




The Impact of Parents' Emotional Expression on Their Children with Specific Learning Disorders: The Role of Parental Educational Counseling Program

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Abstract

Edited by: Branislav Filipović
Citation: Al-Safory O, Hussein HA, Mowafy MAR, Sarhan MD. The Impact of Parents' Emotional Expression on Their Children with Specific Learning Disorders: The Role of Parental Educational Counseling Program. Open-Access Maced J Med Sci. 2022 Mar 20; 10(B):1706-1714. https://doi.org/10.3889/oamjms.2022.8664

Keywords: Specific learning disorders; Emotional expression; Anxiety disorder; Serum cortisol level; Egypt
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Received: 17-Jan-2022

Revised: 07-Mar-2022

Accepted: 10-Mar-2022

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Funding: This research did not receive any financial support

Competing Interest: The authors have declared that no competing interest exists

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BACKGROUND: According to the diagnostic and statistical manual of mental disorders, the fifth edition (DSM-5), specific learning disorders (SLDs) are neurodevelopmental disorders that share common features of persistent difficulty in learning key academic skills such as reading, writing, or mathematics. Some children in different countries worldwide suffer from various forms of SLDs, which can be highly frustrating for a schoolchild, especially if associated with high (negative) parents' emotional expression (PEE).

AIM: This study aimed to identify the relation between PEE and anxiety in children with SLD, and evaluate the effect of a parental educational counseling program (PECP) on the emotional expressions (EE) of parents and anxiety in children with SLD.

METHODS: A randomized controlled trial was conducted on 140 children with SLD and their parents at the Helwan University Educational Hospital's learning disability unit in Cairo, Egypt. The emotional expression scale (EES) of parents and Taylor manifest anxiety scale (TMAS) of children were used, and children's serum cortisol levels were measured as an anxiety marker. TMAS and EES were repeated after the conduction of 10 sessions of PECP. Serum cortisol samples were taken before PECP.

RESULTS: The study was revealed that more than half (60%) of studied children are suffered from morbid anxiety, and 80% of their parents practised high EE. Cortisol levels were significantly higher in children with severe and morbid anxiety, and in children whose parents practised high EE ($p < 0.001$). After applying PECP, scores of TMAS demonstrated a significant drop from 33.06 ± 10.4 to 25.85 ± 10.4 , and scores of EES showed a significant drop from 61.31 ± 16.84 to 36.51 ± 13.89 .

CONCLUSIONS: There was a statistically significant positive correlation between scores of TMAS& EES before and after PECP ($r = 0.533$) and ($r = 0.309$), respectively, proving the presence of a direct impact of PEE on the anxiety of studied children with SLDs.

Introduction

Specific learning disorders (SLDs) are a group of neuropsychological disorders which reduce a child's ability to read and/or write and/or use numbers. The DSM-5 considers SLD as a persistent difficulty in learning skills among the average or above level of intellectuality [1]. It is not due to intellectual, visual, auditory disabilities, attention deficit, other mental or neurological disorders, psychosocial adversity, or inadequate education [2]. SLDs can be highly frustrating for students, especially if associated with high parents' emotional expression (PEE) and can affect the self-esteem and motivations of schoolchildren. Many students with SLDs struggle for a long time in school before being diagnosed [3].

According to DSM-5, studies reported 15–20% of schoolchildren have SLDs; 4–9% for deficits in reading (Dyslexia), 3–7% for deficiencies in mathematics

(Dyscalculia) [4]. The prevalence of severe stress in SLDs children is 16.6%, severe depression is 14.2%, and severe anxiety is 23.8% [3]. Data from public schools in the USA were showed an estimated SLDs prevalence of 5% among school-age children, with 2.4 million students found to have SLDs. On analyzing the prevalence of SLD in schoolchildren in the USA from 2008 to 2012, the findings of their studies showed that 7.66% of children had SLDs [5]. Epidemiological studies estimated SLDs prevalence of 15–20% for difficulties in reading among Egyptian school children [6], [7]. According to DSM-5, the criteria of generalized anxiety disorder in children are anxiety and worry associated with one or more of the following six symptoms most of the time for 6 months; restlessness, being easily fatigued, difficulty concentrating, irritability, muscle tension, and sleep disturbance [8], [9].

