

Behavioral and Emotional Problems Associated with Dyslexia in Adolescence

Mai Eissa

Department of Neuropsychiatry, Tanta Faculty of Medicine, Tanta, Egypt

ABSTRACT

- Introduction:** Adolescence is a period of stressful transition for youths who have reading difficulties and they may be at risk for emotional and behavioral problems.
- Aim of the Study:** Is to evaluate the reading difficulties among a group of adolescents and highlight the emotional and the behavioral symptoms associated with this difficulty.
- Subjects and Methods:** Thirty-five poor reader adolescents and 21 typical readers matching the patient group regarding age were included in the study. Poor readers were interviewed for the following themes; success or failure in school, feelings of well-being in school, the impact of dyslexia on school achievements, self-esteem, peer relations. Youths were given Youth Self-Report Inventory (YSR) that measure eight sub-scale symptoms: Withdrawn, somatic complaints, anxiety and depression, social problems, thought problems, attention problems, aggressive behavior and delinquent behavior. Hamilton rating scale of depression (HRSD) was used to assess the severity of depression and Hamilton rating scale of anxiety (HRSA) to assess the severity of anxiety.
- Results:** This study revealed that dyslexia had negatively influenced adolescents' self-esteem and caused them to feel different from others with poor school achievement and lower feeling of well-being. Dyslexic adolescents in this study also suffered from externalizing and internalizing symptoms withdrawal, somatic complaints, anxiety/ depression, social problems, thought problems, aggression and delinquent behavior that were significantly higher in poor than typical readers. They showed significantly higher scores of depression as assessed by HRSD and anxiety as assessed by HRSA.
- Conclusion:** The present study will help generate awareness about youth with dyslexia and result in their early identification and initiation of appropriate psychoeducational interventions, namely, remedial education for dyslexia and behavioral and medical management for associated emotional and behavioral symptoms.

Key words: Dyslexia, behavior problems, emotional problems, adolescence.

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INTRODUCTION

Developmental dyslexia is characterized by an unexpected difficulty in reading in children and adults who otherwise possess the intelligence, motivation and education considered necessary for accurate and fluent reading. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities¹. This disorder is remarkably common but with an uncertain prevalence rate, ranging from 5% to 17.5%². A genetic origin with a neurological basis is admitted now for this developmental disorder, but the precise etiology remains unknown³. Dyslexia occurs in all languages. Spelling disorder especially often persists into adulthood. Dyslexia is both familial and heritable⁴. Five theories were proposed to explain dyslexia. According to the "phonologic-deficit hypothesis", dyslexic children have difficulty developing an awareness that words, both written and spoken, can be broken down into smaller units of sound and that in fact, the letters constituting the printed word represent the sounds heard in the spoken

word³. The auditory processing deficit theory⁵ assumes that dyslexics have a deficit in rapid auditory processing. So, no adequate phonological representations can be built, resulting in additional phonological impairment. The visual processing deficit theory assumes that dyslexia arises from impairment of the magnocellular system in the brain⁶. This system supports the processing of rapidly moving visual stimuli. This results in blurred visual representation of letters. Attention deficits interfere with encoding of a sequence of letters and visual word form⁷. Finally the cerebellar/automatisation theory argues that reading disability is the consequence of the impaired ability to automatise processes supported by the cerebellum. Moreover the control of the eye movement during reading is controlled by the cerebellum⁸.

Adolescence is a period of transition that is stressful for youths who have reading difficulties. For example, adolescents with reading difficulties often find academic

demands frustrating because reading is the center of much of their coursework. They often have lowered self-esteem and decreased motivation to learn and experience embarrassment and anxiety in situations in which they are required to read or write. They drop out of school at higher rates than their peers without reading problems, may be less inclined to pursue postsecondary school education or training and often have fewer options as they plan for the future⁹.

