

Research article Ερευνητική εργασία

Challenging behaviours on people with autism: A case study on the effect of a residential training programme based on structured teaching and TEACCH method

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The purpose of the study is the investigation of how effective could be one of the first residential training programmes based on structured teaching and the principles of TEACCH method, in declining the frequency of challenging behaviours in adolescents and adults with autism, who had never received any kind of intervention or training. Functional assessment records (ABC) were analysed for each participant and frequencies of challenging behaviours were summarised for three deferent periods of time (beginning of the programme, after 12 and 18 months). The results showed significant decline of challenging behaviours frequency after the start of the training programme. The implications of the results in particular will be valuable for further research and service developments in Greece by the Greek Society for the Protection of Autistic People.

Key words: Autism in Greece, challenging behaviour, residence, TEACCH, structured teaching, adults with autism.

Autism is a complicated disorder and in many cases is accompanied by a variety of behavioural problems or odd behaviours. One big parameter of autism is challenging behaviours. A great number of people who have autism engage behaviours that are violent or destructive (Frith,¹ Aarons²). These aggressive ac-

tions may be directed towards property or other persons such as caregivers, family members, and other people with learning disabilities or to self with self-injurious behaviours. During the years therapists in a variety of settings try to respond to these behaviours by the use of medication and training programmes.

However, there are not many studies evaluating the effectiveness of educational programmes. For this reason the study investigated if and how effective is in reducing challenging behaviours on adults with autism (who live in residential settings), a training programme based on the principles of Treatment and Education of Autistic and related Communication Handicapped Children (TEACCH) and structured teaching. In addition the residents had never in their life received any kind of educational programme (Schopler,³ Schopler⁴). Additionally it is useful to see what exactly means the term Challenging Behaviours according to Rojahn,⁵ Murphy,⁶ and Emerson.⁷

Challenging behaviours

The term Challenging Behaviours is used by the services responsible for people with learning disabilities in the United Kingdom (McGill,⁸ Kierman⁹). Challenging behaviours are defined as: "culturally abnormal behaviours of such intensity, frequency or duration that the physical safety of the person or others is likely to be placed in serious jeopardy, or behaviour which is likely to seriously limit use of, or result in denial of access to ordinary community facilities" (Emerson⁷). Such behaviours include self-injury, aggression, and destruction of the environment, sexually inappropriate acts, fire setting, faecal smearing, stereotyped mannerisms and a range of other behaviours (Rojahn,⁵ Murphy,⁶ Emerson⁷). Aspects for calling some behaviours challenging are the location, the frequency, the intensity, and the duration where the behaviour occurs (Emerson¹⁰). Over the years many kinds of methods were designed to assess challenging behaviours in order to understand their nature and eliminate everything that causes them. However the studies that investigated the effectiveness of TEACCH method and structured teaching or similar training programmes are limited (Schopler³).

Background and reasons for interest in the area/ Aims and Objectives of the Study According Jordan¹¹ there are not many studies that present the effectiveness of training programmes such as TEACCH method on people with autism. Those that are available even if they present gains in many areas cannot be held to be conclusive about the effectiveness of an intervention because they have methodologi-

cal weaknesses. Nevertheless, most of the reported studies on the effectiveness of TEACCH in autism do show gains. Panerai¹² and Panerai¹³ presented that TEACCH method was effective in spontaneous communication and reducing challenging behaviours on the children with autism they studied in classroom settings. Norgate¹⁴ describes a case of a 12-year-old partially blind boy with severe learning disabilities and severe challenging behaviours. The researcher inspected the Antecedent-Behaviour-Consequence (ABC) notes for the case and introduced the TEACCH programme. The results showed that the level of challenging behaviours was reduced following the use of TEACCH method. Although it cannot be conclusive that TEACCH method was a crucial aspect for declining challenging behaviours. In two similar case studies (two boys 16 and 19 years old) Cox¹⁵ believe that programmes developed through TEACCH typically respond positively to aggressive and self-injurious behaviours. The two boys were presenting extreme self-injurious and aggressive behaviours. After the use of an intervention programme based on the TEACCH philosophy the researchers found a decline in aggressive and self-injurious behaviours (Cox¹⁵).

