 300 girls in the age range of 7-12 years) in primary schools at Kermanshah, Iran in May 2012.

The samples were selected using stratified multi-stage random sampling from three regions of the city (10 schools in each region). The distribution of the schools was considered uniformly in all regions, and thus subjects were selected from all areas of the regions. The baseline characteristics of the students were collected through interview with the students or families to obtain information on demographic characteristics, medical history, oral medication, educational level, and occupational state of the parents as well as order of birth in family, after describing the study and its aim for each participant and taking informed oral consent.

OCD status was assessed by using the Maudsley Obsessive-Compulsive Inventory (MOCI) (12). This tool comprises 30 true/false items that refer to obsessive and/or compulsive symptoms in four domains of checking, cleaning, doubting, and slowness. A total score can be obtained by summing across all items (range 0-30). The total scale of the

questionnaire has been shown to have good test-retest reliability, internal consistency, known-groups validity, and convergent and discriminant validity in international studies. This test has been translated and used in previous studies in Iran (13,14).

Results were presented as mean ± standard deviation for quantitative variables and were summarized by absolute frequencies and percentages for categorical variables. Continuous variables were compared using t-test or non-parametric Mann–Whitney U-test. Categorical variables were compared based on chi-square test or Fisher’s exact. For the statistical analysis, the statistical software SPSS for windows (version 20, SPSS Inc., Chicago, IL, USA) was used. P values of 0.05 or less were considered statistically significant.

3. Results

In total, 73 children (50 girls and 23 boys) were suspected to OCD with the total prevalence rate of 12.2%. Among OCDs, 32.0% were male and 68.0% were female with a significant difference (P < 0.001). Among different subscales of OCD, checking was more prevalent in girls than in boys (74.0% vs. 65.0%, P < 0.001), whereas doubting was more revealed in boys than in girls (56.0% vs. 34.0%, P < 0.001). In this regard, no differences were found between boys and girls in the rate of washing subscale (43.0% vs. 40.0%, P = 0.456) and slowness domain (30.0% vs. 34.0%, P = 0.294). In total, mean MOCI score was significantly higher in girls than in boys in different grades of education (Table 1).

Table 1. Status of obsessive-compulsive disorder on the scores of the Maudsley Obsessive-Compulsive Inventory

Subscale	Grade	Males* (n = 300)	Females* (n = 300)	P**
Checking	First grade	1.9 ± 1.6	1.8 ± 1.6	0.444
	Second grade	2.6 ± 2.0	2.8 ± 1.9	0.210
	Third grade	3.4 ± 1.8	3.0 ± 1.8	0.007
	Fourth grade	3.3 ± 2.0	3.2 ± 2.0	0.541
	Fifth grade	2.7 ± 1.8	2.4 ± 2.4	
Cleaning	First grade	2.9 ± 3.0	3.1 ± 2.2	0.352
	Second grade	3.3 ± 1.2	2.8 ± 2.2	< 0.001
	Third grade	3.5 ± 1.4	2.9 ± 2.3	< 0.001
	Fourth grade	3.4 ± 1.9	3.4 ± 2.3	0.999
	Fifth grade	3.7 ± 2.0	2.9 ± 1.9	< 0.001
Slowness	First grade	0.7 ± 0.9	1.9 ± 2.0	< 0.001
	Second grade	1.5 ± 1.9	2.4 ± 1.8	< 0.001
	Third grade	1.8 ± 1.4	0.8 ± 1.1	< 0.001
	Fourth grade	3.3 ± 1.2	1.5 ± 1.4	< 0.001
	Fifth grade	3.3 ± 1.9	1.0 ± 1.5	< 0.001
Doubting	First grade	1.4 ± 1.1	2.6 ± 1.3	< 0.001
	Second grade	11 ± 1.7	2.0 ± 1.7	< 0.001
	Third grade	2.9 ± 2.2	1.7 ± 1.8	< 0.001
	Fourth grade	2.2 ± 1.5	2.0 ± 2.4	0.221
	Fifth grade	1.2 ± 1.0	2.2 ± 1.4	< 0.001
Total the score of OCD	First grade	7.0 ± 3.2	8.0 ± 4.9	0.003
	Second grade	9.0 ± 4.1	10.0 ± 3.1	< 0.001
	Third grade	9.0 ± 5.0	9.0 ± 4.0	0.999
	Fourth grade	7.0 ± 3.9	11.0 ± 4.1	< 0.001
	Fifth grade	8.0 ± 4.9	9.0 ± 5.0	0.014

