

The Effect of Self-Regulation Strategy Training on Reducing the Symptoms of ADHD among Cycle One Students in Oman

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Abstract

Teachers and parents face many challenges that hinder the flow of the educational process at school. One of these challenges is how to deal with attention deficit and hyperactivity disorder (ADHD) students and how to increase their attention and decrease their ADHD symptoms while studying or even in their own life. Similarly, parents find it difficult to deal with these students and keep them calm and focused. In Oman, there is a dearth of research on how to treat ADHD students using educational and psychological solutions. Most of the treatments are previously done clinically and with the help of therapists at hospitals. This pilot study was conducted to assess the effect of suggested strategies which are argued to reduce hyperactivity disorders and increase attention for ADHD students. This strategy is called self-regulation strategy training, and it is claimed that a deficit of self-regulation is essentially pertinent to increase ADHD symptoms (Barkley, 1997). The pilot study fundamentally focused on training six ADHD students, identified by the Teachers and Parents' Conners' scales, to self-regulate their behaviours and thoughts using planning, monitoring and evaluation activities as suggested by Zimmerman (2000) for eight weeks. The finding of this study provides promising results for future projects. In this pilot study, teachers and parents hold positive perceptions towards the intervention through the qualitative data, and the Teachers and Parents' Conners' scales provided a noticeable decrease in the symptoms of ADHD. However, more studies are encouraged to provide more valid and reliable results..

Keywords: Conner's scales, attention deficit and hyperactivity disorder (ADHD), self-regulation strategy, self-regulation strategy training (SRST), school in Oman

1. Introduction

Teachers and parents face many challenges that hinder the flow of educational processes at schools. One of these challenges is how to deal with attention deficit and hyperactivity disorder (ADHD) students and how to increase their attention and decrease their ADHD symptoms while studying or even in their own life. Similarly, parents find it difficult to deal with these students and keep them calm and focused. In Oman, there is a dearth of research of how to treat ADHD students using educational and psychological solutions (Al-Balushi et al., 2019). Most studies that have been conducted previously are descriptive and researchers do not manipulate specific interventions to reduce ADHD students' symptoms (e.g., Al-Balushi et al., 2019; Marwan Al-Sharbati, Al-Sharbati, Al-Lawatiya, & Al-Jahwari, 2012; MM Al-

Sharbati, Zaidan, Dorvlo, & Al-Adawi, 2011). Besides, the existing studies in Oman provide treatments that were administered clinically or with the help of therapists at hospitals (M. M. Al-Sharbati et al., 2016).

However, for this project, a pilot study has been conducted to assess the effect of a suggested program which is argued to reduce hyperactivity disorders and increase attention for ADHD students. This programme is called self-regulation strategy training (SRST) and it is claimed that a deficit of a self-regulation is essentially pertinent to increase ADHD symptoms (Barkley, 1997). The pilot study fundamentally focused on training six ADHD students, identifies by the Teachers' and Parents' Conners' scales, to self-regulate their behaviours and thoughts using planning, monitoring and evaluation activities as suggested by Zimmerman (2000) for eight weeks. Zimmerman (2000) proposed three stages to implement self-regulation strategy. First, the learners set a goal for their learning so that they can have a clear idea for what to do. Second, learners monitor their progress to discover any drawbacks they have missed. Third, learners evaluate their learners and check if they have achieved what they have previously planned. After the stages of self-regulation have been applied, the finding of this pilot study would provide promising results for future projects. In this pilot study, teachers and parents would be asked about their perceptions of the intervention through the qualitative data. Moreover, the Teachers' and Parents' Conner's scales would offer data that can assist in identifying symptoms of ADHD before and after the intervention. However, in future projects, the population and the sample of the research will be larger to obtain valid and reliable results.

2.Literature review

Over the past decade, most research in ADHD has focused on identifying the symptoms of ADHD for children and adults. Few studies have attempted to intervene in ADHD students to help them and assist their parents and teachers to solve students' problems. One of these studies was conducted by Tamm, Nakonezny, and Hughes (2014) in which the researchers used intervention for 24 kindergarten children to second-grade students employing metacognitive executive function training. After eight weeks of the treatment, parents were highly attentive and satisfied with low attrition. In addition, visual/auditory attention, working memory and cognitive flexibility showed significant improvement according to parents' ratings. Furthermore, the symptoms of inattention reduced noticeably. However, the study depends largely on parents' rating and ignored teachers' rating and opinions about the children's behaviours. Moreover, the study did not include grade four schoolchildren and the sample was just young children at kindergartens to grade two. Another study by Hannesdottir, Ingvarsdottir, and Bjornsson (2014) investigated an effect of a program called OutSMARTers on social skills, self-regulation and executive functions of ADHD students compared to a control group. The sample was 41 ADHD students aged between 8 -10 years old. The study revealed that the symptoms of ADHD decreased, and the social skills and emotional regulation improved after the treatment. In the above-mentioned research, the self-regulation strategies were a dependent variable whereas in the current project self-regulation strategies training is an independent variable and it will be manipulated to examine its effect on ADHD students. As mentioned earlier, in the Omani context few studies have exposed to ADHD problem and these studies were just descriptive or correlational. For example, MM Al-Sharbati et al. (2011) conducted a descriptive study to identify the chrematistics of ADHD Omani students using the Diagnostic and Statistical Manual (DSM) for Mental disorders criteria. The findings of the study revealed that male students were significantly more than female students in the Omani context. Besides, consanguinity and brain injury were the main causes of ADHD problem among the participants and most of them were attending regular

schooling. Another study was conducted by Al-Ghannami et al. (2018) and this study was correlational. It aimed to explore the prevalence of ADHD in government schools and to investigate the relationship between the ADHD symptoms and parental factors among 8 to 10 aged students. The results revealed that the percentage of students who hold ADHD symptoms were 8.8 according to A standardised Arabic version of the National Initiative for Children's Health Quality Vanderbilt Assessment Scale (Teachers questionnaire). Further, three parental factors were significant associated with ADHD which are low familial socioeconomic status, Poor maternal education status, and paternal occupation. However, the two above-mentioned studies and the studies in the Omani context have not manipulated any interventions or treatments as the proposed project. The current study would be of help to teachers on how to deal with ADHD students in the classrooms. It can also assist parents to find the proper way of how to behave with their children if they noticed that their children are suffering from the symptoms of ADHD.