A study performed in India, which was conducted on children with SLD aged 8–15 years, was recruited from a learning disability clinic in Mumbai. The

matched controls were recruited from four schools in Mumbai, Maharashtra, to determine if school students with SLDs were more likely to have anxiety than their regular peers. "It was revealed that students with SLD clinically anxious relative to their peers" [10].

This result was after a study performed in Canada, which was conducted on about 80 SLD patients, to assess the levels of anxiety and stress among children and adolescents having SLD, and (40%) severe stress and severe anxiety were seen in this sample [3]. Those conclusions were similar to the conclusion of a study performed on 52 children with SLDs aged from 8 to 13 years to assess the development of anxiety in them, and it revealed patients more often had a clinically significant level of anxiety [11].

A study was conducted in Cairo-Egypt, on a sample of 120 children of elementary school students with SLD, and their parents to assess the effect of a familial counseling program on the effective parenting and the psychological disorders of their children, and to evaluate the impact of high PEE on the anxiety of SLD patients, which was classified into mild, moderate, severe and morbid anxiety. "It was revealed that both severe and morbid anxiety were higher among children with high PEE" [12]. This conclusion was like the conclusion of a study carried out in Egypt, which was conducted on 100 schoolchildren with SLD and their caregivers in the primary stage of education in the department of mental health and psychological counseling of the Faculty of Education, Ain Shams University, to assess the relation between anxiety disorder of patients and familial EE [13].

Although several studies were conducted on SLD schoolchildren, we still need more research to expand our knowledge and experience concerning SLDs. Therefore, we conducted our research on anxiety disorders among a group of schoolchildren with SLDs in Egypt to know the relation between the high EE of parents and anxiety among their children with SLDs. This study is the first in Egypt and the Middle East to address SLD, PEE, cortisol level, and a health education program.

Materials and Methods

Study design

Experimental quantitative research using a randomized controlled trial was applied in this study.

Subjects and population

This study was carried on 140 children with SLDs in the age group from 10 to 14 years old, who attended the learning disability unit (LDU) and whose parents agreed to participate. Two psychiatric consultants diagnosed the studied children with SLDs

according to specific criteria for SLDs in DSM-5, and using the Battery for diagnostic assessing standards of developmental and academic learning disabilities. They were of average or above-average IQ (>85) using the Stanford intelligence scale. Their caregivers were included (all of them were parents).

All children were recorded in Arabic governmental, national schools. Children with comorbid disorders such as attention deficit hyperactivity disease, intellectual disabilities, or nocturnal enuresis were excluded. Those with a history of sensory impairment (visual or hearing defect), history of head injury, neurological disorder, or those who have an insufficient learning environment were also excluded from the study.

Study time

The study was conducted between June 2019 and the end of March 2020.

Study setting

The study was performed in LDU in the child psychiatry outpatient clinic of the Educational Hospital of Helwan University, Cairo, Egypt. Sessions of parental educational counselling program (PECP) were conducted at the lecture hall of the hospital, and cortisol samples were taken in the hospital lab.

Sample size

The child psychiatry outpatient clinic received around 30 children and adolescents per week with an equal of 120 per month; 10% of them were referred to LDU, equal to 12 SLD cases per month, and 144 children and adolescents per year. The sample size was 140 children with SLD.

- The data were collected using the following tools:

All children were subjected to the following

Personal history data

It was attached to the informed consent to collect the socio-demographic data of children and their parents.

Stanford Binet Intelligence Scale-Fifth Edition

This scale includes five factors of cognitive ability; fluid reasoning, knowledge, quantitative reasoning, visual-spatial processing, and working memory. Both verbal and nonverbal responses were measured. Each of the five factors was often reduced to a ratio known as the IQ [14].

Battery for diagnostic assessment standards of developmental and academic learning disabilities

It consists of developmental learning standards (Attention, memory, auditory perception, visual perception, and motor perception), academic learning standards (Reading, writing, and math), emotional difficulties, and social behavior scale [15].

