THE CONSUMPTION OF VIRTUAL ENVIRONMENT MORE THAN 4 HOURS/DAY, IN THE CHILDREN BETWEEN 0-3 YEARS OLD, CAN CAUSE A SYNDROME SIMILAR WITH THE AUTISM SPECTRUM DISORDER

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Abstract: This survey describes the incidence of the excessive consumption of virtual environment in children recently diagnosed with ASD, between 2012-2017, in two specialized rehabilitation centres. The survey was conducted longitudinally, following the progress in the therapeutic process, by measuring QD/IQ in 62 children with autism, in Romania. The analysis compared two groups who presented or not a consumption of more than 4 hours/day of virtual environment in their anamnesis history, between 0-3 years old. The results of the survey are the following: children diagnosed with ASD who had an anamnesis history of excessive consumption of virtual environment, between 0 – 3 years old have recorded QD/IQ higher by 37%, between the first and the second complex psychological evaluation, while resources used were three times lower compared to the control group. This suggests that sensory-motor and socio-affective deprivation caused by the consumption of more than 4 hours/day of virtual environment can activate behaviours and elements similar to those found in children diagnosed with ASD. Follwing our survey, we defined this form of autism: Virtual Autism.

Keywords: virtual autism, virtual environment, TV, ASD, screen-time.

Introduction

Seven years ago, some psychologists in Romania observed, in the case of recently diagnosed with ASD, who started a recovery programme, a very different pace of recovery. Specifically, patients had dramatic improvments, compared to previous cases, in all development areas, with the start of recovery protocol.

Looking more in detail their anamnesis history, we have identified a common point of these children who recovered more quickly. It is about a minimum average consumption of 4-5 hours/day virtual environment[1], between 0-3 years old. An interesting aspect is the fact that some of these children have been integrated in the mainstream education system, functionally, without needing special expert help; generally, they presented only problems related to understanding, correct expression and complex expression of the human emotions and relationships. Specifically, understanding abstract things, hints, sarcasm and generally sign language used much by people during communication. After recovery, these children are very much alike the people with Aspeger disorder type. We defined this form of autism: Virtual autism[2].

In Romania, virtual environment consumption rate is very high, largerly due to the political and economical framework. According to a survey named*Une année de télévision dans le monde* achieved by the French Institute Médiamétrie and published in 2013[3], in 2012, Romania occupied the first place among the European countries, as regarding the TV programmes consumption;

[1]*Virtual environment* is represented by any electronic device with a screen and which has an attraction and interest in children: mobile phone, tablet, TV, computer, laptop, etc.

[2]*Virtual autism*is a term used in present paper, referring to disorder of children's functionality and development, due to the excessive consumption of virtual environment in the first years of life, that is similar to the autistic disorder, meets the diagnosis criteria described in special manuals DSM IV, as well as ICD 10. The main difference between the two types of disorder is the direct relation between the autism diagnosis and the consumption of virtual environment, as a trigger

[3]https://www.challenges.fr/high-tech/les-pays-les-plus-frappes-par-la-crise-regardent-plus-la-television_11372 (site accessedon January 24, 2018).

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Romanians' average time of looking TV is about 5 hours and 30 minutes, daily. Other statistics showed that first tablets emerged in 2010, as well as the first mobile phone with Android system, at prices that provide the access to these new technologies to a growing number of people. Since 2012, these technologies have arrived in Romania, at affordable prices; this is also the year of introducing 4G technology which provides unlimited access to Internet, for mobile phones[4]. Unfortunately, these new technologies which can be accessed in any place, beside TV, laptop and computer, come gradually to take over in many families the roles of parents, nanny,babysitter, and thus occupying much time of children's time, without realizing their long term effects.

In recent years, several studies[5] warn about the danger of using virtual environment, for children between 0-5 years old, both from point of view of their physical and mental development.

Despite the renewed recommendations issued by the American Academy of Pediatrics (AAP)[6], that Tv and mass-media use should be discouraged totally before 2 years old, the early exposure to TV increased dramatically in the last decade. More than 90% of infants and young

[4]http://solutiipc.ro/topul-celor-mai-interesante-telefoane-4g/ (site accessedon January 24, 2018)

