Abstract

Background: Children with specific learning disabilities are at a greater risk of mental health problems than their non-disabled peers. Further interventions and research will be required. **Methods:** This is a cross-sectional study. A sample of 107 students (7 to 11 years old) with specific learning disabilities were randomly selected from educational and rehabilitation settings in Tehran. The Child Symptom Inventory-4 (parent form) was administered.

Results: Among children studied, 86 subjects (82.8%) in some of the categories of psychiatric symptoms gained scores above the cut-off point. The most prevalent psychiatric symptoms were related to attention-deficit/hyperactivity disorder, generalized anxiety disorder and oppositional defiant disorder. There were not any statistically significant differences between the genders. In addition to direct education, 15 subjects (14%) were receiving medication, 2 subjects (1.9%) were receiving only occupational therapy, 2 subjects (1.9%) were receiving only speech therapy, and 5 subjects (4.7%) were receiving both occupational and speech therapy.

Conclusion: The emphasis on considering co-morbid symptoms and usage of mental health services are important issues for students with specific learning difficulties.

Keywords: *Child Symptom Inventory-4, mental health services, Specific Learning Disabilities*

Introduction

Specific learning disability (SLD) is a neuro-developmental disorder that commonly starts during initial years of formal schooling. SLD disrupts the normal pattern of learning academic skills and is not a consequence of lack of opportunity of learning (*American Psychiatric Association,* 2013). Learning disability is a diagnostic category in exceptional education in Iran. The prevalence of SLD in school-aged children is reported 4.58-7% in Iran (Bahramabadi & Gangi, 2014; Behrad, 2005) and 5-15% across different languages and cultures (*American Psychiatric Association,* 2013). There are various definitions of learning disabilities, but they have several elements in common: neurological factors, cognitive processing factors, difficulty in academic and learning tasks, discrepancy between potential and achievement, and exclusion of other causes (Fletcher, Coulter, Reschly, & Vaughn, 2004; Lerner & Johns, 2011). SLD is not primarily a result of other conditions, such as mental retardation; emotional disturbance; behavioral disorders; visual or hearing impairments; or cultural, social, and economic environments. In practice, however, the exclusion component of the definition of SLD is difficult to implement because children often exhibit co-occurring problems. Studies on students with SLD report psychiatric co-morbidities. In a survey-based research study by Emerson and Hatton, 39% of 5-15 year old British children with SLD had diagnosable mental health problems, compared to 8% among children without SLD (2007). These co-morbidities make diagnosis, assessment and treatment more difficult because each of them independently interferes with the execution of daily living activities, including learning (*American Psychiatric Association,* 2013).

Most studies on subgroups of SLD focus on reading disorder, the most common and best defined subgroup of the SLD, and co-morbidity with attention deficit hyperactivity disorder (ADHD) (Shaywitz, Fletcher, & Shaywitz, 1995). All of their findings demonstrate high co-morbidity of SLD with ADHD and other disruptive behavioral disorders (August & Garfinkel, 1990; Bahramabadi & Gangi, 2014; Cantwell & Baker, 1991; DuPaul, Gormley, & Laracy, 2012; Germano, Gagliano, & Curatolo, 2010; Semrud-Clikeman et al., 1992; Willcutt & Pennington, 2000a). Willcutt and Pennington indicated that reading disorder is associated with significant elevations on all measures of internalizing and externalizing symptoms (2000). Moreover, students with reading disorder were significantly more likely to meet criteria for categorical diagnoses of ADHD, oppositional defiant disorder (ODD), conduct disorder (CD), anxiety disorder (AD), and depression when compared to students without reading disorder (Willcutt & Pennington, 2000b). The component of ‘exclusion of other causes’ in the definition of SLD reflects the notion that these co-morbid symptoms have a serious effect on learning ability. Several mental health services will be needed to address co-morbid symptoms. In co-occurrence of other problems with SLD, diagnosis is difficult and tricky. In such instances, improvement in academics will demand comprehensive holistic treatment approach (Sahoo, Biswas, & Padhy, 2015). Even with a lack of co-morbid symptoms, multidisciplinary interventions such as occupational therapy, speech therapy, and sometimes medication in SLD patients are essential (Bernard & Turk, 2009). In speech therapy, the emphasis of therapy for a person with SLD may be the reduction of social and communicative barriers, while in occupational therapy, it may be on limitations in performance affecting self-care, education and play (Enderby, John, & Petheram, 2006). It is also recognized that children with SLD are less likely to have access to appropriate mental health services. Even children who have appropriate access are less likely to have their psychiatric and developmental needs recognized, understood and addressed in an evidence-based and optimally therapeutic fashion (Bernard & Turk, 2009). The majority