3.Objectives and Research Questions

The purposes of current study are to investigate the effects of self-regulation strategy training (SRST) on ADHD students and to examine if this kind of training can increase students' attention and decrease hyperactivity disorders. Therefore, this study attempts to answer the following questions:

Research Questions 1 (RQ1): What is the effect of self-regulation strategy training on reducing the ADHD symptoms?

Research Questions 2 (RQ2): Can self-regulation strategies training increase students' attention and decrease hyperactivity disorders?

Research Questions 4 (RQ3): What are the teachers' and parents' perceptions towards SRST and students' behaviours after the intervention?

RQ1 and RQ2 were answered using the Conner's Scales and Behaviour rating scale whereas RQ3 was answered by interviewing teachers and parents and taking their opinion about the intervention.

4.Methodology

Research Design

This study adopted convergent parallel mixed methods design to merge the data collected quantitatively and qualitatively so that the researchers can gain a better understanding of the phenomenon of ADHD thoroughly. For the quantitative strand, single-case research (Mertens & McLaughlin, 2004) was used to obtain quantitative data using Conner's Scales and observation sheets, however, qualitative data were collected using interviews with parents and teachers, anecdotal records. The reason for choosing convergent parallel mixed methods design was to verify the quantitative data with qualitative data simultaneously as employing both of them concurrently usually yield trustworthy results. The independent variable for the quantitative strand was using the SRST and the dependent variables are attention deficit (AD) and hyperactivity disorders (HD).

Participants

The sample was from two schools studying in government schools in Al Batinah North Governorate in Oman. All six participants were in grade three and four with an average age

of 9 years old. As part of this study is single-cases research, there were only six cases and all students had ADHD symptoms as indicated by their teachers and parents screening by DMS-IV (Willcutt et al., 2012) and the Teachers' and Parents' Conner's Scales. To choose those six students, the researchers implemented the following procedures. First, the researchers chose two schools randomly to specify ADHD students in Al Batinah North Governorate. In these two schools, teachers were provided with DMS-IV which is a checklist that contains the most significant common symptoms that could ADHD students associate with. Forty students were found to possess ADHD characteristics among 676 students in school 1 and 730 in school 2. After a week, teachers filled in the Conners' Teachers Rating Scale and the number of ADHD students diminished to twenty students. One teacher completed the form for each student. The researchers randomly selected four students from one school and two other students from the other school. To verify that the results are consistent, parents were submitted the Conners' Parents Rating Scale to complete to gain concurrent validity-evidence. Then, parents signed a consent form and the researchers obtain child assent (Appendix A) and permission (Appendix B) was also received from the Ministry of Education in Oman to prove to implement the intervention. Moreover, a technology survey and a food questionnaire were distributed for parents to answer about their sons (Appendix C), child's daily routines (Appendix D), , the Conners' Teachers Rating Scales (Appendix E), the Conners' Parents Rating Scales (Appendix F), online interview observation sheet (Appendix G) and intervention strategy activities/forms (Append H:1: Goals, 2:Self-monitoring and 3:Self-evaluation). Table 1 shows some information about the participants in this study.

Table.1. Basic information about the participants

No.	Code	Gender	Grade	Age	DMS-IV Score (AD/HD)	ADHD Baseline raw score	Technology use
1	Rth1	M	3	9		33	
2	Rth2	M	3	9			
3	Zth25	M	4	10			
4	Zth26	M	4	10			
5	Zth29	F	4	10			
6	Zth30	M	4	10			

The setting

School 1 has 676 students and school 2 has 730 students. These two schools are near each other and they contain grades 1-4 students. The students learn different subjects in the schools and each class has a different level of students ranging from very low-level students to very high-level students. The classes also contain ADHD students, but without the identification of them as ADHD students; however, there is a class that contains learning difficulty students in each school. The intervention took place in the learning resources centre and the students' home. Students were requested to fill in some SRST forms with the help of the interventionists before they were doing their ongoing classroom activities in the schools some of them were done at the end of the school day. Also, some SRST forms were filled by the students at home with the help of the parents. During the classes, the interventionists did not intervene except they observed students while they were learning and in the break for 5-15 minutes depending on the period of the interview.

Procedure and Materials

The study was undertaken using the proposed intervention with the support of five interventionists. At the beginning of the intervention, the trainers provided the participants

with goal-setting (GS) forms and students completed the form fully with the help of the interventionists. These forms were as a planning stage of the training program where participants set goals that they can achieve during the period of the intervention on and the forms were given on a daily, weekly and monthly basis. In the coming weeks, trainers attended the schools for two months, three days a week. In these three days, students filled in several forms pertinent to self-monitoring (SM) where students monitored their progress in what they had planned during that week. In the self-evaluation (SE) stage, students evaluated their behaviours during the week and after a month. Some of these forms were repeated with different patterns to ensure that students are familiar with the metacognitive process and self-regulation skills. After eight weeks, the Conners' Teachers and Parents Rating Scales were administered again to assess if there were any effects of the SRST on ADHD students' behaviours, attention and hyperactivity. Furthermore, the researchers conducted semi-structured interviews with the parents and the teachers to verify the quantitative findings.

Data collections and data analysis

In this study, myriad instruments were used for the purpose of triangulation and to produce more valid and reliable results. These instruments and measures are DMS-IV, the Conners' Teachers and Parents Rating Scales, observation tool, anecdotal records, time and motions logs and interviews with teachers and parents. A description of each instrument is provided below.

DMS-IV. This measure was employed at the beginning of the study to identify the students who have ADHD symptoms or not. It also plays the role of providing information about the severity of the ADHD symptoms and it was as the baseline for the student's level of ADHD. This measure has two sections and under each section, there are nine items. Teachers and parents put a tick for the item that appears in the students' behaviours. For each section, if a student had six or more of the symptoms out of nine, he was rendered as an ADHD student.