However, there are extremely limited studies examining the effectiveness of TEACCH method in adolescents and adults or in residential settings. The available studies are focused on children or people with autism that have been following a TEACCH programme for long time. The current case study follows a study at the same residence, which found that the residential programme helped participants to improve skills such as personal independence skills, social abilities and functional communication (Siaperas¹⁶). Following that, this research study investigates if a training programme based on structured teaching and TEACCH principles has any effect in reducing challenging behaviours on people with autism institutionalised for long time, or at home without having any kind of similar intervention.

Another challenging part of the current study is to investigate how many of the participants benefited of the programme. If there is a high number of residents that were improved thorough the programme it will be another fact on the view that just deinstitutionalisation and normalization principle is not enough in helping people with developmental disabilities, but

guiding concepts are needed clearer and responsive to clients' personal needs as TEACCH method implies (Mesibov¹⁷). A good example of that view is a total population study of 616 people with intellectual disabilities presenting self-injurious behaviours; 28% of them were leaving at residential settings (Oliver¹⁸).

Method

Design

The study is a single factor (related samples) repeated measures design, looking at changes over time. The independent variable is the residential training programme with three levels (Time I=beginning of the programme, Time II=after 12 months, and Time III=after 18 months). The dependent variable is the change over time in challenging behaviours on people with autism who live in the residence (Harris,¹⁹ Heiman²⁰).

Analysis

The data analysis was done with non-parametric test, specifically with Friedman Chi Square test for each cluster (category) of behaviours separately for Time I, II, III and the mean score of all six cluster of challenging behaviours for Time I, II, and III (Beasley,²¹ Everitt,²² Harris,¹⁹ Howel²³).

The residential training programme based on TEACCH and Structure Teaching: The first residential home that provides accommodation for twelve persons diagnosed with pervasive developmental disorders-autism developed in Greece by the Greek Society for the Protection of Autistic People. The staff-team had training for two weeks before the beginning of the programme on TEACCH principles. Also the staff-team had in-service training on TEACCH method after the beginning of the programme. The basic elements of the training programme based on TEACCH method and structured teaching at the residence were:

1. Focus on the person's with autism skills, needs and interests with an emphasis on individualised assessment. Diagnostic assessment techniques were used in order to develop the optimum individualised programme (Mesibov²⁴).
2. Sharing of information between professional and parent was a basic element of the residential programme. Parents were informed about the training

programme. The transition, from living at home or any mental health institution to living at the residence, was done with the family help.

3. Daily schedules based on TEACCH were used. A schedule tells visually what activities will occur and in which order. The majority of the schedules were pictures arranged from top to bottom. Depending on each person's developmental level, certain objects were used in order to help the person to understand a sequence of events (Faherty²⁵). In addition visual prompts were employed to maximise success in the daily activities such as making tea (e.g. on the cupboard a photo of a cup).
4. Transition area. Schedules were displayed in a special area called "transition area", which means that each member of the residence could look at what activities he/she had to do. By that way he/she is helped to orientate a change from one activity to another.
5. All the areas of the residence were physically arranged (different areas designated for different activity) so that people with autism had continual visual cues in order to understand what was expected from them.
6. Strong work rules such as "first work and then play". Each activity was designed to positively reinforce the residents.
7. Structured activities. All the activities in the residence were structured even if they had to do with work, personal care, outdoor activities or meal times.

Participants

There were 10 participants in the study, seven men and three women. All of them were diagnosed according to Childhood Autism Rating Scale (CARS) (Mesibov²⁶), with pervasive developmental disorder-Autism. They were also diagnosed according the DSM-IV criteria (American Psychiatric Association²⁷).

The range of age was from 16 to 30 and the mean age was 21.3. All participants had mild to severe intellectual disabilities. None of them had previously experienced the TEACCH method. They had lived in the parental home or in psychiatric hospitals before moving to this residence.