In the Pittsburgh Youth Study, preteenage boys with poor reading reported more depressed mood than pre-teenage boys without reading problems; similar differences were not found among adolescent boys¹⁰. Others have reported that girls with reading disabilities (RD) evidence more depressive symptoms than youth without reading problems and that depressive symptoms among boys with reading problems are not as pronounced as those for girls¹¹. Children and adolescents specifically with reading difficulties also have been noted to score higher on measures of anxiety symptoms than youth without reading problems¹¹, particularly for girls. Somatic complaints have not been well studied among youth with reading problems, nevertheless. Youth with reading disabilities had more somatic complaints than both their peers in the community and their co-twins without reading problems¹². They speculated that "some children with RD develop physical symptoms such as headaches or stomachaches in their response to the stress of academic work".

Youth identified at age 5 with pervasive speech and language impairments or auditory comprehension problems evidence higher rates of teacher-rated externalizing behavioral problems at age 12 than youth with speech problems alone. Persistence of such problems was reflected in higher rates of antisocial personality disorder diagnoses at age 19 among males with language impairments relative to males with no speech or language impairment¹³. Both boys and girls with reading disability had more parent-reported aggressive and delinquent behaviors than youth without reading disability; however, the aggressive behaviors of reading disabled boys were more evident than those of reading disabled girls¹¹.

As the adolescent years present numerous challenges for young people with reading problems as they try to complete school and plan for the future, this study was designed to evaluate reading difficulties and its impact on a group of adolescents as well as to highlight the emotional and behavioural symptoms associated with dyslexia in them.

SUBJECTS AND METHODS

This study was done during the period from 15th September 2008 through 31st June 2009. Adolescents were typically referred by their parents or teachers because of concerns about learning or behavioral problems. All adolescents included in the study were in the age range 12-18 years and were required to have been previously diagnosed with a reading disability or were having significant difficulty learning to read. None of the adolescents had a history of seizures, head injury, birth trauma, prematurity, or severe

psychopathology. Additionally, none of the adolescents involved in the study had pre-existing diagnoses of anxiety or depressive disorders. Children start school at the age of 6 and primary school comprised the period of 6–11 years of age, intermediate school 12–14 years, secondary school 15–17 years. For participation in the study, a written informed consent was obtained from the parent, not to be in classes for educable people with mental disabilities and to have Arabic as a first language. One hundred and fourteen individuals met this condition. There was a total dropout rate of 45 individuals. Six individuals could not be reached, fifteen persons declared that they did not have time and that they had no remaining problems with reading or writing and finally 13 refused to participate without giving a reason. Thirty-five adolescents continued the study. Twenty-one healthy typical readers were included in the study as a control group matching the dyslexic group as regard age. All subjects included in the study were subjected to the following:

1. Assessment of intelligence using the Weschler Scale of Intelligence.
2. The dyslexia diagnosis.

The diagnostic standard used was the so-called discrepancy criterion, in accordance with the ICD-10 and DSM-IV diagnostic manuals. According to this criterion, a significant discrepancy between intelligence on the one hand and reading and writing ability on the other, denotes specific reading and writing difficulties. In these cases a prediction of reading level had been made from the Full Scale IQ and if the reading and spelling attainment was two or more years below, compared to a group of normally achieving children, the children were regarded as dyslexic.

3. The social class of studied youth was based on the scoring system¹⁴. The social class depends upon various variables; education of the father and mother, the income month, the crowding index, the size of the family, refuse and sewage disposal, illumination and information tools. The social class was determined as follows: 55-66=high social class, 45-54=moderate social class, 35-44=low social class and <35=very low social class.
4. Interviews: Since subjects had reading difficulties, the interview was chosen as a method to obtain as much information as possible. This also made it possible to check that questions were fully understood. The interview comprised the following themes; success or failure in school, feelings of well-being in school, the impact of dyslexia on school achievements, self-esteem, peer relations and on present situation. The interview was semi-structured and some questions could be answered by choosing an alternative, which was described verbally and assigned a numerical value¹⁵.
5. Youth Self-Report Inventory (YSR): It is derived from Child Behavior Check List/4-18 (known as CBCL). It is designed for use with adolescents between the ages of 12 and 18 and the adolescent himself/herself fills out the form, whereas CBCL allows for clinicians, teachers