Taylor manifest anxiety scale (TMAS)

It consists of 50 true or false items to assess anxiety levels. The total score is obtained by summing the answers of 50 questions about anxiety symptoms. Scores were from 0 to 16 (free), 17–20 (mild), 21–26 (moderate), 27–29 (severe), and 30–50 (morbid anxiety) [16]. The test is taken and interpreted as an explicit measure of anxiety, which was translated into Arabic by Fahmi *et al.* [17]. They also conducted the necessary studies on the test so that they were assured of its reliability. Construct validity has been studied on children in the Egyptian environment from the age of 10 to 15 years. Since that time, it has been considered a validated specific tool to assess the anxiety of children in psychiatric outpatients clinics in Egypt.

Serum cortisol level measurement

About 5 ml of venous blood was collected. The morning sample was used for measurement as a biological marker for stress [18]. This test was applied, collected, and analyzed by the hospital lab staff. The normal range in this age is 3–21 mcg/dl [19].

All parents were subjected to the following

Emotional expression scale (EES)

It includes 48 items; divided into four subscales of questions; 7 items for emotional over-involvement (EOI), 13 for family warmth and positive remarks, 19 for criticism and hostility, and 9 items for negative perception. The answers never happened, sometimes, and always. The scores were designed to be zero for never happen, 1 for sometimes, and 2 for always. Total scores of positive responses in each domain reaching >50% were considered (high) EE, and those with scores < 50% were considered (low) EE. EES was modified based on (level of expressed emotion scale) [20] and on (the family attitude scale) [21]. EES has been used in many Egyptian studies before [22], [23].

PECP

Family counseling is crucial for children's psychological, social, educational, professional, and

emotional aspects. Sessions of this program aimed to improve children's anxiety with SLDs by correcting parents' ways of dealing with their children's disorders. PECP was designed after reviewing studies about the same issue. Their results revealed effective development in psychological disorders of children with learning difficulties after conducting health education for parents and caregivers [12], [13]. The program often consisted of sessions over 10 months. The duration of each was 1–1:30 h. The program was delivered in Arabic using simple ways. It included logic, realistic, and simulating situations to suit the audiences' educational, cultural, and socioeconomic levels.

Illustrative tools, flyers, and diagrams were added to make the program more informative and competent for the expected results. Different strategies such as interactive lectures, videos, role-plays, assignments, and summarization covered all learning styles; visual, auditory, reading and writing, and even kinesthetic. Handouts have been distributed, besides using whiteboards and markers to clarify some points. Interactive lectures, slides of PowerPoint material, assignments, and constructive feedback were used to conduct sessions. Role-playing was used in sessions of effective parenting, behavioral modification, and anger management.

The sessions and their specific objectives were as follow

Opening session

To establish rapport with parents, obtain informed written consent, complete forms of EES questionnaire, introduce the program (definition, objectives, benefits, procedures, and system of sessions), and create parents' motivations toward commitment and participation in the program.

Learning disorders and families

To assist parents to be aware of types, signs, causes, and concepts of SLD. The session illustrated the proper way to deal, manage, and insight the parents about the importance of their effective role in providing a healthy environment for their children's mental health.

Continue (Learning disorders and families)

To acquire some skills for positive perception, interaction, and proper responses, and to construct parents' cognition to promote children's self-confidence, abilities, and skills by encouraging their talents.

Signs of anxiety in children with SLD

To enlighten parents about manifestations of children's anxiety and illustrate some essential tips and studying techniques to overcome it.

Parents' emotional expressions (PEE)

Types of high (negative) EE (criticism, hostility, negative perception, and EOI) and Low (positive) EE (family warmth and positive remarks) were discussed. The direct relationship between the EE of the parent toward the child with SLD and the level of anxiety was explained, as was how to control high EE.

Behavior, behavioral modification, and positive reinforcement

To define the behavior and how to note and record. The strategies of behavioral modification were suggested. Besides, the concept of positive reinforcement and how to apply the praise were discussed.

Temporary isolation and anger management

Temporary isolation as a useful way to punish was suggested. To identify the negative effects of physical and verbal punishment and to enlighten parents about the meaning of anger and some strategies for management.