Materials

A frequency check-sheet was designed to summarize the frequency of certain challenging behaviours over a month for Time I, II and III, which were available at the ABC record of each participant (Emerson,⁷ Desrochers,²⁸ Martin²⁹). These challenging behaviours were categorised in six clusters of behaviours:

1. Self-stimulation (repetitive and ritualistic movements repeated in a six second period or a continuous more complex ritual. Partial or single movements, which are with the range of normal body movements like stretching neck, are ignored).
2. Self-injury (any activity which directly harms the person doing it e.g. head banging, eye poking etc).
3. Aggression to others (any activity which directly harms another person, e.g. kicking, hitting, pushing, pinching etc).
4. Damage to property (any activity which directly damages, overturns or disarranges property e.g. throws crockery, cutlery, smashes window, tips over chair, dropping food, etc).
5. Inappropriate vocalisation (includes swearing, verbal threats, shouting, growling, roaring, screaming, talking loudly, laughing, hysterically, etc).
6. Other (any other inappropriate behaviour e.g. public masturbation, stripping, spitting, touching faeces, interrupting by touch, etc).

Procedure

The researchers summarized the frequency of challenging behaviours according to the ABC records for each participant at a separate sheet for Time I, II and III (Carr³⁰). Then challenging behaviours were categorised to the six different clusters presented above.

Ethical issues

In order to begin and conduct the current study an ethics application was done at the Greek Society for the Protection of Autistic People and to the Institute of Psychiatry London Ethics Committee. Both gave permission to conduct the study. The basic rights to privacy respect were followed and all personal information of participants is confidential. The staff and the parents of participants were informed about the study.

Results

The data formed in six clusters of challenging behaviours. Table 1 shows the mean and standard deviation of the six clusters of challenging behaviours Time I (beginning of the programme in the residence), Time II (12 months after the beginning of the programme) and Time III (18 months after the beginning of the programme). Moreover, a cluster called "overall cluster" was formed and represents the overall frequency of the challenging behaviour clusters for each Time (I, II, & III) (table 1).

Results on changes over time on clusters of challenging behaviour and overall cluster: The data were analysed using Friedman chi-square test, which is analogous to one-way within-subjects ANOVA for ranks used small samples. Unlike the most commonly used alpha level of $P < 0.05$, the current study trying to have the most accurate results, an alpha level of $P < 0.01$ was used. The data analysis indicated that the frequency of challenging behaviours varied across the three Times of measurement. The only cluster that did not have significant decline was the "self-injury" cluster ($\chi^2=2$, $df=2$, $P=0.368$). All other clusters presented significant decline on the frequency of challenging behaviours across the three measurements. For "self-stimulation" cluster $\chi^2=9.579$, $df=2$, $P=0.008$. For "aggression to others" cluster $\chi^2=18.541$, $df=2$, $P < 0.0005$. "Damage to property" cluster presented significant difference $\chi^2=9.579$, $df=2$, $P=0.008$. Also the cluster "inappropriate vocalisation" and the cluster "Other" presented significant decline respectively $\chi^2=19$, $df=2$, $P < 0.0005$ and $\chi^2=15.368$, $df=2$, $P < 0.0005$. The "Overall" cluster had also significant difference and decline of challenging behaviours from Time I to Time II and Time III of measurement ($\chi^2=19.538$, $df=2$, $P < 0.0005$), that is also observable in figure 1.

Discussion

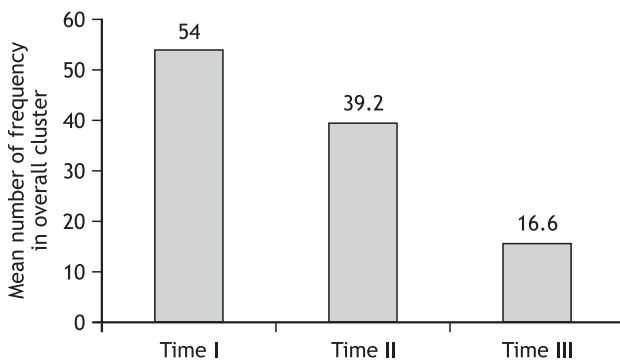
The current study tried to investigate if and how a training programme in a residential setting based on structured teaching and TEACCH principles can be beneficial for people with autism. The aim of the study was to investigate if challenging behaviours can be reduced in adults and adolescents with autism who follow this programme for first time and

Table 1. Mean number and standard deviation of frequency of challenging behaviours in each cluster and overall cluster in Time I, Time II and Time III.