and parents to cross check behaviors of children. YSR contains 112 items that measure eight sub-scale symptoms: Somatic complaints, anxiety and depression, social problems, thought problems, attention problems, aggressive behavior and delinquent behaviors¹⁶. The first three subscales are referred to as ‘internalizing,’ whereas the last three are referred to as ‘externalizing’. The remaining two scales are categorized as ‘neither internalizing nor externalizing’. Overall behavioral and emotional functioning is measured by the total problem scale. An adolescent selects his / her response from 0 (not true) to 2 (very true or often true). It has been translated into Arabic and back to English to ensure congruence with the original. Several international studies support the reliability of the YSR.

6. Hamilton rating scale of depression for Assessment of severity of depression using the 16- item¹⁷.
7. Hamilton rating scale of anxiety for Assessment of severity of anxiety using the 16- item¹⁸.

Statistical analysis:

The raw data were fed to the computer program Minitab software release 13.1, copyright © 2000. Chi-Square test (χ^2) was used for comparison between two groups as regards qualitative data. Two sample t-test was used for comparison between two means of two different groups. For correlation between clinical variables Pearson correlation test was used. Results were considered significant at $p \leq 0.05$ as pathophysiological.

RESULTS

Table 1 shows no significant difference between poor and typical readers regarding age ($t=0.95$, $p=0.348$), IQ ($t=0.34$, $p=0.732$), or socio-economic status ($\chi^2=1.662$, $p=0.695$). However, males were found to be significantly higher in poor than typical reader ($\chi^2=4.978$, $p=0.026$).

Table 1: Sociodemographic data of studied groups.

	Poor Readers N=35		Typical Readers N=21		Tests of significance	
	Mean	SD	Mean	SD	t	p
Age	14.86	1.94	14.33	2.03	0.95	0.348
IQ	97.49	7.12	98.19	7.58	0.34	0.732
Gender	N	%	N	%	χ^2	p
Males	24	68.6	8	38.1	4.978	0.026*
females	11	31.4	13	61.9		
SES:	5	14.3	3	14.3	1.662	0.695
High	12	34.3	9	42.9		
Medium	10	28.6	7	33.3		
Low Very low	8	22.8	2	9.5		

*Significant at $p \leq 0.05$, IQ= Intelligence quotient.
 SES=Socio-economic status.

Table 2 shows the impact of dyslexia on self-esteem, feeling different, school achievement and peer relations of poor readers. Dyslexia had influenced their self-esteem negatively ‘quite a lot’ or ‘very much’. It was because I felt inferior to the others’ was a frequent comment to this question ($\chi^2=41.071$, $p=0.0001$). Dyslexia caused them to feel different from others ($\chi^2=28.214$, $p=0.0001$), with poor school achievement ($\chi^2=23.929$, $p=0.0001$). Dyslexia affected peer relations but this did not reach statistical significance ($\chi^2=9.139$, $p=0.058$). About 60% percent felt that their reading and writing problems had influenced their peer relations negatively ‘quite a lot’ or ‘very much’. They claimed that they had been teased or bullied because of their reading and writing difficulties. Most subjects said that thanks to having good friends, school had been tolerable in many respects. Recurrent remarks were; ‘The best moments in school were the breaks’ and ‘the only thing I enjoyed was playing with my classmates’.

Table 2: Impact of dyslexia on self-esteem, feeling different, school achievement and peer relations of poor readers.

	Self-esteem		Feeling different		School achievement		Peer relations	
	N	%	N	%	N	%	N	%
Not much at all	1	2.86	4	11.43	1	2.86	6	17.14
A little	2	5.71	1	2.86	3	8.57	5	14.29
Some	3	8.57	4	11.43	7	20.00	3	8.57
Quite a lot	10	28.57	9	25.71	8	22.86	8	22.86
Very much	19	54.29	17	48.57	16	45.71	13	37.14
χ^2	41.071		28.214		23.929		9.139	
p	0.0001*		0.0001*		0.0001*		0.058	

*Significant at $p \leq 0.05$.