Communication skills and problem-solving

To provide awareness about effective communication and its role in achieving effective parenting. Assist the audience in acquiring skills to manage time, organize opportunities, make decisions, solve problems, and find alternatives.

Effective parenting ([role model] and [acceptance and unconditional love])

To realize that they are the powerful source of learning, emotional support, an element of developing the personality of their children, and the role model to imitate. Clarify the concept of effective parenting, acceptance, and its effect on the behavior. Stimulate parents to build strong bonds with children through unconditional love.

Closing session

For revision, summarization, feedback, assessment, and complete the post-questionnaires of EES and TMAS.

Validity and reliability

Tools were tested and evaluated for their face and content validity and reliability. Face and content validity were tested by five professors in two different specialties: Mental health nursing and community

health nursing. To ascertain relevance, clarity, and completeness of the tools, professors elicited responses, which were either agree or disagree, for the face validity and content reliability. Items on which 85% or more of the professors have agreed were included in the proposed tool. Required corrections and modifications were performed. The tools' reliability was assessed by measuring their internal consistency using the Cronbach alpha coefficient test. It was proved to be high. Cronbach alpha coefficient test results for the tools' reliability as follow: (Reliability: 6.34), (Face validity: 98.2), and (Statistical validity: 6.24).

Statistical analysis

The collected data were tabulated and analyzed using the statistical package for social science, version 25. Categorical data were expressed as numbers and percentages using "chi-square," Fisher's exact test, or "Z" test for analyzing them. Continuous variables were presented as mean and standard deviation using the "Student t" test or ANOVA for analyzing them. This work's accepted significance level was 0.05 ($p < 0.05$ will be considered significant).

Ethical consideration

Informed and written consent was obtained from the parents before participation. It included data about the benefits of the study, the aim of the work, site, time, subject, tools, confidentiality, and the possibility of withdrawal from the study at any time without any consequences. Approval from the research ethics committee and institutional review board was obtained.

Results

Socio-demographic data showed that more than half of patients were boys (59%), the mean age \pm SD of boys and girls was 10.95 ± 1.246 and 10.93 ± 1.168 , respectively. Around 40% of them were of middle sibling order and in the sixth educational level of the primary stage. The majority of attendants (90%) were mothers. All of them were housewives; 99% of them just could read and write, while 1% were illiterate. Regarding fathers, 60% of them worked in professional jobs (without fixed income). The majority of parents (87%) showed negative consanguinity. The results of TMAS showed that 60% of children were suffering from morbid anxiety before PECP. This percentage decreased to 40% after the conduction of PECP sessions. The percentage of children free from anxiety increased from 10% to >20% after PECP. Scores of TMAS revealed a significant drop from 33.06 ± 10.4 to 25.85 ± 10.4 after PECP with a mean change of 7.207 ± 6.642 ($p < 0.001$).

Results of EES showed that 80% of parents were practicing high EE before PECP, which decreased to 8.6% after PECP. Those who were practicing low EE increased from 20% to 91.4% after receiving sessions of PECP. More than two-thirds of parents (71.4%) became practicing low EE, and scores of EES revealed a significant drop from 61.31 ± 16.84 to 36.51 ± 13.89 after PECP with a mean change of 24.793 ± 22.657 ($p < 0.001$). A statistically significant positive correlation between scores of TMAS and EES before PECP intervention was found to be ($r = 0.533$) (Figure 1).

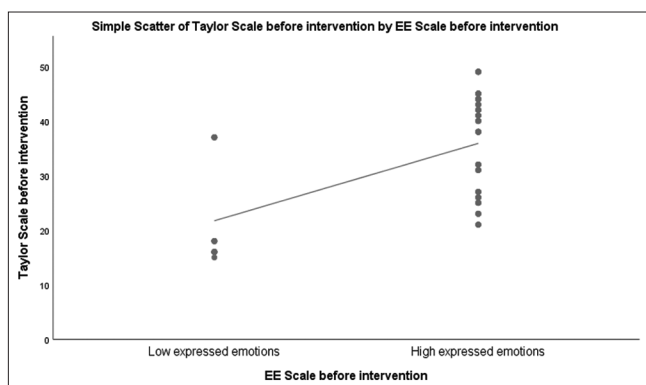


Figure 1: Relation between scores of TMAS and EES before PECP

Moreover, a statistically significant positive correlation between scores of TMAS and EES after PECP intervention was found to be ($r = 0.309$) (Figure 2).

