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Article in *International Journal of Developmental Disabilities* - September 2015

DOI: 10.1179/2047387715Y.0000000014

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To cite this article: Narges Adibsereshki, Maryam Shaydaei & Guita Movallali (2016): The effectiveness of emotional intelligence training on the adaptive behaviors of students with intellectual disability, International Journal of Developmental Disabilities

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The effectiveness of emotional intelligence training on the adaptive behaviors of students with intellectual disability

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Objectives: The aim of this paper is to present a study on the effectiveness of Emotional Intelligence (EI) training on the adaptive behaviors of students with intellectual disability.

Methods: This study was quasi-experimental involving a pre-test, post-test design and control group. The sample consisted of 32 students with intellectual disability (14–18 years old) who were educable. The sample randomly divided into the experimental group (16 students which were randomly divided into two groups of 8) and the control (16 students) groups. The experimental groups had 22 sessions of EI training and the control group did not have any; during the intervention, they just had the regular school program.

Results: The results showed that the intervention program had created a significant difference between the scores of the experimental and control group ($P < .001$) and the scores for adaptive behavior ($P < .001$), communication skills ($P < .001$) and social skills ($P < .001$) were increased in the experimental group, but this was not true for the daily living skills.

Discussion: It seems that the Emotional Intelligence training program can increase the adaptive behavior and its components (communication and social skills) of students with Intellectual Disability.

Keywords: emotional intelligence, adaptive skills, intellectual disability

Introduction

Intellectual disability (ID) is a developmental disability, which appears at birth or during childhood. According to AAIDD it is significant limitations in intellectual functioning, reasoning, learning, problem solving, and in adaptive behavior ranging from everyday social and practical skills. This disability originates before the age of 18 (Schalock *et al.* 2010). Compared to their peers, children with ID are behind in cognitive, communication, motor, and social skills. Cognitive disability and adaptive behavior deficit explain their problem-causing behavior (Tremblay *et al.* 2009). Based on the definition of intellectual disabilities, adaptive behaviors consist of cognitive skills such as language and literacy, money, number and time concepts, self direction, social skills like interpersonal relationships, social responsibility, self esteem, problem solving, and practical skills such as self-help, activities of daily living. Adaptive behavior skills play an important role in conceptualization and diagnosis of ID. People with ID experience difficulties that result

from significant limitation in the mentioned skills. DSM-5 also indicates three diagnostic criteria for ID: (1) deficit in intellectual functioning such as reasoning, problem solving, learning, practical understanding; (2) deficit in adaptive behaviors, which limits functions in one or more activities of daily life such as communication, social participation and independent living across home, school, work, and recreation; (3) onset of intellectual and adaptive deficits during developmental period (Tasse 2013).

Studies have not provided sufficient attention to the causal process of adaptive or maladaptive behavior. Few studies mention the mediators of growth in normal and abnormal cognition and conduct. They have talked about the conceptualization of emotions as a key in human development and behaviors, its impact on enhancing the adaptive behaviors and decreasing the maladaptive behaviors (Izard *et al.* 2008).

The importance of emotions and emotional intelligence

Emotional development is one of the primary tasks and continues through lifespan. Basic emotions (sadness, joy, anger, etc) start from infancy and infants rely on adults to regulate their emotion. As children's language develops, they use it for their emotion