*Data are mean ± SD. **P values derived from T-test or non-parametric Mann–Whitney U-test. OCD: Obsessive-compulsive disorder, SD: Standard deviation

Table 2. Prevalence of obsessive-compulsive disorder according to the baseline characteristics in both genders

Item	Level	Males* (n = 300)	Females* (n = 300)	P**
Education grade	First grade	60 (20)	75 (25)	0.143
	Second grade	60 (20)	63 (21)	0.762
	Third grade	84 (28)	27 (9)	< 0.001
	Fourth grade	48 (16)	72 (24)	0.817
	Fifth grade	48 (16)	63 (21)	0.115
Father occupation	Unemployed	39 (13)	69 (23)	0.001
	Worker	39 (13)	105 (35)	< 0.001
	Employed	102 (34)	33 (11)	< 0.001
	Self-employed	54 (18)	42 (14)	0.181
Father education	Military	63 (21)	51 (17)	0.212
	Illiterate	51 (17)	78 (26)	0.007
	Primary	81 (27)	48 (16)	< 0.001
	Secondary	27 (9)	66 (22)	< 0.001
	High school	39 (13)	24 (8)	0.046
Mather education	Diploma	63 (21)	36 (12)	< 0.001
	College degree	39 (13)	48 (16)	0.297
	Illiterate	102 (34)	72 (24)	< 0.001
	Primary	78 (26)	120 (40)	< 0.001
	Secondary	27 (9)	30 (10)	0.677
Order of birth	High school	51 (17)	24 (8)	< 0.001
	Diploma	27 (9)	30 (10)	0.677
	College degree	15 (5)	24 (8)	0.136
	First	102 (34)	90 (30)	0.294
Order of birth	Second	78 (26)	84 (28)	0.581
	Third	78 (26)	42 (14)	< 0.001
	Fourth or higher	42 (14)	90 (30)	< 0.001

*Data are number (%). **P values derived from chi-square or Fisher's exact. OCD: Obsessive-compulsive disorder

The difference in the prevalence rate of OCD between the two genders was significantly revealed in third grade of school education (Table 2).

The sex difference in the rate of OCD was associated with the fathers' occupational state so that the prevalence of OCD in girls with unemployed or worker fathers was higher than the boys while OCD was a more prevalent in employed fathers compared with girls without employed fathers. The difference in the rate of OCD was significantly associated with the educational level of the parents. The prevalence of OCD in the boys with less-educated fathers was higher than the girls with fathers with similar education levels, while OCD was more seen in girls with high-educated mothers in comparison with boys

with high-educated mothers. Regarding correlation of order of birth with OCD no significant difference was revealed in the prevalence of OCD between the first and also between the second sons and daughters of the families, however, the rate of the disease was higher in the third son of the families than in the third daughter of the families and besides; the prevalence of OCD was significantly higher in the fourth daughter of the family than in the fourth son of the family. Girls with the Fathers suffered from OCD had a higher prevalence of OCD compared to boys with fathers with the previous history of OCD (54.0% vs. 20.0%, $P < 0.001$). Furthermore, dependence on mothers was associated with the higher prevalence of OCD in girls than in boys (33.0% vs. 18.0%, $P < 0.001$).

4. Discussion

The present study achieved a rate of 12.2% for the prevalence of OCD in school-age children that was meaningfully higher in females than in males aged 7-12 years indicating the considerable higher prevalence of this phenomenon in our young population with the different gender pattern.