The Conners' Teachers Rating Scale. This Scale was designed for the purpose of screening adolescent ADHD symptoms and it originally contains 28 items. For each item, there are 4 points ranging from Zero to 4 where Zero means not true at all and 4 means very much true. For the purpose of this study, the scale was modified to become 3 points only in the scales where zero means not observed, 1 means observed a little, 2 means observed too much. There are 18 items that measure hyperactivity disorders and 10 items measure attention deficit. The maximum score that can be obtained on this scale has a raw score of 56 points in total which indicates the participants has severe symptoms of ADHD. This score was deployed as a baseline for the intervention to be compared with the post-intervention score for each participant. The scale was translated and revised by three professors at Sohar University to obtain the content validity of the translation. For the purpose of reliability, the scale was given to three teachers in the post-intervention stage.

The Conners' Parents Rating Scale. This scale is similar to the Conners' Teachers Rating Scale and it underwent similar procedures. However, this scale was given to parents to assess their children's symptoms of ADHD at home before and after the intervention. This scale is different from the Conners' Teachers Rating Scale in that it has 24 items only, thus, the raw score of this scale is 48 points. This scale composes of 10 items for attention deficit and 14 items for hyperactivity disorders. This scale along with the Teachers Rating Scale was used for gaining criterion-related evidence as they together provided concurrent validity.

Behaviour rating scale. Each interventionist carries a tablet that contains a behaviour rating scale and this tool comprises seven questions pertinent to the behaviours of the participants.

Before the baseline, all Interventionists were trained on how to use the scale and were asked to observe students who were not participating in this study. In the treatment process, the Interventionists used the behaviour rating scale seven times during the intervention which means that it was randomly used one day during each week. This tool comprises three observed behaviours that are related to attention deficit such as, eye contact, deliberate silence and external appearance. On the other hand, there are 4 observed actions related to hyperactivity disorders which are body movement, Facial expressions, voice tone and hand movements. These observed behaviours are chosen from the most frequent features by ADHD children. The role of the interventionists was to indicate if the acts were observed 0 = too much or 1 = medium, 2 = little or 3 = no observed where 0 means a positive indicator of reducing the symptoms of ADHD and 4 showed a negative indicator of ADHD. Each observation period lasted from 5 to 15 minutes. To obtain reliable results, the participants were observed more than one time a week and by different Interventionists simultaneously.

Anecdotal records. The interventionists used this tool to record children's observed behaviours during school time whether in the classroom or outside the classroom. This type of Anecdotal records depicts specific and concrete descriptions for the participants. This tool is used as a triangulation method for the interviews and the Behaviour rating scale to obtain valid results.

Interviews with teachers and parents. During and after the intervention, the interventionists interviewed the teachers and the parents of the participants to explore any changes in the children's behaviours during and after the intervention. This qualitative data serves as a piece of supporting evidence for the quantitative data.

5.Results

Case One: Rth1 Student

Table.2. Results of Raw scores from the Conner's Teachers scale

Rth1	Teacher rating scale			
	ADHD (total raw scores)		AD	HD
Pre-intervention		33	12	21
Post-intervention		19	9	11
The difference		14	3	10

Table.2. indicates the results of Conner's scores from the student's teachers. From the table above, it can be seen that the intervention had a positive impact on this student's behaviour. The score was 21 before the intervention, but it decreased dramatically after the intervention to score 11; i.e., the difference between the two scores is 10. Before the intervention the child was observed with a high score in a number of hostile behaviours. According to the teachers says, the child was very hyperactive, bold and defiant, interrupts or intrudes on others and often runs about or climbs when and where it is not appropriate. However, after the intervention, the kid has changed and started to improve. The student's teachers have confirmed his improvement and they noticed that the child began to improve his unpleasant behaviours and respect others at school.

Item\ Intervention	Before	After
Very hyperactive	Observed a lot	Not observed
Bold and defiant	Observed a lot	Not observed
Interrupts or intrudes on others	Observed a lot	Not observed
Runs about or climbs when and where it is not appropriate.	Observed a lot	Not observed

Table.3. Examples of improved behaviours

On the other side, the collaborator and student's teachers noticed that this student couldn't have control over some of his behaviours, i.e., the intervention did not work in some points. Examples of these behaviours are presented in table.4.

Table.4. Examples of out of control behaviours

Item\ Intervention	Before	After
Disturb other children	Not observed	Observed a lot
gets up from his seat when remaining in the seat is expected.	Not observed	Slightly observed

Rth1	Teachers rating scale		
	ADHD	AD	HD
Pre-intervention	34	18	16
Post-intervention	24	16	8
The difference	10	2	8

Table.5. Results of Raw scores from the Conner's Parents' rating scale

Table.5. indicates the results of Conner's Parents' scores from the student's mother. From the table, it can be seen that the intervention had a positive impact on the student behaviours. The score was 16 before the intervention and decreased after the intervention to score 8: the difference between the two scores is 8. This intervention is reported by the child's mother. The student's mother was very helpful during the intervention and she was trying to show her son how to organize his time and how to be a polite and well-behaved child,

”بس دوري كأم أحاول دائما اوجهه و ما احرمه من اهتمامي وحناني“

Before the intervention, the student was very hyperactive and often run about or climbs, when and where it was not appropriate, and he got up from his seat when remaining in the seat was expected. However, the mother has noticed the changes after the intervention. The student's mother has reported that the child is quite more and better than before.

Table.6. Before and after invention behaviours

Item\ Intervention	Before	After
Not interested in doing his homework.	Observed a lot	Slightly observed
Intrudes others.	Observed a lot	Not observed
Shouts when he gets angry.	Observed a lot	Not observed
Does not follow the instructions.	Observed a lot	Not observed

The student's mother has confirmed the improvement after the intervention and how his behaviours improved in a good manner, as in table.6. Also, the child has started to prepare his lessons to do his homework and his marks improved, as his mother stated:

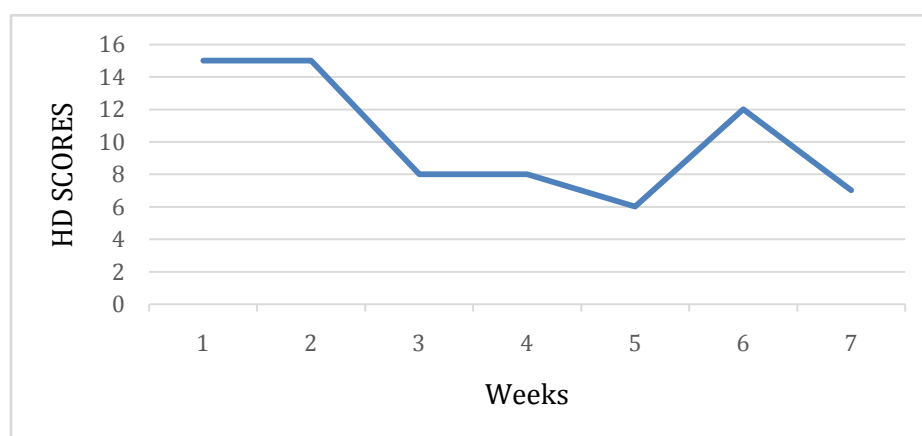
"يحب العلوم ويحب علامة زينة، والانجليزي يذاكره زين".