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regulation and in middle childhood, peer relation also contributes to regulation of emotions McClure *et al.* (2009). Emotions can be seen as motivational components, emotion feelings (influencing cognition and action), and emotion utilization (adaptive cognition and action that can be facilitated by emotion regulation), which are the key to adaptive functioning (Izard 2007). Based on different theories and models of Emotional Intelligence (EI), definitions and explanations are varied. Some define EI as a set of abilities and some sees it as behaviors, motivation, beliefs and emotional skills (Mayer *et al.* 2000). MacCann *et al.* (2013) focus on ability conceptualization of EI, and consider EI as a second-stratum factor like fluid intelligence and visual processing in an expansion of Cattell–Horn–Carroll theory. Our study relates to those theories and studies focused on emotional and social abilities. Bar-On (1997) states that EI is a non cognitive intelligence and can be understood as an emotional, personal, and social abilities, skills that influence an individual's ability to cope effectively with environmental demands. Gardner (1983) explains the intelligence as intrapersonal (emotional) intelligence and interpersonal (social) intelligence. Saarni (1999) talks about emotional competence as interrelated emotional and social skills and that emotional-social intelligence is composed of intrapersonal and interpersonal competencies, the skills and facilitators for determining effective human behaviors. Being emotionally and socially intelligent means to effectively manage personal, social, and environmental change by coping with the immediate situation, solving problems, and making decisions. We need to manage emotions so that they work for us and not against us, and we need to be optimistic, positive, and self-motivated (Bar-On 2006).

Emotional capabilities such as perceiving and understanding emotions would be expected to support building and maintaining students' social support (Saklofske *et al.* 2012). Some research have shown that EI in children is linked to more peer nomination on prosaically behaviors and fewer on antisocial behaviors (Mavroveli *et al.* 2007; Petrides *et al.* 2006). Teachers also rated children with high trait EI scores as better adjusted compared to their pupils with low scores (Mavroveli *et al.* 2008).

Considerable research indicates that EI skills have an important role on children's academic, social, and personal lives beyond the affect of general intelligence (Brackett *et al.*, 2005). The concept of EI has inspired numerous schools to have social and emotional learning and training programs. However, there has been some debate about how EI should be defined and assessed, and what it may predict (Lopes *et al.* 2003). A component of EI, which appears to support students in learning environment

is emotion regulation. Individuals who have the ability to regulate their emotions are better able to manage their stress. If a child in a supportive social context learns adequate emotion knowledge and understands emotion, he/she can utilize the energy and motivation in anger for positive self assertion instead of yelling and hitting, or an adolescent can utilize the energy to reach out for social support from family and friends instead of withdrawing from the situation and causing sadness (Izard *et al.* 2008). Teaching child to link the cognitive techniques of emotion regulation to emotion feeling can facilitate child's emotion utilization and enhance the development of adaptive behaviors (Izard 2002; Izard *et al.* 2008).

Many studies in the area of emotion regulation in individuals with ID address the early part of the regulatory process. Research shows that individuals with ID can identify their emotion (Lindsay *et al.* 2004; Lindsay *et al.* 1994; Rose and West 1999), recognize and label others' facial expression (Moore 2001), and improve this skill by training (Rydin-Orwin *et al.* 1999; Stewart and Singh 1995). Moore (2001) after his review concluded that people with ID have the ability to discriminate pleasant versus unpleasant emotions. They have difficulty labeling specific emotion (Owen *et al.* 2001) but they label some emotions such as happiness easier than others. The research on the later end of emotion regulation have focused on self regulation and behavior regulation, two constructs that overlap with emotion regulation.

It seems that EI has a considerable impact on our behavior. Salovey and Mayer (1990) state that when people approach life tasks with EI, they have an advantage for solving problems adaptively. With such skills they can be more creative and flexible in arriving to alternatives and intervene in problems. In choosing alternatives, they try to integrate emotional consideration, and these kinds of approaches lead to behavior, which is respectful to internal experiences of themselves and others. Thus individuals with developed EI skills 'understand and express their own emotions, recognize emotions in others, regulate affect, and use moods and emotions to motivate adaptive behaviors' (Salovey and Mayer 1990; p. 200). Goleman (1995, 1998) states that EI can be taught and learned and since children with ID have some limitations in their adaptive behavior and emotional skills, the aim of this study was to investigate if training EI skills could be effective for enhancing the adaptive behaviors of students with intellectual disabilities.

Method

The method applied in this study was quasi-experimental with pre-test, post-test, and a follow-up test. The Raw V-scale scores were used for the statistical analysis in this research.