Table 3 shows that the feeling of well-being had been significantly low ($\chi^2=20.357$, $p=0.0001$). Even more subjects felt uncomfortable in school. Remarks, as ‘I knew that something was wrong with me but I didn’t understand what it was then’ or ‘I felt I was the most stupid child in the class’ were common. No significant impact of dyslexia on success in school ($\chi^2=6.786$, $p=0.148$). The subjects felt they succeeded better with increasing age. In school, there were individuals with ‘good’ as with ‘bad’ achievement and the majority felt they succeeded or had succeeded. Dyslexics held a more optimistic belief in the future, they will be much better off after having left school, than they could ever have imagined. So no significant impact of dyslexia on belief in the future ($\chi^2=3.563$, $p=0.468$).

Regarding the impact of the dyslexia on their present life situation, all subjects had problems with at least spelling and slow reading. However, the interviewees felt that their difficulties did not affect them other than in reading and

writing activities any more. 'Reading takes much longer time for me, but otherwise I do not think about it'. I read much slower than my classmates, but it does not matter so much, because I understand and remember much better than most of them. So, there is no significant impact of dyslexia on current life situation ($\chi^2=8.214$, $p=0.084$).

Table 3: Impact of dyslexia on well-being in school, success in school, belief in the future and current life situation of poor readers.

	Well-being in school		Success in school		Belief in the future		Current life situation	
	N	%	N	%	N	%	N	%
Very bad	11	31.43	10	28.57	10	28.57	12	34.28
Bad	13	37.14	10	28.57	10	28.57	8	22.86
Not so good	8	22.86	7	20.00	8	22.86	7	20.00
Good	2	5.71	3	8.57	4	11.43	5	14.29
Very good	1	2.86	5	14.29	3	8.57	3	8.57
χ^2	20.357		6.786		3.563		8.214	
p	0.0001*		0.148		0.468		0.084	

Table 4 shows that the total score of YSRQ was significantly higher in poor than typical readers ($t=17.26$, $p=0.0001$). Both externalizing and internalizing scores were also significantly higher in poor than typical readers ($t=11.34$, $p=0.0001$, $t=14.35$, $p=0.0001$, respectively). The scores of withdrawal ($t=5.98$, $p=0.001$), somatic complaints ($t=7.51$, $p=0.001$), anxiety/ depression ($t=11.05$, $p=0.001$), social problems ($t=3.66$, $p=0.001$), thought problems ($t=4.89$, $p=0.001$), aggression ($t=15.67$, $p=0.0001$) and delinquent behavior ($t=11.41$, $p=0.0001$) were significantly higher in poor than typical readers. However, scores of attention did not differ significantly between the two groups ($t=0.02$, $p=0.983$).

Table 4: YSR of studied groups.

	Poor Readers N=35		Typical Readers N=21		Tests of significance	
	Mean	SD	Mean	SD	t	P
Total	26.86	5.30	9.86	1.88	17.26	0.0001*
Externalizing	13.26	3.21	6.33	1.28	11.34	0.0001*
Internalizing	13.63	3.90	3.52	1.12	14.35	0.0001*
Withdrawal	3.60	1.17	1.96	0.899	5.98	0.001*
Somatic complaints	4.31	1.30	2.19	0.814	7.51	0.001*
Anxiety/ depression	8.03	1.81	3.57	1.21	11.05	0.001*
Social problems	3.00	0.907	2.095	0.889	3.66	0.001*
Thought problems	4.20	1.32	2.62	1.07	4.89	0.001*
Attention	11.20	1.97	11.19	1.44	0.02	0.983
Aggression	11.29	2.04	4.905	0.995	15.67	0.0001*
Delinquent behaviour	5.40	1.14	2.143	0.964	11.41	0.0001*

*Significant at $p \leq 0.05$.

Table 5 shows that poor readers had significantly higher scores of depression as assessed by HRSD ($t=42.98$, $p=0.0001$) and anxiety as assessed by HRSA ($t=35.87$, $p=0.0001$).