However, the child's mother has reported that some of the other behaviours have not changed or improved after the intervention. For example:

Table.7. Examples of unchanged behaviours

Item\ Intervention	Before	After
Very hyperactive.	Observed a lot	Observed a lot
Does not complete his homework.	Observed a lot	Observed a lot
runs about or climbs when and where it is not appropriate.	Observed a lot	Observed a lot
Angry and upset.	Slightly observed	Observed a lot

Figure.1 shows the student's HD behaviours while meeting/seeing the collaborator. It seems that the student has very high intervention during the first two weeks but then the HD scores dropped dramatically to score 8. After that it rises to reach 12 in week six. In the last week, the score decreased significantly which means that the intervention had a positive



impact and the student's behaviours had improved.

Figure.1. Results of the Behavioural Observation for Case 1

Case Two: Rth2 Student

Table.8. Results of Raw scores from the Conner's Teacher scale

Rth2	Teacher rating scale		
	ADHD (total raw scores)	AD	HD
Pre-intervention	40	19	21
Post-intervention	51	18	32
The difference	-11	1	-11

The above table (**Table.8.**) shows the results of Conner's scores from the student's teachers. From the table above, it can be seen that the intervention had a negative impact on student behaviour. The score was 21 before the intervention and it increased after the intervention to score 32, the difference between the two scores is -11. The student's case is one of the severe cases that require more attention and intensive assistance. This student is under medication from the Ministry of Health in Oman. Thus putting him in the intervention might require a long period of follow-up until the student's behaviours get improved. As shown in the table, that the percentage of his behaviours and hyperactivity increased dramatically, which means that the intervention did not benefit the student and improved his

behaviours in a better way. However, some of the student's behaviours have changed, for examples as shown in table.9.:

Table.9. Examples of improved behaviours

Item\ Intervention	Before	After
Does not read well.	Observed a lot	Slightly observed
Interrupts others.	Observed a lot	Slightly observed
Weak in Mathematics.	Observed a lot	Slightly observed

On the other side, the collaborator and student's teachers noticed that the student couldn't have control over some of his student's behaviours, in particular, the intervention did not work at some points. Table.10. shows examples of unchanged behaviours.

Table.10. Examples of out of control behaviours

Item\ Intervention	Before	After
Disturb other children	Not observed	Slightly observed
gets up from his seat when remaining in the seat is expected.	Observed a lot	Observed a lot
Bad handwriting.	Observed a lot	Observed a lot
Intrudes others.	Not observed	Slightly observed
Having sudden temper tantrums.	Not observed	Observed a lot
Very hyperactive.	Observed a lot	Observed a lot
Forgets what he/she studied before.	Observed a lot	Observed a lot
Having trouble waiting one's turn.	Observed slightly	Observed a lot

Table.11. Results of Raw scores from the Conner's Parents rating scale

Rth2	Parents rating scale		
	ADHD	AD	HD
Pre-intervention	40	20	20
Post-intervention	38	19	19
The difference	2	1	1

Table.11. shows the results of the intervention from the student's mother. The data reveals that the student had improved and his behaviours become better than before. The score was 20, but it dropped slightly after the intervention to 19, the difference between the two scores is 1. The student's case is one of the severe case, but some of his unpleasant behaviours has changed in a better way. The child's mother has confirmed that the student had improved,

"محمد الحمد لله الحين وايد احسن عن قبل معس زين يسولف ومع ابوه و اخوانه"

Before the intervention, the student was suffering from a number of problems related to hyperactivity and inattention, for example as seen in table.12.

Table.12. Examples of improved behaviours

Item\ Intervention	Before	After
runs about or climbs when and where it is not appropriate.	Observed a lot	Slightly observed
Having trouble waiting one's turn.	Observed a lot	Slightly observed
Does not follow the instruction.	Observed a lot	Slightly observed
Others are upset and annoyed from his behaviours.	Observed a lot	Slightly observed

After the intervention the mother has noticed the changes of her child, as in table.11. The student's mother has reported that the child is quite more and better than before in his study at school,

"دائما يقول ما كرموني وما كرموني واليوم كرموه، شكرا من القلب"

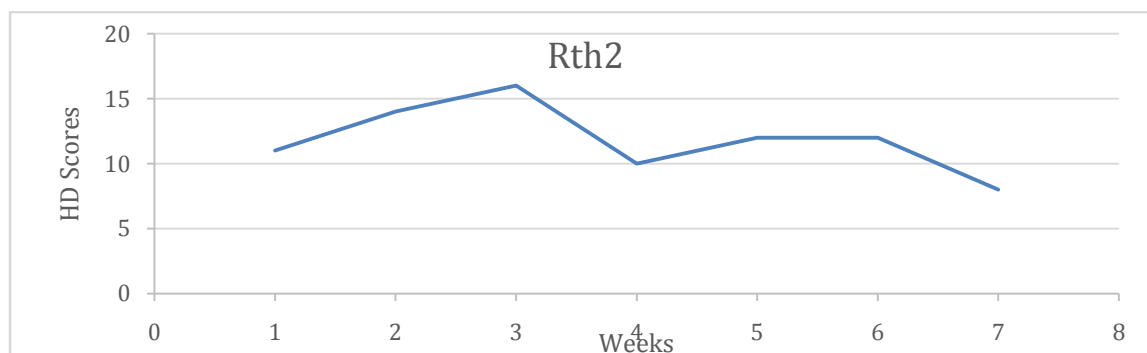
However, the Collaborator and student's mother couldn't have control over some of the other student's behaviours. In particular, the intervention did not work in some points. For example, as in table.13.