Participants

The accessible sampling was used, which included of 32 female students recruited by special school for children with ID aged 14–18 years old. They came from middle class families and were educable (IQ of 58–70). Their academic problems were almost at the same level and did not have any other disorders. The sample was randomly divided into two groups: the experimental group and the control group (16 students in each group). In order to gain higher training outcomes given the slower learning pace of students with ID, and to monitor and control the situation by the instructor, the experimental group was divided into two groups of eight students and received EI training.

Procedure

The package was prepared according to Bar-On (1997) program and Dehshiri (2002), and adapted for students with ID. There were 22 sessions of 45 minutes instruction. The researcher with the help of a psychologist (who had experience in this field) conveyed the instructions. Students in experimental groups were offered the same activities and assignments such as role playing, reading stories, using pictures, and doing homework. In some sessions, we arranged some hypothetical events and examples for the children to learn those skills, and they were asked to talk about those events and the consequences (more details in the Appendix).

In our study, for the improvement of students' skills, the instructor tried to use techniques such as simplifying and repeating. Koul and Clapsaddle (2006) stated that repeated listening experiences play a significant role in the perception of synthetic speech for individuals with mild-to-moderate intellectual disabilities as well as in participants without disability. In some sessions of our training, students read the stories related to emotion concepts, talked about the story and the main points. They also wrote some sentences describing the concept and their opinion about it, and in cases where there were misunderstandings, appropriate feedbacks and supports were given to them. By participating in group work, the students tried to learn some skills such as acknowledging each other, taking responsibilities, sharing, offering help, and allowing others to express their opinion (Elliott *et al.* 2001; Raudeliūnaitė and Paigozina 2009). The students worked on how they could control themselves when communicating and perform collective activities, be flexible, express their emotions in an acceptable manner, be able to understand others' emotion and mood (sometimes by their facial expression, voice, etc), be sensitive to them and react adequately (e.g. if somebody is crying, you could/should show empathy) (Kaffemaniene and Jureviciene 2012; Malinauskas 2004).

For the two groups (experimental and control), the pre-test was carried out before the intervention starts and the post-test was done after the intervention. Six weeks after the post-test, experimental group had the follow up test.

The instrument

Vineland adaptive behavior scale: The Vineland Adaptive Behavior Scales (VABS) were designed to assess handicapped and non-handicapped persons from birth to adulthood in their personal and social functioning. The VABS is organized around four Behavioral Domains: Communication, Daily Living Skills, Socialization, and Motor skills. In our study, one of the parents of the children with ID filled out the questionnaire. The Vineland scale, which was normalized in Iran by Baraheni (2004), was used in this study. The reliability was obtained from retesting the major areas in the scale, which was 0.85–0.90. The validity was measured by the contents validity in the scale, the progress of Vineland's developmental scores in different age groups, and the mean score of 100 samples (50 with ID and 50 with normal ones). The increase in the scores for different age groups and the significant difference in the mean score of the two groups (children with ID and without disability) indicate the validity of the scale contents.

The three domains considered in this study were:

1. Communication domain:

Receptive: if the person listens and pays attention and what he/she understands.

Expressive: what the person says, how he or she uses word and sentences to gather and provide information to express things.

Written: what the person understands about how to use letters to make words, and what he/she read and writes.

2. Socialization Domain:

Interpersonal relationships: how the person interacts with others?

Play and leisure time: how the person plays and uses leisure time?

Coping skills: how the individual takes responsibility and is sensitive to others?

3. Daily living skills domain:

Personal: How the person eats, dresses, and do personal hygiene?

Domestic: What the person does at home (the tasks)?

Community: How the person uses time, money, telephone, job skills?

Results

The age of participants was between 14 and 18 and the mean and standard deviation of their age was 15.96 ± 1.25 .