Table 5: HRSD and HRSA of studied groups of patients.

	Poor Readers N=35		Typical Readers N=21		Tests of significance	
	Mean	SD	Mean	SD	t	P
HRSD	30.51	2.24	6.33	1.91	42.98	0.0001*
HRSA	21.26	1.92	6.14	1.24	35.87	0.0001*

*Significant at $p \leq 0.05$ HRSD= Hamilton Rating Scale of Depression, HRSA= Hamilton Rating Scale of Anxiety.

Table 6 and 7 reveals a direct positive correlation between scores of Internalizing and anxiety/depression items of YSRQ and scores of HRSD ($r=0.564$, $p=0.001$; $r=0.839$, $p=0.0001$; respectively) and HRSA ($r=0.643$, $p=0.001$; $r=0.890$, $p=0.0001$; respectively). Positive correlation was also detected between scores of HRSD and score of social item of YSRQ ($r=0.333$, $p=0.05$) and positive correlation between scores of HRSA and aggression subscale of YSRQ ($r=0.368$, $p=0.030$).

Table 6: Correlation between scores of YSR and scores of HRSD.

	Mean	r	p
Total	26.86	0.046	0.793
Externalizing	13.26	-0.148	0.378
Internalizing	13.63	0.564	0.001*
Withdrawal	3.60	0.126	0.471
Somatic complaints	4.31	0.145	0.407
Anxiety/depression	8.03	0.839	0.0001*
Social problems	3.00	0.333	0.05*
Thought problems	4.20	-0.065	0.709
Attention	11.20	-0.064	0.715
Aggression	11.29	-0.091	0.603
Delinquent behaviour	5.40	0.090	0.609

*Significant at $p \leq 0.05$.

Table 7: Correlation between scores of YSR and scores of HRSA.

	Mean	r	p
Total	26.86	0.195	0.261
Externalizing	13.26	0.123	0.234
Internalizing	13.63	0.643	0.001*
Withdrawal	3.60	-0.071	0.685
Somatic complaints	4.31	0.266	0.191
Anxiety/depression	8.03	0.890	0.0001*
Social problems	3.00	-0.168	0.284
Thought problems	4.20	0.060	0.731
Attention	11.20	0.134	0.442
Aggression	11.29	0.368	0.030*
Delinquent behaviour	5.40	0.146	0.401

*Significant at $p \leq 0.05$.

DISCUSSION

The findings of this study highlight the greater internalizing behaviors and externalizing behaviors among youth with poor reading ability relative to their peers with typical reading ability during the period of adolescence. The adolescent years present numerous challenges for young people with reading problems as they try to complete school and plan for the future. Increased rates of psychosocial difficulties and psychiatric disorders may result from such stresses. Alternatively, it could be that emerging psychosocial or psychiatric difficulties further contribute to reading problems. Not all youth with poor reading during adolescence experience problems, but these results underscore the need for identification and intervention with youth experiencing difficulties.

This study revealed no significant difference between poor and typical readers regarding age, IQ, or socio-economic status. However, males were found to be significantly more in poor than typical readers groups. Previous studies in western countries also revealed a gender difference of 3:1 and higher. Some researchers suggested the results might be biased due to the sampling method used because boys tend to catch more clinical and educational attention due to their concurrent behavioral problems^{20,21}. Until recently, findings from several large-scale epidemiological studies of RD children again supported the true difference of prevalence between boys and girls^{19,22-24}. In addition others reported that differences between poor and typical readers in terms of behavioral and emotional problems were generally not related to sociodemographic factors (age, gender, race, or SES)²⁵. The issue of possible gender differences in behavioral or emotional problems associated with poor reading at different developmental periods is important for understanding different developmental trajectories, needs and outcomes of youth. Gender differences in behavior and emotional problems may be reflective of different ways of coping or different expressions of frustration by boys and girls with poor reading at various stages of development. In a sample that was on average younger than the current sample, significant gender differences with dyslexic girls, but not boys evidencing higher rates of internalizing problems and dyslexic boys evidencing more aggressive behavior¹¹. In a longitudinal study, girls but not boys reading problems evidenced greater externalizing behaviors than youth without reading problems²⁶. Findings regarding patterns of gender differences associated with reading or learning disabilities have been inconsistent in other studies as well^{27,28}. Since our samples were derived from the clinical setting, referral bias may have somewhat contributed to the differences observed. The next question might be, whether boys and girls are truly different in terms of cognitive functions or genetic vulnerabilities of learning problems. However, several genetic studies and neuropsychological exams failed to show the differences^{29,30}.