Table.13. Examples of unchanged behaviours

Item\ Intervention	Before	After
loses his temper quickly.	Observed a lot	Observed a lot
Not interested in studying and doing homework.	Observed a lot	Observed a lot
Messy and disorganized at school and at home.	Observed a lot	Observed a lot
Very hyperactive.	Observed a lot	Observed a lot
Does not complete his homework.	Observed a lot	Observed a lot
Does not want to do homework that require mental effort.	Observed a lot	Observed a lot
Shouts when he gets angry.	Observed a lot	Observed a lot

Figure 2 shows the student's HD behaviours while meeting the collaborator during the seven weeks. At the beginning, it seems that the HD score was low but then it rises dramatically to reach the peak. After that it dropped to score 10 in week 4. In the last week, the student's HD score was 8 which means that the student's behaviours had improved in a positive way.

Figure.2. Results of the Behavioural Observation for Case 2.



Case Three: Zth25 Student

Table.14. Results of Raw scores from the Conner's Teacher scale

Zth25	Teacher rating scale			
	ADHD (total raw scores)		AD	HD
Pre-intervention		38	16	22
Post-intervention		35	17	18
The difference		3	-1	4

Table.14. indicates the results of Conner's scores from the student's teachers. From the table above, it can be seen that the intervention had a positive impact on the student behaviours. The score was 22 before the intervention, but it decreased after the intervention

to score 18. Although there is a slight difference between the two scores, but this slight change made a big difference to the student and improves some of his desirable behaviours. According to the teacher says, the child was very aggressive, feisty and causes trouble at school. Also, his teacher noticed that the kid was often run about and climb when and where it is not appropriate. He usually got up from his seat when remaining in the seat was expected, disturbed other students and had trouble in waiting his turn. However, the student had improved and become quite, less hyperactive and doesn't cause much trouble as before. After the intervention, the student's teacher has confirmed his improvement, the child has stopped running about or climbing in inappropriate places and getting up from his seat, see table.15.

Table.15. Examples of improved behaviours

Item\ Intervention	Before	After
runs about or climbs when and where it is not appropriate.	Observed a lot	Not observed
gets up from his seat when remaining in the seat is expected.	Observed a lot	Not observed
disturb other students.	Observed a lot	Slightly observed
having trouble waiting one's turn.	Slightly observed	Not observed

On the other hand, the teachers and Collaborator had noticed that the intervention did not work as expected with the child. For instance, the child started to do some un observed behaviours that did not exist before the intervention. For examples, as in table.16.

Table.16. Examples of out of control behaviours

Item\ Intervention	Before	After
refuses what the adults ask him to do.	Not observed	Slightly observed
Having sudden temper tantrums.	Not observed	Observed a lot

Table.17. Results of Raw scores from the Conner's Parents rating scale

Zth25	Parents rating scale		
	ADHD	AD	HD
Pre-intervention	45	19	26
Post-intervention	38	18	20
The difference	7	1	6

The table shows the results of the intervention from the student's mother. The table reveals the improvement and the positive changes in the student behaviours at home. The score was 26, but it decreased after the intervention to 20, the difference between the two scores is 6. This intervention is reported by the student's mother. Before the intervention, the child was rioter, stubborn and fighting others at school and home,

"عند لو أقوله شي وانازعه الي يباه بيسويه بيسويه""تو جاييتي شكوى ضارب بنت في الباص".

Moreover, the kid's mother had confirmed that before the intervention her son was suffering from other unpleasant behaviours but after the intervention the child improved positively, see table.18.

Table.18. Examples of improved behaviours

Item\ Intervention	Before	After
Angry and upset.	Observed a lot	Slightly observed

Intrudes others.	Observed a lot	Slightly observed
loses his temper quickly.	Observed a lot	Not observed

After the intervention, most of the unpleasant habits and behaviours of the student has changed positively. According to the student mother says, the student has become quite and he shows more respect to his mother,

"الحمد لله اهدى عن اول " "من يومين من يرجع يحبني على الراس".

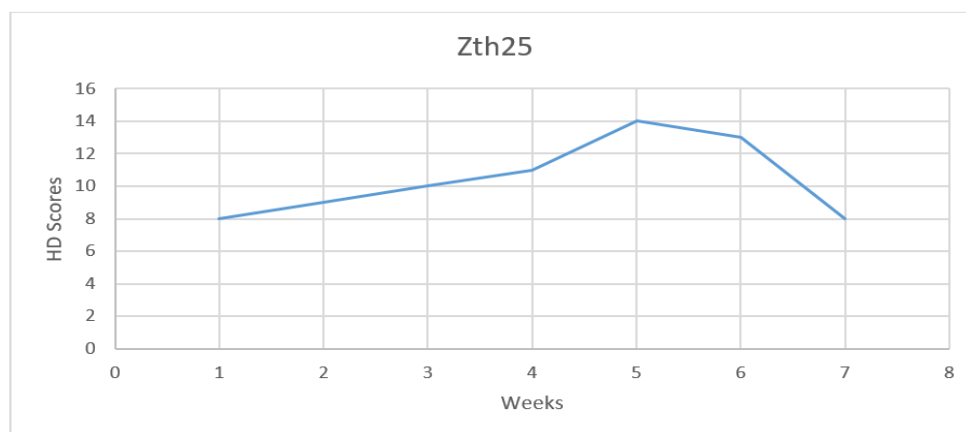
Furthermore, the student's mother has reported that her child does not lose his temper as before. On the other side, the Collaborator and student's mother couldn't have control over some of the other student's behaviours. In particular, the intervention did not work in some points. For example as in table.19.,

Table.19. Examples of unchanged behaviours

Item\ Intervention	Before	After
Disturb others.	Observed a lot	Observed a lot
Does not follow instructions.	Observed a lot	Observed a lot
Messy and disorganized at school and at home.	Observed a lot	Observed a lot
Very hyperactive.	Observed a lot	Observed a lot

Figure 3 shows the student's HD behaviours while seeing the collaborator during the intervention. At the beginning the score was 8 but then it decreased slowly from week 2 to week 5. In week 5 the HD score has reached the peak. After that the score dropped again until the last week of the intervention which means that the student's HD behaviours had improved in a positive way.