of studies on mental health services for SLD use adult samples (Hoffmann et al., 1987; Levinson & Ohler, 1998; Mull, Sitlington, & Alper, 2001; Ysseldyke, Algozzine, Richey, & Graden, 1982). Emerson and Hatton's research in Britain showed that just about half of the families of children with SLD reported that they had received no helpful support from services (2007).

In Iran, typically, a student having some criteria of SLD will be referred to The Centers of Education and Rehabilitation for Specific Learning Difficulties. These centers of SLD are dependent to the Exceptional Students Organization. The students in these centers will receive direct education with focus on cognitive and behavioral approaches. In administrative regulation of SLD centers, the main purposes are increasing the academic achievement and providing essential diagnostic, educational and rehabilitative services to the students with SLD (Exceptional Students Organization, 2007). Unlike the administrative, regulation mentions that the specialists such as occupational therapists and speech therapists can work in SLD centers, these services are not provided. Coupled with this, differential diagnosis and co-morbid disorders have not been examined by a child psychiatrist. Therefore, exact attitude to mental state of students with SLD and mental health services students receive are considerable. Until the time of writing this paper, no reports were found about mental health services SLD students received.

Therefore, the researchers sought out to evaluate the frequency of psychiatric symptoms and received treatment services by students with SLD who were referred to The Centers of Education and Rehabilitation for Specific Learning Difficulties.

Material and Methods

Study design

In this cross-sectional study, 107 elementary school students (66 boys and 41 girls) with SLD were selected using convenience sampling method from four SLD centers (The Centers of Education and Rehabilitation for Specific Learning Difficulties) in Tehran, Iran in 2015. The students had been referred to SLD centers and assessed by expert psychologists. The inclusion criteria included confirming diagnosis of SLD by the Wechsler intelligence scale for children® - fourth edition (WISC-IV) and teacher-created tests based on school textbooks (Exceptional Students Organization, 2007; Wechsler, 2003); the age between 7-12 years; the literacy and mental health of parents for reading and optimal comprehension of the questionnaire; and the cooperation of parents for completing the questionnaires of the Child Symptom Inventory-4 (CSI-4) items and demographic information. The participants were excluded if the questionnaires were incomplete. Informed consent was obtained from all the participants. This study was approved by the ethics committee of Iran University of Medical Sciences.

Instrument

The checklist of CSI-4 was used. It is a screening instrument for behavioral and emotional symptoms of many children's disorders based on the Diagnostic and Statistical Manual of Mental Disorders-fourth edition (DSM-IV) with two forms: parent-report and teacher-report. It screens 5 to 12 year olds. The CSI-4 can be completed in 10 minutes. The Parent Checklist contains 97 items covering 17 disorders, while the Teacher Checklist contains 77 items related to 13 disorders (Gadow & Sprafkin, 1997).

Psychometric characteristics (validity, reliability and cut-off scores) of Persian version of CSI-4 had been approved in previous studies (Alipour & Mohammad-Esmail, 2004). The results of psychometric evaluations indicated that the Parent form has more sensitivity and specificity than the teacher form. However, due to insufficient diagnostic sample size, determining cut-off points for three disorders (schizophrenia, asperger syndrome and post-traumatic stress disorder) was impossible. Therefore, in this study, the parent checklist of CSI-4 was used and 14 categories of disorder symptoms were examined including ADHD, ODD, CD, dysthymia, depression, separated anxiety disorder (SAD), generalized anxiety disorder (GAD), obsessive-compulsive disorder (OCD), social phobia, specific phobia, motor tic disorder, vocal tic disorder, enuresis and encopresis. A teacher or a parent rates each item on a 4-point Likert scale, indicating how often the symptom is observed in the child being evaluated. Likert scale consists of four choices: 'never,' 'sometimes,' 'often,' and 'almost always.' The scoring procedures for screening include counting the symptoms (categorical model) with the score of 0 for 'never/sometimes,' and the score of 1 for 'often/almost always' (Alipour & Mohammad-Esmail, 2004; Gadow & Sprafkin, 1997). Some demographic questions were added to this checklist. After completing the CSI-4, an interview based on the DSM-IV criteria was done for investigating the precision of the parents in comprehension of the checklist items.