Table 1 shows a significant difference between the scores of experimental and control groups, which means after the intervention, students in experimental groups had higher scores than control group. The mean scores in experimental groups show that students' scores in pre-test, post-test, and follow-ups of adaptive behavior (87.31–101.43, 87.31–99.65), and two of its components; communication (28.37–33.56, 28.37–32.31) and social skills (28.93.88–36.12, 28.93–35.22) were increased and they were significant too. The mean scores in follow-ups were slightly lower than post tests. The mean scores for life skills were increased from pre-test to post-test and pre-test to follow-up (30.00–31.75, 30.00–30.77) but the differences were not significant.

These findings are shown in the Figs. 1–4.

Table 2 shows the Leven test for <0.05 in all variables is not significant, so the condition for analysis of variance would be OK.

Table 3 shows the analysis of variance in which the scores in adaptive behavior ($F(1,28)=8.44$, $P<0.001$) and its components: communication skills ($F(1,28)=9.58$, $P<0.001$) and social skills ($F(1,28)=8.82$, $P<0.001$) are significant, but for the life, skills are not ($F(1,28)=0.580$, $P<0.861$). The students' scores for communication skills, social skills, and adaptive behavior in experimental group are higher than the control group, but this result is not true for life skills scores. Also the effect sizes show that training was effective in some areas. For adaptive behaviors 48%, social skills 47%, and communication 29% of the effectiveness were from the training. For the daily living skills, the effect size is 0.01, which means the training was not effective in this area.

Table 4 shows the results of Bonferoni *post Hoc* test, which investigates the difference between the means and indicates a significant difference between the pre-test, post-test, and pre-test, follow-up of adaptive behavior and two of its components; communication skills and social skills. There is not a significant difference between post-tests and follow ups.

Discussion

It seems that emotions and EI skills can make considerable contributions to the behavioral functioning of children. As our results showed, the experimental groups had higher scores of adaptive behaviors than control group, which means EI training had some positive effects on certain aspects of adaptive behaviors of female students with intellectual disabilities. Some studies worked on EI education programs (Finley *et al.* 2000; Gore 2000; Kolb and Weede 2001) and concluded that children who experienced these kinds of programs had higher EI, and some other argued that children's abilities in recognizing, understanding, and managing emotions could be raised by these programs (Ulutas and Ömerog lu 2007; Bennet and Knight 1996; Bruno *et al.* 2002; Grinspan *et al.* 2003). For example, Downs and Strand (2008) designed an emotion recognition training program for young children with developmental delay and the result of their study showed significant growth in emotion recognition skill and higher scores on emotional understanding ability. The study of Abe (2011) indicated the role of positive emotions and EI in adaptive functioning and their effects on experiential learning. Both emotion variables and EI are likely associated with adaptive intrapersonal and interpersonal functioning which facilitate the experiential learning. They also are psychological and social resources for coping with the challenges of developmental stages of learning experience (Sweitzer and King 2008).

Our results also indicated that through EI training, the scores of social and communication skills of students were increased. Schutte *et al.* (2001) examined the link between EI and interpersonal relations in seven studies. The results of these studies indicated higher EI scores related to higher scores in empathy, self-monitoring, social situations, social skills, cooperative responses, and close and affectionate relationships. The higher EI in girls than boys (Katyul and Awasthi 2005; Wing and Love 2001; Singh 2002), which could be related to girl's being

Table 1 Mean and standard deviation of the total scores of adaptive behavior and its components in pre-test, post-test, and follow-up

Variables	Pre-test, mean \pm SD	Post-test, mean \pm SD	Follow-up, mean \pm SD
Communicat skills			
Experimental	28.37 \pm 5.43	33.56 \pm 3.46	32.31 \pm 3.35
Control	29.59 \pm 3.93	29.37 \pm 3.73	29.97 \pm 3.75
Daily living skills			
Experimental	30.00 \pm 5.09	31.75 \pm 4.15	30.77 \pm 3.95
Control	28.75 \pm 3.13	27.81 \pm 3.05	27.85 \pm 3.05
Socialization skills			
Experimental	28.93 \pm 3.88	36.12 \pm 3.61	35.22 \pm 3.01
Control	29.81 \pm 5.35	30.18 \pm 5.15	30.28 \pm 4.65
Adaptive behavior			
Experimental	87.31 \pm 6.53	101.43 \pm 7.87	99.65 \pm 7.37
Control	88.12 \pm 6.98	87.37 \pm 8.50	87.67 \pm 6.50