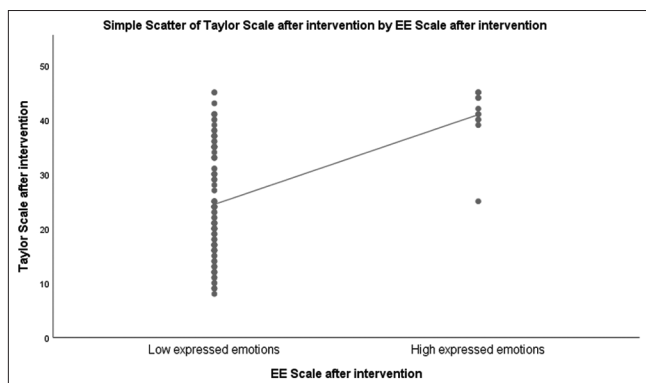


Figure 2: Relation between scores of TMAS and EES after PECP

The mean \pm SD of serum cortisol level of children with SLDs was 8.973 ± 1.784 mcg/dl, and it was significantly higher in boys than girls ($p < 0.05$).

The average cortisol level was significantly higher in boys than in girls; the mean \pm SD of boys was 9.246 ± 1.653 mcg/dl and of girls was 8.586 ± 1.903 mcg/dl. The serum cortisol level was significantly higher in children whose parents have high EE ($p < 0.001$), and in children with morbid and severe anxiety (9.89 ± 1.038 and 8.75 ± 0.935 , respectively).

The scores of EES before PECP intervention revealed a statistically positive correlation with serum cortisol levels of children ($r = 0.468$) (Figure 3).

The scores of TMAS before PECP intervention demonstrated a statistically positive correlation with serum cortisol level ($r = 0.771$) (Figure 4).

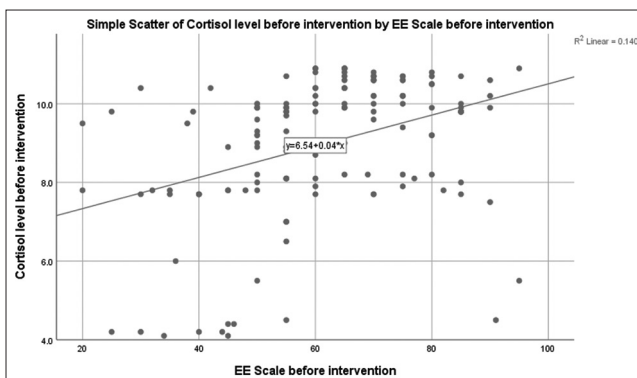


Figure 3: Relation between serum cortisol level of children and scores of EES before PECP

Discussion

This present study aimed to recognize the impact of PEE on schoolchildren with SLD and focused on teaching caregivers how to understand the concept of SLD and how to deal with their children's disorders. We hypothesized that the serum cortisol level of studied children with high PEE would be higher than in children with low PEE, and that scores of TMAS and EES would decrease after PECP. As we hypothesized, the study proved the presence of the direct effect of high PEE on children's anxiety and revealed the effectiveness of PECP.

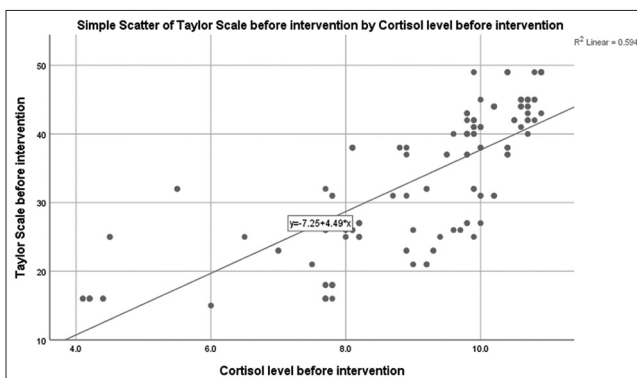


Figure 4: Relation between serum cortisol level and scores of TMAS before PECP

Discussion

Socio-demographic characteristics of studied children showed that boys were more than girls, which may refer to the prevalence of SLDs in males more than females in a ratio ranging from (2:1–3:1) according to the Department of Education and National Center for Education Statistics (2019) [24]. It may reflect the higher educational care of parents toward sons more than daughters, as a side effect of gender discrimination in the Middle East.