Statistical analysis

Continuous and categorical variables are presented as mean ± standard deviation (SD) and frequency (percent), respectively. The association between the gender and occurrence of psychiatric symptoms was assessed using T-test and Chi square tests. The statistical analyses were done using SPSS 19. Significant level was determined to be less than 0.05.

Results

The mean age of the subjects was 8.46±1.26. The majority of participants (61.7%) were boys, and 38.3% were girls. In terms of school grade the subjects consisted of 28% from first grade, 27.1% from second grade, 21.5% from third grade, 16.8% from fourth grade, and 6.5% from fifth grade. There were no students in sixth grade among the subjects. As the figure 1 displays, the most crowded subgroup of SLD was dyslexia plus dysgraphia and the least crowded was dyslexia alone.

Only in 21 subjects (17.2%) reported no symptoms. In addition to diagnosis of SLD, 86 subjects (82.8%) reported symptoms of other psychiatric disorders above the cut-off point of CSI-4. 27 subjects (23.9%) reported more than five co-morbid categories of psychiatric symptoms (figure 2).

The most prevalent psychiatric symptoms were related to ADHD (especially inattentive type), GAD and ODD (Table 1).The occurrence of symptoms between genders analyzed and findings are shown in Table 1. As shown, the two most prevalent symptoms in boys were related to ADHD and ODD. In girls, the most frequent symptoms were related to ADHD, and then GAD, SAD, and specific phobia had similar frequencies. Each category of symptoms was compared between two genders and no statistically significant differences were found (Table 1).

86 subjects (80.4%) were seen by a psychiatrist; 15 subjects (14%) took drugs for ADHD (inattentive, hyperactive or mixed type), and 6 subjects (5.6%) took drugs for anxiety. Rehabilitative services the subjects were receiving included occupational therapy and speech therapy. The number of subjects receiving these services included 2 (1.9%)

for occupational therapy, 2 (1.9%) for speech therapy and 5(4.7%) for both occupational and speech therapy. 98 subjects (91 .6%) received no services.

Discussion

This study investigated the prevalence of psychiatric symptoms and mental health services in 7-12 year-old students with SLD who were referred to all The Centers of Education and Rehabilitation for Specific Learning Difficulties. The current study shows that the most students of SLD centers met criteria for other psychiatric symptoms. Despite this, few subjects were receiving mental health services. There were some differences between genders that were not significant.

The findings suggest that a large percentage of students in SLD centers have co-morbid psychiatric symptoms. This provides further replication of numerous previous studies. In Cantwell and Baker's study, 74% of children with SLD were diagnosed as having some type of psychiatric disorders (1991). However, the overall frequency of any psychiatric disorders of normal children in Tehran has been reported at 17.9% (Alavi, Mohammadi, Joshaghani, & Mahmoudi-Gharaei, 2010). Willcut and Pennington investigated the psychiatric problems of children with SLD by a behavior checklist in the form of internalizing and externalizing disorders and indicated that these children exhibited high rates of all types of behavioral and emotional disorders (2000b). As noted in the current study's results, about a quarter of the sample had more than five categories of symptoms. Previous research showed that over 60% of children with SLD met the criteria for at least one additional diagnosis (Willcutt & Pennington, 2000a, 2000b). Children with co-morbid problems have more secondary problems, such as low self-esteem, behavioral problems, dropping out of school, and a worse outcome compared with children diagnosed with only one disorder (Germano et al., 2010). The first step for preventing secondary problems is screening of the symptoms in the school or the SLD center. Questionnaires such as CSI-4 that gather information in a way that is compatible with the diagnostic system (DSM-IV) improve communication between the parents/school and the mental health practitioners.