CLUSTERS	Mean number			Standard Deviation		
	Time I	Time II	Time III	Time I	Time II	Time III
Self stimulation	7.1	6	4	7.8	6.6	4.8
Self injury	4.4	7.3	3.3	7.6	5.7	3.1
Aggression to others	16	10.3	3.7	9	6	3.7
Damage to property	4.6	3.1	0.8	5.5	3.7	1.1
Inappropriate Behaviour	11.1	6.9	2.4	4.7	4.6	1.5
Other	10.8	5.6	2.4	3.4	4.1	2.4
Overall Cluster	54	39.2	16.6	15.7	17.2	10.6

N=10 in each condition

Time I: beginning of the programme, Time II: after 12 months, Time III: after 18 months

**Figure 1.** Changes over time of mean number of frequency in the "overall" cluster of challenging behaviours.

have not previously received any kind of intervention. The results of the study showed that the training programme was beneficial and helpful for the residents. The ten participants of the study had significant difference in the frequency of challenging behaviours between Time I, Time II and Time III. The frequency of challenging behaviours in the six clusters (table 1, figure 1), presents a decline. The only cluster that presented insignificance was the cluster that gathered the self-injurious behaviour frequencies. Actually by looking the mean scores for Time I, II and III in this cluster (table 1) it is notable that there is an increase of self-injurious behaviours in Time II. However, there is a rapid decline of self-injurious behaviours in Time III. According to the re-

sults of the study generally the training programme in the residence helped the participants to decline the incidences of challenging behaviours, for the results that showed insignificance it should be reminded that the investigators in order to have as much accurate results as possible in the analysis of the data chose to use a strict alpha level of $P < 0.01$ and not the usual alpha level of $P < 0.05$. In addition the current study had limitations that probably affected the results.

Limitations of the study

There were some limitations in the study, which probably intercepted it presenting stronger evidence for the effectiveness of the programme:

1. The study had limited time to be organised and conducted. Probably with more time available more detailed measurements could be done.
2. The study was only based in the personal functional assessment records of the participants. If the researchers were able to use a different measurement there would probably had stronger results.
3. It also was difficult to find a matched control group. If a bigger sample was available and a control group to compare, the outcomes would probably be stronger.
4. The training of staff-team on the TEACCH principles. The effectiveness of TEACCH is based on the level the philosophy of the programme is understood

by the staff-team and the parents. In order to be in position to say TEACCH principles are used, the staff-team needs to have an official training by the division TEACCH of the University of North Carolina or from an official TEACCH trainer. At the residence the staff team followed training on the TEACCH method before the beginning of the programme and later with in service training by not official TEACCH trainers or authority, but from professionals who had long experience on the use of TEACCH method (Schopler, Mesibov, & Hearsey, 1995).

Even so, the current study presented very useful implications and gave valuable information.

Implications of the study's findings

One question that came up at the current study was whether the progress of the participants was because of the program's effectiveness or because of progress that people with autism can show over time. Challenging behaviours in most of cases increase during childhood and when the person reaches thirty years of age typically declines according to Oliver.¹⁸ However, as was stressed earlier according to the limited evidence available, challenging behaviours develop in early childhood and are persistent over time (Emerson⁷). Also according to Beadle-Brown³¹ the improvement over time is more notable in children than in adults. This supports the opinion that structured teaching and the TEACCH approach programme used in the residence had had a positive effect to the participants because although the residents were not children but adolescents or adults, there is a notable decline in the frequency of challenging behaviours. This is important because the participants were people with autism who never had in past any kind of training or intervention; they had passed their life either in general psychiatry institutions or at home without receiving any kind of structured teaching. This possibly was a success of the training programme. For the first time the participants of the study followed a programme based on TEACCH and structured teaching which probably helped to exploit skills for many years in-