Also the prevalence of poor reading skills in youth was highly influenced by neighborhood socioeconomic status (SES) (ranging from 3.3% in high SES to 20.5% in low SES

areas)³¹. Among the SES variables, employment of the father was a significant predictor of poor reading. The majority of children with reading disability come from low SES areas. In our sample, no significant difference was detected between poor and typical readers regarding SES because the study was performed in an area with similar SES.

Dyslexia had influenced self-esteem negatively. This was because they felt inferior to the others. Dyslexia caused them to feel different from others with poor school achievement. Most subjects said that thanks to having good friends, school had been tolerable in many respects. They remarked that the best moments in school were the breaks and the only thing they enjoyed was playing with their classmates. They claimed that they sometimes had been teased or bullied because of their reading and writing difficulties. The feeling of well-being had been significantly low. Even more subjects felt uncomfortable in school. No significant impact of dyslexia on success in school. Subjects felt they succeeded better with increasing age. In school, there were individuals with 'good' as with 'bad' achievement and the majority felt they succeeded. Dyslexic adolescents held a more optimistic belief in the future, they will be much better off after having left school there is no significant impact of dyslexia on current life situation. Ingesson¹⁵ stated that a majority of the teenagers and young adults in their study had experienced the first six years of school with feelings of being different, inferior and stupid. The uncertainty that many of them had felt, was in some cases aggravated by the attitudes of others, which resulted in poor relations and in quite a few cases, compared to children in general, teasing and bullying. A small group with bad experiences, having been bullied and uncomfortable at school, blamed their dyslexia. These young people felt that their dyslexia had negatively affected their self-esteem. On the other hand, most of the subjects did not feel that their difficulties influenced their relations and friendships; it rather seemed as if good peer relations compensated for their difficulties. Westling-Allodi³² suggests that one way to deal with difficulties at school is to 'turn on' peer relations, i.e. actively choose to invest in relationships rather than scholastic achievements. However, subjects' self-esteem suffered from their dyslexic problems and many had felt different and inferior to others. From a developmental point of view, children's self-esteem appears very vulnerable to feelings of being different. In the period between ages 7-11, children's self-esteem generally drops in comparison to self confident pre-schoolers^{33,34}. During this period children have started to evaluate themselves 'through the eyes of others and are very sensitive to being different. If then, they feel that they are less competent than others, especially in such important areas as reading and writing during the first years at school, there is a risk of a considerable drop in self-esteem. Thus, combining an age-related emotional sensitivity together with the child's bewildering feeling that something is very wrong, it is no wonder that the self-esteem is low in children who fail to learn to read and write during their first years of school. Many of the subjects felt much better and more successful in secondary school¹⁵, in contrast to Bender and Wall³⁵ survey of studies outside Scandinavia,

which demonstrated that social and emotional development may be seriously hampered with increasing age.