A number of epidemiological studies and school surveys have reported a prevalence rate of pediatric OCD varying between 2% and 4% with a mean age of onset between 7.5 and 12.5 years (15). Hirschtritt et al. found in an adolescent epidemiologic study, a lifetime prevalence of 1.3%. It has been suggested that OCD follows bimodal distribution of incidence in childhood and adulthood (16). Regarding gender distribution, Geller in the same article, reports a 3:2 boys to girls ratio in children; older adolescents follow the adult pattern of equal distribution or slight female preponderance (6). Besides, according to the US National Comorbidity Survey Replication by Kessler et al. (17,18). About 20% of all affected persons in the USA suffer from manifestations of the disorder at age 10 or even earlier. Delorme et al. Consider the disorder to have a bimodal age distribution, with a first peak at age 11 and a second one in early adulthood (19). Among the affected children, there seem to be more boys than girls, in a ratio of about 3:2, although this has not been confirmed in all of the relevant studies (20). In total, the overall prevalence of OCD in our young population was considerably high with a higher rate in girls than in boys. What seems to be the highlight in our study is different pattern of OCD in the two genders so that among different subscales of OCD, checking was more prevalent in girls than in boys, whereas doubting was more revealed in boys than in girls. Because body dissatisfaction seems to be more prevalent in females than in males (21), higher rate of body checking as the main components of OCD in females than in males is not

unexpected. Besides, males showed faster reactions and less accuracy at work and thus doubting may be more expected in boys compared with girls (22).

We also showed that the overall prevalence of OCD was influenced by father's occupation status, parents' education level, order of birth, dependence to mothers and previous history of OCD in fathers. On the other hand, both genetic factors and also environmental parameters such as socioeconomic states can potentially affect the chance of OCD. Steinhausen et al. found that, in parents of children with severe OCD, 25% of the fathers and 9% of the mothers had the illness themselves explaining more prevalence of OCD in those boys with affected fathers (23). In total, association between low socioeconomic level and a higher rate of OCD in children has been clearly determined (24).

In this regard, because of the close relationship between the socioeconomic status of the family and psychological conditions in family members, the influence of the parent's social activities and occupational state on the appearance of OCD in children is well suggested.

It can be finally concluded that the prevalence of OCD was partially higher than other areas in the country but considerably higher than other populations. Because of the existence of OCD potential determinants including socioeconomic level and familial tendency, the high prevalence of the disease must be considered in correlation with these factors.

This study similar other studies have some limitations such as; due to cultural reasons, there was no possibility of follow-up for people who did not non-cooperative cases. Another, since the some interviews were conducted based on parents' responses, so the prevalence of OCD would be underestimated.

We were performed the present study in the city of Kermanshah, and since the results of the study affected areas, hence

generalizability of the results must be considered with cautiously. Obviously, further surveys in different parts of the larger sample can clarify this subject.

Conflict of Interests

The Authors have no conflict of interest.

Acknowledgement

This study was done with the approval of the Research Deputy of Kermanshah University of Medical Sciences, Iran. This was extracted from the general physician thesis. Authors would like to thank the students and parents who cooperated in conducted data this study with us.