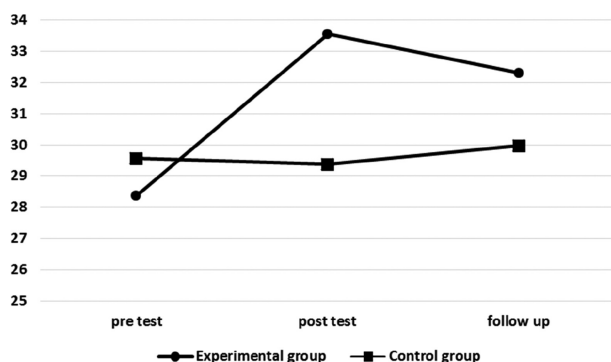


Figure 1 The mean scores in pre-, post- and follow-up tests for communication skills in experimental and control groups.

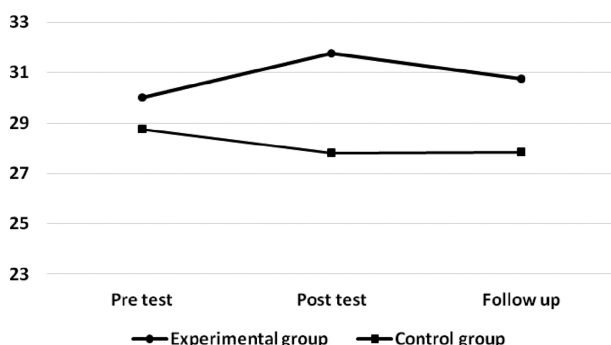


Figure 2 The mean scores in pre-, post- and follow-up tests for daily living skills in experimental and control groups.

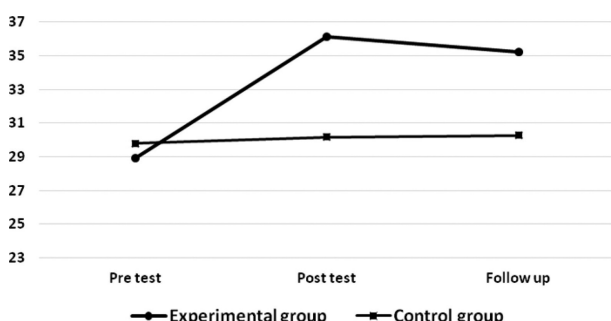


Figure 3 The mean scores in pre-, post- and follow-up tests for social skills in experimental and control groups.

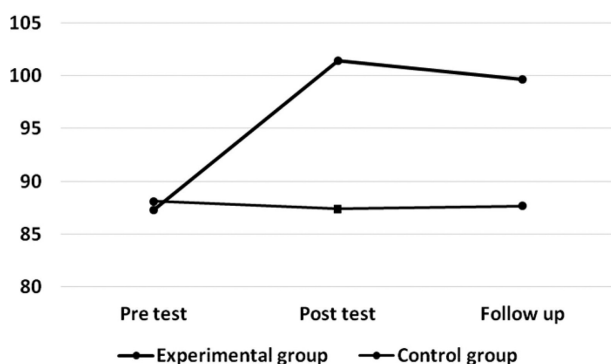


Figure 4 The mean scores in pre-, post- and follow-up tests for adaptive behaviors in experimental and control groups.