Figure.3. Results of the Behavioural Observation for Case 3



Case Four: Zth26 Student

Table.20. Results of Raw scores from the Conner's Teacher scale

Zth26	Teacher rating scale			
	ADHD (total raw scores)		AD	HD
Pre-intervention		50	18	32
Post-intervention		38	14	24
The difference		12	4	8

Table.20. shows the results of the intervention from the student's teachers. The numbers reveal that this student had improved and his behaviours become better than before. The score was 32 and it dropped after the intervention to 24; the difference between the two scores is 8. The child's teachers have confirmed his behaviours improvement after the intervention, "[Zth26] is smart student and he is doing his homework regularly":

"هو شاطر ويركز في مادة العلوم".

Before the intervention, the student showed high ADHD behaviours before the intervention, but the child had improved and had a control over some of these behaviours. For example, see table.21:

Table.21. Examples of slightly improved behaviours

Item\ Intervention	Before	After
Forgets the lessons that were taken before.	Observed a lot	Slightly observed
Having sudden temper tantrums.	Observed a lot	Slightly observed
Pays attention only to the things that interest him.	Observed a lot	Slightly observed
Having aggressive behaviours.	Observed a lot	Slightly observed

However, student's teachers stated that he couldn't have control over some of the other student's behaviours. In particular, the intervention did not work in some points. Examples are in table.22.

Table.22. Examples of unchanged behaviours

Item\ Intervention	Before	After
Very hyperactive.	Observed a lot	Observed a lot
Interrupts others.	Observed a lot	Observed a lot
runs about or climbs when and where it is not appropriate.	Observed a lot	Observed a lot
Intrudes others.	Observed a lot	Observed a lot

Table.23. Results of raw scores from the Conner's Parents rating scale

Zth26	Parents rating scale		
	ADHD	AD	HD
Pre-intervention	29	12	17
Post-intervention	25	10	15
The difference	4	2	2

Table.23. indicates the results of raw scores from the student's mother. From the table above, it can be seen that the intervention had a positive impact on the student behaviours. The score was 17 before the intervention and it decreased after the intervention to score 15.

Though, there is a slight difference between the two scores. However, his mother has confirmed that the student had become better at home and he is trying to improve his behaviours to become a good and quite kid. The child mother has said, " [Zth26] is better and he does not fight at home like before":

"الحمد لله أحسن عن قبل بوأيد وما وأيد يضارب تو"

Before the intervention, the child's mother has reported that her child was often desirable behaviours and she was suffering from that, but after the intervention he has changed and stopped doing these impolite behaviours. In particular, the table reveals the unpleasant behaviours for the student and the changes after the intervention:

Table.24. Examples of changed behaviours

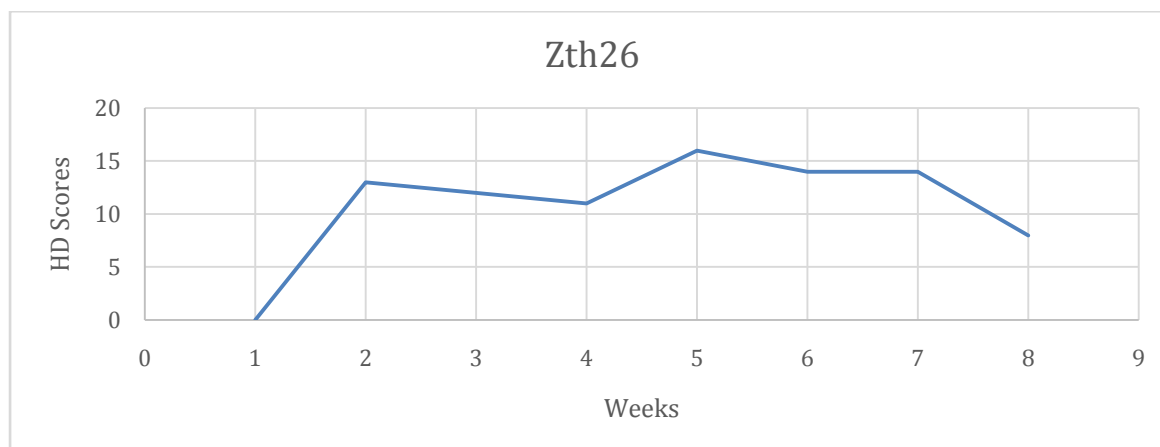
Item\ Intervention	Before	After
Does not complete his homework.	Slightly observed	Not observed
Angry and upset.	Observed a lot	Slightly observed
Does not want to do homework that require mental effort	Slightly observed	Not observed
runs about or climbs when and where it is not appropriate.	Observed a lot	Slightly observed
interrupts or intrudes on others.	Observed a lot	Slightly observed

On the other side, the Collaborator and student's mother couldn't have control over some of the other student's behaviours. In particular, the intervention did not work in some points. Examples are in table.25.

Item\ Intervention	Before	After
Disturb others.	Observed a lot	Observed a lot
Shouts when he gets angry.	Observed a lot	Observed a lot
Messy and disorganized at school and at home.	Slightly observed	Slightly observed
Very hyperactive.	Observed a lot	Observed a lot

Table.25. Examples of unchanged behaviours

Figure 4 shows the student's HD behaviours while seeing the collaborator during the intervention. There was a sharp increase in the student's HD scores in the first week. After that the score dropped slightly to reach 11 in week 4 but it rose dramatically again between week 5 and 6. In the last week of the intervention, the HD score decreased noticeably which means that the student's behaviours had improved in a positive way.

Figure.3. Results of the Behavioural Observation for Case 4

Case Five: Zth29 student

Zth29	Teacher rating scale			
	ADHD (total raw scores)		AD	HD
Pre-intervention		56	20	36
Post-intervention		41	18	23
The difference		15	2	13

Table.26. Results of Raw scores from the Conner's Teacher scale

The table shows the results of the intervention from the student's teachers. The table reveals the improvement and the positive changes in the student behaviours. The score was 36, but it dropped after the intervention to 23, the difference between the two scores is 13. This intervention is reported by the child's teachers. Before the intervention, the child's teacher had noticed many unpleasant behaviours ranked with a high score for the student that are related to hyperactivity and inattention. Examples are in table 27.