active and drove them dependent to others for very simple daily activities causing frequently challenging behaviours. All the residents presented a good degree of decline in challenging behaviours confirming Mesibov's²⁴ opinion of that just deinstitutionalisation and normalisation principles are not enough in helping people with developmental disabilities. According to Oliver¹⁸ 28% of a total population study of 616 people with intellectual disabilities and self-injurious behaviours in the United Kingdom were leaving at residential settings. The development of residences does not guarantee an elimination of behavioural problems for people with autism. The programme used in the residence had positive effects because it was based on prevention of challenging behaviours by adaptation of the environment to functioning and information processing difficulties of the residents. By eliminating distracting physical environment, using work schedules and clear visual information the programme reduced factors that may be the cause of challenging behaviours (Watson,³² Watson³³).

Conclusions

Today there is not much information available presenting the effectiveness or not of an educational programme for people with autism. Even more rare is the information on the effectiveness of an intervention on challenging behaviours expressed by people with intellectual disabilities and autism. The available studies investigate the effectiveness of TEACCH mostly in children with autism at school settings and for challenging behaviours the only available information is from case studies of people with autism. The current study was a small research in adults and adolescents with autism that had never received any kind of training in past. The results, even if they had limitations such as small period of time and lack of a control group, showed that the programme was beneficial for adults and adolescents with autism. It also gave valuable information for the use of educational programmes adapted to the personal needs of every person in residential settings and gave information for future development of residential programmes of this kind in Greece.

Προκλητικές συμπεριφορές ενηλίκων με αυτισμό: Η αποδοτικότητα ενός προγράμματος βασισμένου στις αρχές της μεθόδου TEACCH και της δομημένης διδασκαλίας σε στέγη προστατευμένης διαβίωσης και εκπαίδευσης

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Σκοπός της εργασίας είναι η διερεύνηση της αποτελεσματικότητας ενός εκ των πρώτων δομημένων εκπαιδευτικών προγραμμάτων που βασίζεται στις αρχές της μεθόδου TEACCH (Θεραπεία και εκπαίδευση παιδιών που πάσχουν από αυτισμό και συναφείς διαταραχές επικοινωνίας). Το εκπαιδευτικό πρόγραμμα αναπτύχθηκε στην Ελλάδα, από την Ελληνική Εταιρεία Προστασίας Αυτιστικών Ατόμων και απευθύνεται σε εσωτερικούς εφήβους και ενήλικες που πάσχουν από αυτισμό. Διερευνήθηκε η αποτελεσματικότητα του προγράμματος στη μείωση της συχνότητας των σοβαρών διαταραχών συμπεριφοράς σε 10 εσωτερικούς πάσχοντες που δεν είχαν λάβει ποτέ κάποια θεραπεία και δεν είχαν παρακολουθήσει κάποιο άλλο εκπαιδευτικό πρόγραμμα. Για το σκοπό αυτό αναλύθηκαν τα δεδομένα της λειτουργικής αξιολόγησης (ABC) των συμμετεχόντων ενώ καταγράφηκε και αναλύθηκε η συχνότητα των διαταραχών συμπεριφοράς σε τρεις διαφορετικές περιόδους κατά τη διάρκεια του εκπαιδευτικού προγράμματος (στην αρχή, μετά από 12 και μετά από 18 μήνες). Τα αποτελέσματα έδειξαν σημαντική μείωση της συχνότητας των διαταραχών συμπεριφοράς σε σχέση με την αρχή του εκπαιδευτικού προγράμματος. Συζητείται η αξία των αποτελεσμάτων για την περαιτέρω έρευνα και ανάπτυξη υπηρεσιών στην Ελλάδα από την Ελληνική Εταιρεία για την προστασία των ατόμων που πάσχουν από αυτισμό.

Λέξεις ευρητηρίου: Αυτισμός στην Ελλάδα, προκλητικές συμπεριφορές, στέγη, TEACCH, δομημένη διδασκαλία, ενήλικες με αυτισμό, .

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