This study showed that the total and both externalizing and internalizing scores of YSRQ were significantly higher in poor than typical readers. The scores of withdrawal, somatic complaints, anxiety/depression, social problems, thought problems, aggression and delinquent behavior were significantly higher in poor than typical readers. However, scores of attention did not differ significantly between both groups. Youth with poor reading would report higher rates of both depression and anxiety than those with typical reading. Somatic complaints may be related to other internalizing problems such as the increased anxiety, or may be related to the stress of academic work experienced by poor readers. There was a trend for youth with poor reading to also report higher levels of delinquent behaviors and aggression relative to typical reading youth. Externalizing problems are often more easily observed by parents than internalizing symptoms because they are disruptive and intrusive to their environment. Several studies replicated the same findings; Yu et al.³⁶ reported that youth with poor reading abilities exhibited a two-fold increase in clinical behavior problems within the domains of total and externalizing behavior. Further analysis of the subscales revealed that the specific behaviors associated with dyslexia included aggressive behavior and attention problems. Dyslexic youth were four times more likely to exhibit anxious/depressed behavior and three times more likely to exhibit withdrawn behavior compared to those with no dyslexia. Karande et al.³⁷ stated that dyslexics are known to develop behavioral problems such as aggressive and withdrawn behaviors because of a lack of self-esteem and frustrations due to their poor school performance. Class retention, which had been experienced by 30% of the study children, is also known to cause severe emotional stress and lead to aggressive/ withdrawn behaviors. Arnold et al.²⁵ reported that youth with poor reading would report higher rates of both depression and anxiety than those with typical reading. No differences in anxiety and depression among poor and typical reading adolescents were described by parents, but adults are not always aware of their children's internalizing symptoms and often report fewer such symptoms than the youth themselves. Willcutt and Pennington¹¹ found no parent-reported differences in anxiety/depression for boys, but did find that girls with dyslexia were described as having more anxiety/depression than girls without reading problems. Arnold et al.²⁵ reported greater somatic complaints among youth with reading problems. Parents of youth with poor reading reported higher rates of delinquent behaviors than did parents of typical reading youth. Other studies replicated the same findings^{11,13,26} However, Miller et al.³⁸ argued these results and stated that children with dyslexia are no more likely to have internalizing problems than children with normal reading achievement. Furthermore, the children with the most severe reading impairments in this sample also have means scores for behaviors associated with anxiety, depression and somatic complaints well within the average range. No children, with or without severe reading deficits, were identified by both parent and teacher as having significant internalizing symptoms and only one child

reported elevated anxiety symptoms. They explained their results by the using assessment battery for their study that was somewhat different than that of other published studies, particularly in measuring internalizing symptoms. This study also differed from other studies in the diagnostic criteria used to identify children with dyslexia. Other studies have used a cut score system wherein children scoring below a particular percentile or standard score are identified as dyslexic. For this study, two different, diagnostic models were used. This large difference made it more likely that the most impaired readers were identified and reduced the likelihood of over-identifying children with dyslexia. Knivsberg and Andreassen³⁹ obtained information on behaviour/emotions from parents, teachers and participants by means of the Child Behavior Checklist, Teacher's Report Form and Youth Self Report. The dyslexia group showed significantly more problems in all areas than the controls. This was reported from all three groups of informants. Parents reported most problems, internalizing behaviour for more than 50% of the participants and total problem behaviour for nearly 45%.

Poor readers had significantly higher scores of depression as assessed by HRSD and anxiety as assessed by HRSA. There was a direct positive correlation between scores of internalizing and anxiety/depression items of youth self report questionnaire and scores of HRSD and HRSA. As expected, scores on the HRSD and HRSA were strongly correlated with the internalizing dimension on YSR. The YSR syndrome scale 'Anxious/Depressed' was also strongly correlated with the HRSD and HRSA indicating that the two scales measure roughly similar dimensions. Thus, both the more global Internalizing dimension of the YSR and the 'Anxious/Depressed' syndrome scale, have convergent validity with the HRSD and HRSA. Generally, the HRSD and HRSA correlations with the YSR subscales included in the Internalizing dimension were stronger than correlations with those included in the Externalizing dimension. We infer that the YSR Internalizing dimension and its Anxious/Depressed subscale can be considered a fair measure of depressive symptoms in young adolescents. Internalising dimension ('Social problems' and 'Anxious/Depressed') and syndrome scales part of the Externalizing dimension ('aggression') were associated with depression is in consonance with other studies suggesting that disruptive and other externalizing behaviour problems and depressive or anxious internalizing symptoms often coexist⁴⁰. This results support the long-held notion that people are either acting in (i. e. sad/depressed or anxious) or acting out (i. e. troublemakers) when they are sad/depressed. Goldston et al.⁹ found that anxiety disorders were three times more prevalent; in particular, social phobia and GAD were both five times more prevalent among poor readers than among typical readers. Other studies replicated the same findings^{13,41}. Apprehension about speaking or reading in public because of fears of criticism from peers or teachers. Many of the adolescents with social phobia had skipped classes or accepted lower grades rather than talk in front of the class or make presentations and they experienced social anxiety in other situations⁴². The rates of affective disorders (primarily major depression) were 80% higher among adolescents with poor reading skills relative to those