Table.27. Examples of improved behaviours

Item\ Intervention	Before	After
Very messy.	Observed a lot	Not observed
Intrudes others.	Observed a lot	Not observed
loses his temper quickly.	Observed a lot	Not observed
Takes the belongings of classmates.	Observed a lot	Not observed
Interrupts other children	Observed a lot	Not observed
Weak in Mathematics.	Observed a lot	Not observed
Disturb others.	Observed a lot	Slightly observed

After the intervention, the student's teacher confirmed the improvement of the kid, "[Zth29] is getting better and she is trying to read and write". Moreover, the teacher confirmed that the kid is trying to look neat and well-dressed in front of her classmates. However, the student teacher says has confirmed that the intervention was useful and the student has changed in a positive and better way.

On the other side, the student's teachers couldn't have control over some of the other student's behaviours. In particular, the intervention did not work in some points. For example

Table.28. Examples of unchanged behaviours

Item\ Intervention	Before	After
Does not read well.	Observed a lot	Observed a lot
Forgets what he/she studied before.	Observed a lot	Observed a lot
Not interested in studying.	Observed a lot	Observed a lot

Table.29. Results of raw scores from the Conner's Parents rating scale

Zth29	Parents rating scale		
	ADHD	AD	HD
Pre-intervention	45	19	26
Post-intervention	10	8	2
The difference	35	11	24

Table.29. indicates the results of Conner's scores from the student's mother. From the table above, it can be seen that the intervention had a positive impacts and the child had a control over her behaviours. The score was 26 before the intervention, but it decreased dramatically after the intervention to score 2, the difference between the two scores is 24. The intervention is confirmed by the student's mother, "[Zth29] was very hyperactive and noisy and she was given medication to treat hyperactivity". Also, the student was suffering from a problem, which is the habit of skipping to the bathroom when something bad happens or bothers her, and she used to watch TV a lot at home. Moreover, the child was having other unpleasant behaviours before the intervention, for examples as in table.30.

Table.30. Examples of improved behaviours

Item\ Intervention	Before	After
Very hyperactive.	Observed a lot	Slightly observed
Angry and upset.	Observed a lot	Not observed
Intrudes others.	Observed a lot	Not observed
quick- tempered.	Observed a lot	Not observed
runs about or climbs when and where it is not appropriate.	Observed a lot	Not observed
Messy and disorganized at school and at home.	Observed a lot	Not observed
Does not complete his homework.	Observed a lot	Not observed

After the intervention, most of the unpleasant habits and behaviours of the student has changed positively. According to the kid mother says, "[Zth29] has become very polite and she gave up her bad habit of skipping to the bathroom". Furthermore, the child's mother had confirmed that the student is much better in organizing her time at home between studying, playing with friends and watching the television and she started to learn how to read and write.

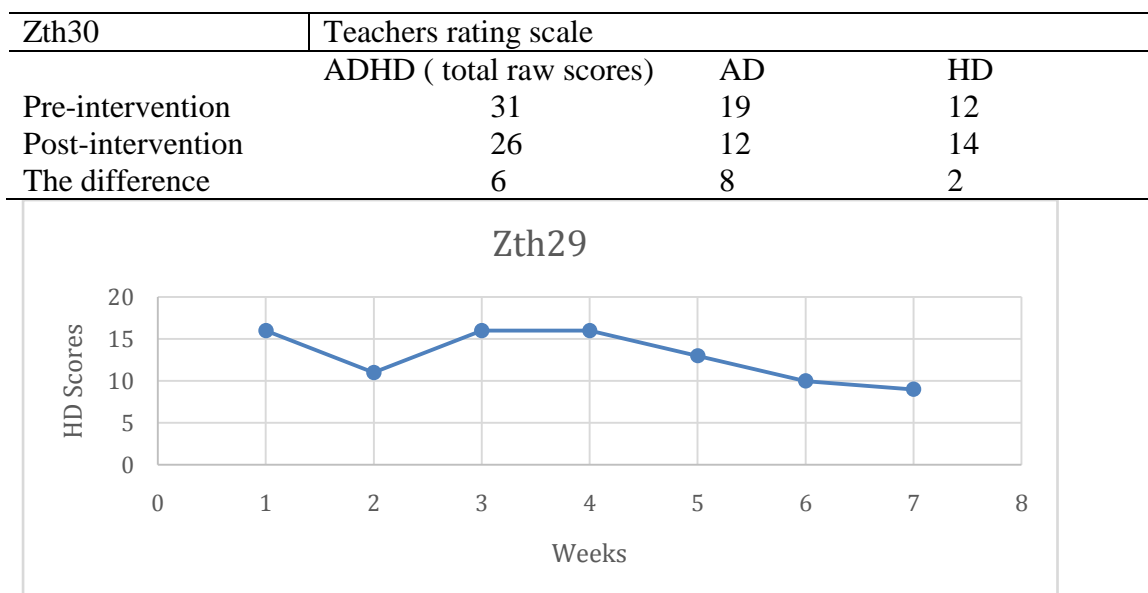
However, the Collaborator and student's mother couldn't have control over some of the other student's behaviours. In particular, the intervention did not work in some points. For examples in table.31.,

Table.31. Examples of unchanged behaviours

Item\ Intervention	Before	After
Does not want to do homework that require mental efforts.	Observed a lot	Observed a lot
Not interested in doing his homework.	Observed a lot	Observed a lot

Figure.5. shows the student's HD behaviours while seeing the collaborator during the intervention. The student's HD scores was very high in the first week. After that the score dropped slightly to reach 11 in week 2 but it rose dramatically again from week 2 to 4. In the last three weeks of the intervention, the HD score decreased significantly which means that the student's behaviours had improved in a positive way.

Figure.4. Results of the Behavioural Observation for Case 5



Case Six: Zth30 student

Table.32. Results of Raw scores from the Conner's Teacher scale

Table.32 indicates the results of Conner's scores from the student's teachers. From the table above, it can be seen that the intervention had a positive impact on the student's problem of inattention deviancies. The score was 19 before the intervention, but it decreased after the intervention to score 12, the difference between the two score is 8. This intervention is confirmed by the child's teachers, "[Zth30] does not participate in the class and his educational level still the same without any improvement",

"معي في الحصة نفس المستوى وما يشارك وايد"

The kid was having other inattention problems as well as hyperactivity before the intervention:

Table.32. Examples of improved behaviours

Item\ Intervention	Before	After
Does not read well.	Observed a lot	Not observed
Weak in Mathematics.	Observed a lot	Not observed
Not interested in studying his lessons.	Observed a lot	Not observed
Intrudes others.	Slightly observed	Not observed
Having sudden temper tantrums.	Slightly observed	Not observed

Also, the child's teacher has reported before the intervention, [Zth29] often does not give close attention to details or makes careless mistakes in schoolwork or other activities, is easily distracted, is forgetful in daily activities and very weak in mathematics.