Table 2 Leven test for homogeneity of variances

Variables	F	Df1	Df2	P
Communicat skills				
Pre-test	0.07	1	30	0.79
Post-test	0.03	1	30	0.85
follow up	0.07	1	30	0.79
Daily living skills				
Pre-test	0.77	1	30	0.89
Post-test	0.33	1	30	0.55
Follow-up	0.57	1	30	0.79
Socialization skills				
Pre-test	0.67	1	30	0.69
Post-test	0.05	1	30	0.75
Follow-up	0.37	1	30	0.39
Adaptive behavior				
Pre-test	0.85	1	30	0.93
Post-test	2.08	1	30	0.06
Follow-up	0.97	1	30	0.79

emotional and intimate in relationships, and also their personality traits such as empathy, social responsibilities and interpersonal relationships, can help them to acquire more EI as compared to boys. Izard (2007) talks about emotional feelings and its influence on cognition and action and adaptive functions. It seems emotional information processing can lead to emotional knowledge that contributes to emotion utilization by appropriate interpersonal interactions and adaptive social behaviors (Denham et al. 2003; Izard et al. 2001; Trentacosta and Izard 2007). Petrovici and Dobrescu (2014) mentioned that EI focuses on basic human skills. The ability to control feelings and the potential for creating positive interaction and effective communication constitute an example of EI in action. Study of Baurain et al. (2013) indicated that children with intellectual disabilities who listened to and followed instructions, who waited for their turn, controlled their externalized behavior were perceived by their teachers as socially adapted in their daily social relationships. Nieuwenhuijzen and Vriens (2012) concluded that inhibition, working memory, emotional recognition, and interpretation predict social processing of children with ID, especially emotional recognition and interpretation. They expressed that good interpretation and emotional recognition predict social problem solving skills. Izard et al. (2008) stated positive behavior outcomes may come from effective emotion information processing, appropriate emotional knowledge, which lead to emotion regulation and emotion utilization. Fostering development of emotional knowledge can help children to regulate and utilize their emotions in the social interactions where communication and adaptive behavior depend on accurate detection and interpretation of emotion signals (face, voice, body). Moore (2001) indicated that individuals with mild and moderate ID can recognize and label facial

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Table 3 Analysis of variances

Variables	SS	df	MS	F	P	Effect size
Communicat skills						
Group	672.76	1	186.39	9.58	0.001	0.29
Error	254.88	28	22.06			
Daily living skills						
Group	22.76	1	22.76	0.58	0.861	0.01
Error	232.82	28	22.06			
Socialization skills						
Group	572.76	1	572.76	8.82	0.001	0.47
Error	232.82	28	22.06			
Adaptive behavior						
Group	372.79	1	186.39	8.44	0.001	0.48
Error	1654.88	28	22.06			

Table 4 The results of Bonferoni post Hoc test

Variables	MD	Std. Error	P
Communication skills			
Pre-test	-5.188	1.201	0.001
Pre-test-follow up	-2.594	0.601	0.001
Post-test-follow up	0.765	0.103	0.064
Socialization skills			
Pre-test-post-test	-7.188	.945	.001
Pre-test-follow up	-3.594	.473	.001
Post-test-follow up	0.963	0.103	0.164
Adaptive behavior			
Pre-test-post-test	-14.125	2.211	0.001
Pre-test-follow up	-7.063	1.106	0.001
Post-test-follow up	0.675	0.103	0.057

expressions of others and with some training, they can improve this skill (Rydin-Orwin *et al.* 1999; Stewart and Singh 1995).

The findings of our study for daily living skills showed that there was some improvement in this area, but it was not significant like other areas of adaptive behaviors. This result contradicts with some other research findings such as Bastian *et al.* (2005) study. They focused on different aspects of life skills such as life satisfaction, problem solving, coping abilities, and lower anxiety. Their results showed that higher EI was associated with the life skills. Study of Salovey *et al.* (2000) which consider the relation between EI, stress, and coping strategies suggested that more emotionally intelligent individuals are successful in meeting demands in stressful situations. They argued that EI is related to a number of coping processes and higher EI is associated with better coping and use of more effective coping strategies. The contradiction between our result and two mentioned studies may come from different life skills components, and the samples in which in this study participants were students with ID. Another reason could be the number of components considered in daily living area, which were more than the communication and social skills area and some of these components (such as using public phone, handling money for different purposes) probably were not related to the instruction materials and were not addressed. The parents' expectation

could be a reason as well. Due to the high occurrence of the daily living skills, these tasks may be more noticeable for parents and they probably expected more of their children (Taylor *et al.* 2010), especially after the intervention program.