Socio-demographic results of studied parents revealed that participating mothers outnumbered fathers; this reflects the nature of Egyptian culture. Females are responsible for providing full-time care to family members suffering from mental disabilities, psychiatric disorders, or even physical illness. It may also be because they were housewives and many fathers worked in morning jobs (when the sessions were conducted).

More than half of fathers were working in professional occupations (with low, no fixed income), which refers to the high prevalence of SLDs among families with low socioeconomic status. This follows the Department of Education and National Center for Education Statistics (2019) [24].

Regarding academic grades, the number of children in 5th and 6th grades is larger than those in 7th and 8th; this refers to the early appearance of SLD, which affects scholar performance directly and passing to the next grades according to the American Psychiatric Association (2013) [25].

The average cortisol level was significantly higher in boys than girls; fear of parents from escaping their sons out of the educational process may cause extra pressure on males. The EE of more than two-third of parents improved after conducting sessions of PECP; their scores demonstrated a significant drop, which supports the effectiveness of PECP, but the rest of them were still manipulating high EE, most probably due to incomplete commitment toward sessions.

The effectiveness of PECP, despite the low socioeconomic condition and high illiteracy of the audience, suggests that the used tools and methods were appropriate for their educational level. Conduction of sessions in group education helped the participants share their experiences, acquire problem-solving skills, enhance their ways of thinking, and let most of them feel less guilty about the disorder of their children.

Giving constructive feedback between researcher and audience assisted in the early detection of hostility and domestic violence. One of the mothers told the researcher at the closing session that she used to hit her daughter while studying and doing homework, but now she promotes self-confidence of her child by encouraging other talents, activities, and applying our strategies for studying and effective parenting.

Other studies

Socio-demographic characteristics of this study were similar to those of a cross-sectional study was conducted on 218 schoolchildren with ages ranging from 6 to 12 years old, of both sexes, in (Al Nahda Al Haditha Primary School), Damanhour, Behira, Egypt, to assess the prevalence and socio-demographic risk factors of learning disorders in school students studying in a governmental school.

Exclusion criteria were students with hearing and visual problems, handicapped, and students with neurological disorders and chronic medical conditions. They were with average intellectual abilities. Learning disorders in that study were common in primary school students and were more likely to be from low socioeconomic status. Socioeconomic status in students can affect the learning process severely, particularly when parents are unemployed or illiterate, and consequently struggle to support the learning of their children. This may explain those results regarding socioeconomic status, which were children with very low socioeconomic status had higher learning disorders (mean: 5.650 ± 1.73), with statistically significant difference ($p < 0.05$) [26].

Socio-demographic characteristics of the present study were almost similar to those of a study performed in India, which involved 60 children (boys and girls) with SLDs. Their ages were close to our age group of (10–15) years. The study was conducted in the child department at the National Institute of Mental Health and Neurosciences, Bangalore, to explore parental attitudes toward children with SLD. Parents' attitude was assessed using the parental attitude scale. In the present study, after receiving PECP sessions, scores of EES were demonstrated a significant drop. This improvement is in accordance with the previous study of Bangalore, India, which highlighted the need to educate parents to lower their expectations for children with SLD and strengthen the social support network of these children's families [27].

The percentage of parents who were practicing high EE decreased significantly, and the percentage of parents who were practicing low EE increased significantly too, after receiving the sessions of PECP. This improvement is in accordance with a study aimed to investigate whether training parents with high EE could improve outcomes of 52 children and adolescents with social anxiety whose parents exhibited high levels of EE. That study assessed the level of stress and anxiety among them using anxiety and stress scales. It also determined the awareness among their parents after receiving parent training sessions. "It was revealed that most parents became better at practicing low EE" [28].