The findings revealed that the symptoms of ADHD, GAD and ODD were the most common symptoms in students from the SLD centers. The co-morbidity of SLD and disruptive behavior disorders (ADHD, ODD and CD) has been previously discussed. August and Garfinkel; Willcut and Penington; Germano, Gagliano and Curatolo; and Cantwell & Baker confirmed the high rates of SLD and ADHD co-morbidity (1990; 2000a; 2010; 1991). In Cantwell and Baker's study, 40% of the children with SLD had ADHD, and 9% had ODD and CD (1991). Thus, a total of 49% of the children with SLD had a concurrent disruptive behavior disorder. Their findings in a follow up 4 to 5 years later showed a strong association between psychiatric disorders and SLD, in particular, between disruptive behavior disorders and SLD (Cantwell & Baker, 1991). There is strong support for interpreting co-morbidity. For example, ADHD in preschoolers as a diagnosis leads directly to learning difficulties at school age due to poor concentration on academic tasks. The reverse mechanism of association that problems with academic performance might lead to a clinical picture of ADHD in school age may also be true. Moreover, the co-morbidity of SLD and ADHD may be the result of a common pathology (Cantwell & Baker, 1991; Tannock & Brown, 2000). The important point is that the general clinical presentation in SLD with and without ADHD varies (Tannock & Brown, 2000). Therefore, clinicians should pay attention to distinguish

disorders for planning a comprehensive intervention between them. The category of CD symptoms did not have high rate in the studied samples, perhaps because CD symptoms are antisocial behavior and very obvious for the special education teachers. In the SLD centers when the disruptive behaviors are severe, a student is referred to as 'the department of behavioral disorders' of the Exceptional Student Organization. Thus students with CD symptoms were not presented in the SLD centers during sampling.

The symptoms of anxiety disorder were other common symptoms in the students in the current study. Anxiety in children with SLD is an important issue. A meta-analysis by Nelson and Harwood on fifty-eight studies on anxious symptomatology demonstrated that students with SLD had higher mean scores on measures of anxiety than did non-SLD students (2011). Cantwell and Baker found that anxiety disorder diagnoses increased from 2% to 25% after a 5-year follow-up (1991). Only one study found that its results showed no difference of anxiety symptoms between students with SLD and non-SLD students. Newcomer, Barenbaum, and Pearson measured anxiety with a self-report scale and a teacher rating scale and reported that students with SLD did not self-rate as more anxious than children without SLD; even the students' teachers believed that they were not more anxious than other students (1995). Perhaps the reason for this result is that Newcomer et al.'s study was comparative and statistically significant IQ differences between the SLD and non-SLD groups were the reason for such an outcome. The inconsistency between teachers' views in Newcomer et al.'s study compared with other findings may be due to the instruments had been used to measure the anxiety such as the number of items, formats, administration and scoring procedures that may influence the outcomes. Variations in subject characteristics may also affect the consistency of the results. The results suggest the need for the screening of possible anxiety in students with SLD and Treatment approaches for decreasing anxiety should be provided even as early intervention.

The current study's findings suggest that the most common symptoms between genders were different. The most frequent symptoms in boys were related to ADHD and ODD. In girls, most symptoms were related to ADHD, then GAD, SAD and specific phobia symptoms had the same prevalence. The current study's results are consistent of previous studies on SLD children. ADHD has been consistently shown as the most common problem for SLD in two genders (August & Garfinkel, 1990; Bahramabadi & Gangi, 2014; Semrud-Clikeman et al., 1992). The boys with SLD tend to exhibit high levels of externalizing behaviors, whereas girls with SLD exhibit higher levels of internalizing symptoms (Willcutt & Pennington, 2000b). In the current study, as well as Alavi, Mohammadi, Joshaghani and Mahmoudi's research, the difference of psychiatric symptoms between genders was not remarkable (2010). According to Lewinsohn, Gotlib, Lewinsohn, Seeley, and Allen; and Wren and Benson's studies, girls have been found to experience higher prevalence of anxiety disorders than males (1998; 2004). Anxiety rate will be increased after years (Cantwell & Baker, 1991). Therefore, precision understanding of experience of anxiety in students with SLD could potentially inform training needs.