References

- Leonard HL, Ale CM, Freeman JB, Garcia AM, Ng JS. Obsessive-compulsive disorder. *Child Adolesc Psychiatr Clin N Am* 2005; 14(4): 727-43, viii.
- Bloch MH, Landeros-Weisenberger A, Rosario MC, Pittenger C, Leckman JF. Meta-analysis of the symptom structure of obsessive-compulsive disorder. *Am J Psychiatry* 2008; 165(12): 1532-42.
- Huyser C, Veltman DJ, de Haan E, Boer F. Paediatric obsessive-compulsive disorder, a neurodevelopmental disorder? Evidence from neuroimaging. *Neurosci Biobehav Rev* 2009; 33(6): 818-30.
- Kalra SK, Swedo SE. Children with obsessive-compulsive disorder: are they just "little adults"? *J Clin Invest* 2009; 119(4): 737-46.
- Yuce M, Zoroglu SS, Ceylan MF, Kandemir H, Karabekiroglu K. Psychiatric comorbidity distribution and diversities in children and adolescents with attention deficit/hyperactivity disorder: a study from Turkey. *Neuropsychiatr Dis Treat* 2013; 9: 1791-9.
- Geller DA. Obsessive-compulsive and spectrum disorders in children and adolescents. *Psychiatr Clin North Am* 2006; 29(2): 353-70.
- Butwicka A, Gmitrowicz A. Symptom clusters in obsessive-compulsive disorder (OCD): influence of age and age of onset. *Eur Child Adolesc Psychiatry* 2010; 19(4): 365-70.
- Mancebo MC, Garcia AM, Pinto A, Freeman JB, Przeworski A, Stout R, et al. Juvenile-onset OCD: clinical features in children, adolescents and adults. *Acta Psychiatr Scand* 2008; 118(2): 149-59.
- Mataix-Cols D, Nakatani E, Micali N, Heyman I. Structure of obsessive-compulsive symptoms in pediatric OCD. *J Am Acad Child Adolesc Psychiatry* 2008; 47(7): 773-8.
- Shams G, Foroughi E, Esmaili Y, Amini H, Ebrahimkhani N. Prevalence rates of obsessive-compulsive symptoms and psychiatric comorbidity among adolescents in Iran. *Acta Med Iran* 2011; 49(10): 680-7.
- Vaziri Sh. The epidemiology of obsessive-compulsive disorder in Iranian children and adolescents. *Iran J Psychiatry Clin Psychol* 2007; 2(7): 99-105. [In Persian]
- Foa EB, Huppert JD, Leiberg S, Langner R, Kichic R, Hajcak G, et al. The obsessive-compulsive inventory: development and validation of a short version. *Psychol Assess* 2002; 14(4): 485-96.
- Mataix-Cols D, Lawrence NS, Wooderson S, Speckens A, Phillips ML. The Maudsley Obsessive-Compulsive Stimuli Set: validation of a standardized paradigm for symptom-specific provocation in obsessive-compulsive disorder. *Psychiatry Res* 2009; 168(3): 238-41.
- Lim JS, Kim SJ, Jeon WT, Cha KR, Park JH, Kim CH. Reliability and validity of the Korean version of Obsessive-Compulsive Inventory-Revised in a non-clinical sample. *Yonsei Med J* 2008; 49(6): 909-16.
- Stoylen IJ, Larsen S, Kvale G. The Maudsley Obsessional-Compulsive Inventory and OCD in a Norwegian nonclinical sample. *Scand J Psychol* 2000; 41(4): 283-6.
- Hirschtritt ME, Lee PC, Pauls DL, Dion Y, Grados MA, Illmann C, et al. Lifetime prevalence, age of risk, and genetic relationships of comorbid psychiatric disorders in Tourette syndrome. *JAMA Psychiatry* 2015; 72(4): 325-33.

17. Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, Walters EE. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry* 2005; 62(6): 593-602.
18. Kessler RC, Chiu WT, Demler O, Merikangas KR, Walters EE. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry* 2005; 62(6): 617-27.
19. Delorme R, Golmard JL, Chabane N, Millet B, Krebs MO, Mouren-Simeoni MC, et al. Admixture analysis of age at onset in obsessive-compulsive disorder. *Psychol Med* 2005; 35(2): 237-43.
20. Chabane N, Delorme R, Millet B, Mouren MC, Leboyer M, Pauls D. Early-onset obsessive-compulsive disorder: a subgroup with a specific clinical and familial pattern? *J Child Psychol Psychiatry* 2005; 46(8): 881-7.
21. Schneider S, Weiss M, Thiel A, Werner A, Mayer J, Hoffmann H, et al. Body dissatisfaction in female adolescents: extent and correlates. *Eur J Pediatr* 2013; 172(3): 373-84.
22. Lochner C, Hemmings SM, Kinnear CJ, Moolman-Smook JC, Corfield VA, Knowles JA, et al. Corrigendum to "gender in obsessive-compulsive disorder: clinical and genetic findings" [*Eur. Neuropsychopharmacol.* 14 (2004) 105-113]. *Eur Neuropsychopharmacol* 2004; 14(5): 437-45.
23. Steinhausen HC, Bisgaard C, Munk-Jorgensen P, Helenius D. Family aggregation and risk factors of obsessive-compulsive disorders in a nationwide three-generation study. *Depress Anxiety* 2013; 30(12): 1177-84.
24. Heyman I, Fombonne E, Simmons H, Ford T, Meltzer H, Goodman R. Prevalence of obsessive-compulsive disorder in the British nationwide survey of child mental health. *Int Rev Psychiatry* 2003; 15(1-2): 178-84.