The scores of TMAS in the present study decreased significantly after PECP. This improvement was like a study performed in Canada on 82 SLD patients to evaluate parental awareness about their child's learning disorder after parents completed the parental interview program. "It highlighted the importance of training interventions for parental awareness of the emotional consequences of SLD and for children focusing on strengthening their coping" [3].

These conclusions are in accordance with a study which was conducted in Egypt on a sample of families having SLD patients and revealed a drop in psychiatric disorders of them after their caregivers attended multiple sessions of the educational psychosocial program [12].

Strength points

From the strength points of this current study, it provides important information about how the parents can adopt the learning practices. This information can be useful in the management of unhealthy practices and violence.

Cortisol hormone is considered an anxiety marker and an indicator for exposure to stressors [29]. It has been observed to interact in the dysfunctional hypothalamic-pituitary-adrenocortical axis, especially on the level of the amygdala and hippocampus [18]. Our study is the strongest of its kind in SLD studies in Egypt because it is the only one that has combined SLD, PEE, cortisol level, and a health education program.

Many types of research conducted on counseling families and increasing their awareness revealed that health educational counseling programs play an important role in caregiver burden and quality of life of patients [30], [31]. The effect of PECP on children's anxiety was studied to improve the way of dealing with schoolchildren who have SLDs. This study provides an effective counseling program for the family that is easy to use and implement. We need this kind of awareness in our country, so we recommend applying sessions of PECP on a broad national scale at other LDUs in Egypt.

Limitations and recommendations

Some limitations of this study are the difficult handling of children during the taking of cortisol samples, difficult communication with illiterate mothers, which made the study and filing of the structured interview questionnaires more time-consuming, and difficulties in scheduling the sessions to suit the circumstances of all parents.

The average age of boys and girls was too close and the majority of parents were of negative consanguinity; most probably due to the narrow-randomized sample and the narrow range of age of the selected sample. Hence, we recommend that the next paper will select broader, wider range, and non-randomized samples. Only 41% of children improved after PECP; this may be due to struggles between parents, which can increase stress and worsen anxiety. Hence, we recommend doing more studies on SLDs concerning other familial conflicts.

In the morning, the normal range of cortisol in children was 3–21 mcg/dl [17], [32]. The average serum cortisol value of children of the current study was 8.973 ± 1.7847 mcg/dl. In another study performed in the USA to assess children's anxiety by measuring salivary cortisol levels, the average was 0.107 ± 0.551 mcg/dl [29]. The normal range of salivary cortisol is 0.28 ± 0.03 mcg/dl [33]. The way of taking the samples may explain this difference; the serum method stresses the children more than the salivary

one because it is more invasive and painful. Hence, we recommend that future studies on children's anxiety with SLD measure salivary cortisol.

Average cortisol levels were significantly higher in SLD schoolchildren with morbid and severe anxiety, and in children whose parents have high EE. While in a study conducted on salivary cortisol in a total of 157 children of both sexes, aged between 6 and 12 years old, distributed into four groups: 43 of them were with SLD, 90 with attention-deficit hyperactivity disorder and autism spectrum disorder, compared to 24 typically developing children, the mean percentage change for salivary cortisol did not differ between the groups [34].

These differences may be explained by the presence of different factors that affect children with SLDs, like other recent stressing factors that put extra pressure on children that were not excluded or assessed in this study (e.g., new sources of anxiety such as separation anxiety or bullying by colleges).

The present study results showed a statistically significant positive correlation between scores of TMAS and EES before and after PECP. Serum cortisol levels were significantly higher in children with high PEE. These results revealed the presence of a strong relation at home between PEE and the anxiety of children with SLDs. Despite the current study's significance, it missed focusing on the effect of high EE of teachers and colleagues in the school, so we recommend that the future paper assess the impact of EE of teachers and colleges on the students with SLD.

We applied everything possible according to our resources, but the number of recent studies on SLDs was few, so the conduction of more studies on that critical topic about the anxiety of children with SLD is recommended for importance.

Conclusions

This study highlights that high PEE increases anxiety in children with SLD. PECP effectively reduces the high EE of parents and the anxiety of their children. These findings need to be considered in developing comprehensive care of children with SLD to help caregivers deal with their disordered children.

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