After the intervention, the student's teacher noticed the difference and how the student had improved. This was reported by the student's teacher, "[Zth29] started to study his lessons at home and doing his homework, and he is quite now in the classes". Also, the kid attention in the lessons and his level in mathematics have improved,

"كتركيز ومتابعة الحصة افضل عن قبل"

On the other side, the student's teachers couldn't have control over some of the other student's behaviours. In particular, the intervention did not work in some points. For examples as in table.34.,

Table.34. Examples of unchanged behaviours

Item\ Intervention	Before	After
Very hyperactive.	Observed a lot	Observed a lot
Forgets what he/she studied before.	Observed a lot	Observed a lot
Runs about or climbs when and where it is not appropriate.	Not observed	Observed a lot
Bad handwriting.	Observed a lot	Observed a lot
Cannot be quite and calm.	Slightly observed	Observed a lot

Table.35. Results of raw scores from the Conner's Parents rating scale

Zth30	Parents rating scale		
	ADHD	AD	HD
Pre-intervention	23	9	14
Post-intervention	15	2	13
The difference	8	7	1

Table.35. shows the results of the intervention from the student's mother. The table reveals the improvement and the positive changes in the student inattention deviancies. The score was 9, but it decreased in noticeable manner after the intervention to 2, the difference between the two scores is 7. This intervention is reported by the student's mother. Before the intervention, the child very hyperactive, fails to finish schoolwork or duties, avoids or does not want to do homework that require a lot of mental effort for a long period of time, Cares only about things that interest him and Runs about or climbs when and where it is not appropriate.

Table.36. Examples of improved behaviours

Item\ Intervention	Before	After
Very hyperactive.	Slightly observed	Not observed
fails to finish schoolwork or duties.	Slightly observed	Not observed
Does not want to do homework that require mental effort.	Observed a lot	Not observed
Cares only about things that interest him.	Observed a lot	Not observed
Runs about or climbs when and where it is not appropriate.	Observed a lot	Not observed

The child's mother has confirmed that, "[Zth30] is very stubborn and he is facing some difficulties in doing homework",

"عندى وما يسمع الكلام ويواجه صعوبة في حل الواجبات"

Also, she explained her child case before the intervention, and how she was suffering with his bad behaviour:

"علي وايد متعيني بشكل حتى ما انا مره أخاف عن الا يسوي مصيبة في البيت"

However, the student mother has noticed his improvement in many things after the intervention and she confirmed that, "[Zth30] has changed a lot and become better than before, he washed his hands before the dinner and he becomes an obedient boy at home":

".... وايد متغير ومتحسن للأفضل وصاير يسوي المهام بروحه"

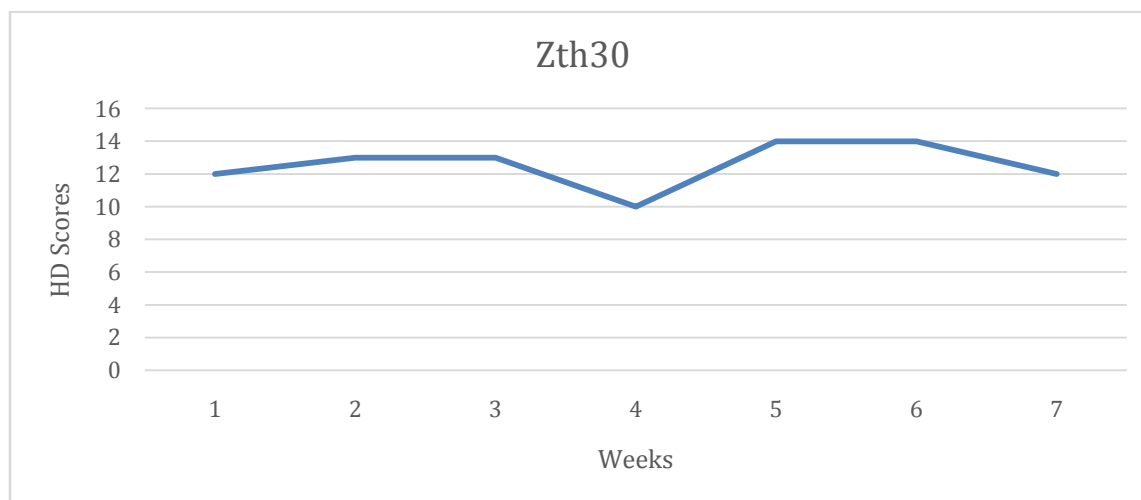
However, the Collaborator and student's mother couldn't have control over some of the other student's behaviours. In particular, the intervention did not work in some points. Examples are in table 37.

Table.37. Examples of out of control behaviours

Item\ Intervention	Before	After
Does not follow instructions	Not observed	Observed a lot
Disturb others.	Slightly observed	Observed a lot
Having trouble waiting one's turn.	Not observed	Observed a lot
Messy and disorganized at school and at home.	Slightly observed	Slightly observed

Figure 6 shows the student's HD behaviours while seeing the collaborator during the intervention. The student's HD scores was very high in the first three weeks. After that the score dropped slightly to reach 10 in week 4 but it rose dramatically again from week 4 to 5. In the last week of the intervention, the HD score decreased noticeably which means that the student's behaviours had improved in a positive way.

Figure.5. Results of the Behavioural Observation for Case 6



6.Conclusion

The aim of the study was to examine the effectiveness of using self-regulation strategies to help students reduce the symptoms of ADHD. As the results shows, students gained benefits from the training course using self-regulation strategies in although the results fluctuated from one student to another. It is recommended that this proposed training programme could be applied to for ADHD students in Oman. However, for future research, the researchers

would recommend that the sample should be larger so that the results can be generalized in other contexts of the world.

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