As noted, children with SLD are at a greater risk of mental health problems than their non-disabled peers. In the clinical setting, more symptoms in the client will require more expertise by the therapist. Even when the only diagnosis is SLD, a multidisciplinary team consisting of mental health professionals is necessary to meet all the needs of children with disabilities (Fuchs, Mock, Morgan, & Young, 2003). The

required services for children with learning disabilities include cognitive and behavioral psychotherapies, family therapies, speech and language therapy, occupational therapy, medication, consultation (Bernard & Turk, 2009). In the SLD centers, the special education teachers provide direct education with cognitive and behavioral approaches. Hence, the researchers decided to find out what mental health services the current sample was receiving out of the SLD centers. In this process, the researchers found medication, occupational therapy and speech therapy were other services the students were receiving. The findings showed that 21 (15.6%) subjects were under supervision of psychiatrists and had drugs for ADHD or ADHD, plus anxiety. A few students (9 subjects) were receiving other mental health services consisting of occupational therapy and speech therapy. Until writing this paper, no researchers were investigating mental health services in students with SLD in Iran. In the United States, Simon, Pastor, Reuben, Huang, and Goldstrom's study indicated that 5.8% of school-aged children had serious psychiatric disorders, and 17.3% had minor disorders (2015). Among these children, 17.8% were receiving both medication and psychosocial (psychological and rehabilitative) services, 28.8% psychosocial services only, 6.8% medication only, and 46.6% neither medication nor psychosocial services (Simon et al., 2015). Therefore, received treatment services students with SLD in Tehran is not at optimal levels. Although the administrative regulation of the SLD centers allows occupational and speech therapists to work in these centers, their services cannot be used effectively. In this case, the students of these centers are less likely to access appropriate mental health services. The same is in other countries. For example, children with disabilities in the United Kingdom (UK) may not receive necessary services as well. When they do, they are less likely to have their psychiatric and developmental needs recognized, understood and addressed in an evidence-based and optimally therapeutic fashion. Child and Adolescent Mental Health Services (CAMHS) in the UK, in general, lack the expertise and resources required to provide comprehensive assessments and ongoing management for those with developmental disabilities (Bernard & Turk, 2009). Certainly, lack of treatment facilities for children with SLD will result in negative impact specially distress for family members (Simpson, Cohen, Bloom, & Blumberg, 2009).

Co-morbid problems in SLD predict poor academic skills. Behavioral/emotional deficits often appears in preschool and immediate intervention in co-morbidities with SLD is a necessity (Hinshaw, 1992). SLD is a mild disability, but mild does not mean not serious. A mild disability is very serious for the student, having significant effects on his or her learning and self-esteem when the student cannot do what everyone else finds easy (Boyle & Scanlon, 2010; Raymond, 2004). In general, when the emotional or behavioral problems put a burden on the family or interfere with the child's leisure activities, friendships and learning, the student is more likely to receive special education and mental health services than children whose problems do not influence these areas of life (Simpson et al., 2009). For the student, therefore, it will be better that the referral process to other mental health professionals starts promptly before co-morbid problems increase severity of learning difficulties. A final practical implication of our results relates to the training of professionals who work with children with SLD. Special education teachers should not only focus on instructional strategies for learning disability, but also on strategies for reducing other psychiatric symptoms. School counselors and psychologists should be trained to screen and treat other potential psychiatric problems in students with SLD. Professionals should be aware of this possibility that the SLD may be the result of emotional and behavioral symptoms.

An important limitation of this study is that the selected samples were chosen from only SLD centers of Tehran. The SLD centers were the only settings in which systematic assessment were conducted. All the students in the sample were referred to these centers and had similar evaluation processes. If there was a large sample with identical conditions in assessment and diagnosis, it would be possible to generalize the results to all the SLD population. Furthermore, examining co-morbid problems of SLD centers students in the form of disorders (not symptoms), and their comparison with SLD students who are treating in other centers such as private educational and rehabilitative centers will be useful. Identifying precise assessment processes for differential diagnosis between SLD and co-morbid disorders should perhaps be done first among these recommendations.

Conclusion

This is the first study to the authors' knowledge that has documented the mental status and service providers to students of the SLD centers of Tehran. The overall frequency of psychiatric symptoms in students with SLD who were referred to these centers was similar to that of previous studies. Category of symptoms related to ADHD, ODD and anxiety disorders were the most prevalent category of the symptoms. There were no significant differences between genders. A small percentage of students were using other mental health services in addition to the direct education provided in the SLD centers. However, there is still a need for further research in this area. The results emphasize clinical and educational attention to co-morbid symptoms following with pharmacological and psychosocial rehabilitative interventions for planning effective therapeutic services integrated with educational approaches to students with SLD.

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Conflicts of Interest The Authors declare that no competing financial interests exist.

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