without reading difficulties. In addition, greater functional impairment was observed in the area of mood and self-harm among the adolescents who had difficulties with reading⁹. Higher rates of suicidal ideation and attempts was detected among adolescents with poor reading skills, which in turn are related to higher rates of dropping out of secondary school⁴³. Also, rates of conduct and oppositional defiant disorders did not reliably differ between the reading groups⁹. There were increasing rates of substance use disorders as the adolescents approached young adulthood. Ackerman⁴⁴ tied reading problems to emotional distress in school and supported conclusions about the direction of effects and the internalization of academic difficulty for disadvantaged children. In addition, dyslexic students in higher education show anxiety levels that are well above what is shown by students without learning difficulties⁴⁵. This anxiety is not limited to academic tasks but extends through many social situations.

CONCLUSION

Indeed, dyslexia had influenced adolescents' self-esteem negatively, caused them to feel different from others with poor school achievement and lower feeling of well-being in our study. Dyslexic adolescents in this study also suffered from externalizing and internalizing symptoms withdrawal, somatic complaints, anxiety/depression, social problems, thought problems, aggression and delinquent behavior that were significantly higher in poor than typical readers. They showed significantly higher scores of depression as assessed by HRSD and anxiety as assessed by HRSA. We infer that the YSR Internalizing dimension and its Anxious/Depressed subscale can be considered a fair measure of depressive symptoms in young adolescents.

We believe that the results of the present study will help generate awareness about youth with dyslexia and result in their early identification and initiation of appropriate psychoeducational interventions, namely, remedial education for dyslexia and behavioral and medical management for associated emotional and behavioral symptoms. These interventions will help these adolescents achieve school grades at a level that is suitable for their intelligence. This would help prevent not only poor school performance, class retention and development of behavioral problems but would also help them develop into well-adjusted adults. Dyslexia frequently persists into adulthood and long-term consequences of their remaining undetected include an increased risk for developing substance abuse addiction and psychiatric disorders such as anxiety disorder, depression, oppositional defiant disorder or conduct disorder³⁷.

RECOMMENDATIONS

This study underscores the need for identification of youth experiencing dyslexia and intervention to help them overcome this difficult developmental transition period. The interrelationship between poor reading and

emotional and behavioral difficulties found in this study also underscores the possibility that among youth who present with psychiatric problems, clinicians should be alert to the possibility of dyslexia. Reading assessments for adolescents struggling in school may help identify not only youths in need of more individualized or intensive reading instruction but also youths at risk for multiple psychiatric and psychosocial problems. Early diagnosis of dyslexia is important because interventions have been shown to be more effective with younger children. Moreover, preventing, or at least alleviating the secondary effects of dyslexia. Students with dyslexia should be encouraged in areas such as sports, social activities or a special interest where they can do well and makes them view themselves positively. Schools should also offer alternative educational programs suited to each student's aptitude, in order to give the dyslexic students a chance to feel successful in school and in subsequent employments. Effective reading remediation programs, psychosocial interventions for youths with reading problems, or prevention programs focused on assisting these youths as they navigate their last years in secondary school or helping them at younger ages to better prepare for the secondary school years and beyond may yield improved outcomes.

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Corresponding Author:

Mai Eissa
Assistant Professor Neuropsychiatry, Department of
Neuropsychiatry, Tanta Faculty of Medicine, Egypt
E-mail: maieissa@hotmail.com