As it was indicated in our findings, the follow up scores were slightly lower than the post-test scores. It seems passing times could weaken the effects of intervention programs for students with ID. Individual with intellectual disabilities have memory problems which should be considered in every training program. Thus, for having longer and stable effectiveness, it is better that these kinds of programs to be continues and apply some strategies which could help the memory process and learning stability, for example; exposing people with ID to deep rather than shallow encoding, using visual scaffolding when teaching verbal material, the memory tests which are based on recognition instead of free recall and use various types of questions, teach individuals with ID memory strategies even though they might only be used later in life (memory could improve with age), and using video spatial instructions more (Lifshitz *et al.* 2010).

Limitations

This study had some limitations such as no accessibility to an appropriate instrument for measuring the EI of children with ID and relied on the observation of the trainer. The researchers tried their best to control the variables, which could affect the results of this study but they might not have been able to control all of them.

Acknowledgements

Thanks to the University of Social Welfare and Rehabilitation Sciences, Special Education Organization, students with ID and the personnel and teachers of special schools whom helped us in this study.

Disclaimer Statements

Contributors ND was responsible for the development of original idea, study concept and writing the

manuscript; MS was responsible for the study concept and design, collecting and analysis of data; GM was responsible for the study concept and analysis of data.

Funding None.

Conflicts of interest None.

Ethics approval Our study was not clinical. We worked with students and had the permission of the Special School for carrying our study.

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Appendix

The concepts presented in the training sessions were included of:

Session 1: Emotional self-awareness; drawing different faces (sad, happy, excited, etc), write the name of these emotion

under the faces to understand the emotional states, reading a story and talk and write about the moods and emotions of characters. Session 2,3: Self-respect and self confidence; reading related stories to this concept, questioning and answering about the characters of the story to understand this concept.

Session 4,5: Independence, responsibility and group concepts; for understanding independence we read a story and had some discussions about the characters and used role playing for showing different social situations of the story.

Session 6,7: Self-assertiveness and understanding the assertive behaviors in interpersonal relationships. Examples and role playing about how can they respect others rights and defend their own rights, how can they reject inappropriate requests and don't ask for inappropriate requests themselves, also how can they behave in difficult situations and have courage and decisiveness, rather than aggressive behavior.

Session 8,9: Empathy and its role in interpersonal communication. By giving a simple definition, examples and role playing (for example two friends that one of them had a death in her close family; the reaction and support of another friend could be empathy).

Session 10,11: Interpersonal communication skills. Examples of different kinds of communication such as expressive and receptive.

Session 12,13: Problem solving and decision making skills; by examples and putting individuals in situations which she had to decide what to do, students were taught how to think step by step and consider various choices.

Session 14,15: Some of the goals of life, the realities and the role of flexibility in life were introduced. Some examples were given to students and for practice asking them set a goal and talk about different ways of reaching that goal.

Session 16,17: The definition of stress and different ways to deal with stress; the instructor described stress by talking about some symptoms (increase of heart beat, sweating, etc) and gave some examples of stressful situations. Learning how to face stressful events (such as positive self talks) and how to control strong emotions will help them understand and manage the stress.

Session 18,19: The concept of aggression and ways to deal with it; The causes of aggression and its effect on the failure of interpersonal relationships (friends and family) were introduced. Also discussion about the concept of anger and its outcomes were carried out.

Session 20,21: Functions of happiness and optimism; Children learned how to be optimistic and try to have positive thoughts rather than angry thoughts, positive thoughts are welcomed.

Session 22: The summary of main points and also answering students questions.