[5]We refer to the follwing special studies: 1)Council on Communications and Media, Brown A , et al. *Media use by children younger than 2 years.* Pediatrie .2011 ; 128 (5): 1040-1045 pmid: 22007002;http://pediatrics.aappublications.org/content/early/2011/10/12/peds.2011-17532) Kabali HK, Irigoyen MM, Nunez-Davis R, et al. *Exposure and use of mobile devices by young children.*Pediatrics. 2015;136 (6): 1044–1050pmid:26527548; https://www.ncbi.nlm.nih.gov/pubmed/2652754833) Barr R , Danziger C , Hilliard M , et al . *Amount, content and context of infant media exposure: A parental questionnaire and diary analysis.*. 2010 ; 18 (2): 107 - 122pmid: 20890405 http://pediatrics.aappublications.org/content/131/2/e390; 4) Rideout VJ , Hamel E . *Media family: Electronic media in child's life, small children, preschoolers and their parents.* Menlo Park, CA : Kaiser Family Foundation, 2006;https://kaiserfamilyfoundation.files.wordpress.com/2013/01/7500.pdf ; 5) Mendelsohn AL , Berkule SB , Tomopoulos S , et al . *Infant television and video exposure associated with limited parent-child verbal interactions in low socioeconomic status households*. Arch Pediatr Adolesc Med . 2008 ; 162(5): 411 - 417 pmid: 18458186; https://www.ncbi.nlm.nih.gov/pubmed/1845818666) Zimmerman FJ,Christakis DA , Meltzoff AN . *Television and DVD/video viewing in children younger than 2 years*. Arch Pediatr Adolesc Med . 2007. 161 (5): 473 - 479 pmid: 17485624;https://www.ncbi.nlm.nih.gov/pubmed/1748562477) Miller SA , Taveras EM , Rifas-Shiman SL , et al . *Association between television viewing and poor diet quality in young children.* Int J Pediatr Obes . 2008 ; 3 (3): 168-176 pmid: 19086298;https://www.ncbi.nlm.nih.gov/pubmed/1908629888) Tomopoulos S , Dreyer BP , Berkule S , et al . *Infant media exposure and toddler development*. Arch Pediatr Adolesc Med . 2010 ; 164 (12): 1105-1111 pmid: 2113533; https://www.ncbi.nlm.nih.gov/pubmed/1619969399) Zimmerman FJ , Christakis DA . *Children's television viewing and cognitive outcomes: a longitudinal analysis of national data.*. Arch Pediatr Adolesc Med . 2005 ; 159 (7): 619 - 625 pmid: 15996993; https://www.ncbi.nlm.nih.gov/pubmed/15996993 10) Hoyos Cillero I , Jago R . *Systematic review of correlates of screen-viewing among young children.* Prev Med . 2010 ; 51 (1): 3 - 10 pmid: 20417227; https://www.ncbi.nlm.nih.gov/pubmed/20417227 11) Taveras EM, Hohman KH, Price S, et al . *Televisions in the Bedrooms of Racial/Ethnic Minority Children: How Did They Get There and How. Do We Get Them Out?* Clin pediatru (Phila) . 2009 ; 48 (7): 715 - 719 pmid: 19420181 ; https://www.ncbi.nlm.nih.gov/pubmed/1942018112) Certain LK , Kahn RS . *Prevalence, correlates, and trajectory of television viewing among infants and toddlers.* Pediatrie .2002 ; 109 (4): 634-642 pmid: 11927708; https://www.ncbi.nlm.nih.gov/pubmed/1192770813) Conners NA , Tripathi SP , Clubb R , et al. *Maternal characteristics associated with television viewing habits of low-income preschool children.*Journal of Child and Family Studies. 2007 ; 16 (3): 415-425; https://link.springer.com/article/10.1007/s10826-006-9095-014) Vandewater EA , Rideout VJ , Wartella EA , et al. *Digital childhood: electronic media and technology use among infants, toddlers, and preschoolers.* Pediatrie . 2007 ; 119 (5): e1006 - e1015pmid: 17473074; http://pediatrics.aappublications.org/content/119/5/e1006?download=true15) Elizabeth M. Cespedes , Matthew W. Gillman, et al. *Television viewing, bedroom television, and sleep duration from infancy to mid-childhood.*PediatrieMai 2014, VOLUM 133 / ISSUE 5; http://pediatrics.aappublications.org/content/133/5/e116316) Saelens BE , Sallis JF , Nader PR , et al . *Home environmental influences on children's television watching from early to middle childhood.* J Dev Behav Pediatru . 2002 ; 23 (3):127-132 pmid: 12055494; https://www.ncbi.nlm.nih.gov/pubmed/1205549417) Thompson DA , Christakis DA. *The association between television viewing and irregular sleep schedules among children less than 3 years of age.* Pediatrie . 2005 ; 116 (4): 851 - 856 pmid: 16199693 https://www.ncbi.nlm.nih.gov/pubmed/16199693

[6]American Academy of Pediatrics, Council on communications and media, *Media and Young Minds*, Pediatrics, October 2016 http://pediatrics.aappublications.org/content/early/2016/10/19/peds.2016-2591..info

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children worldwide are regularly exposed to electronic media. Though children daily interact with these virtual devices, they have difficulties to overcome the symbolic source and transfer learning in real life[7].

Objectives

- Identify the percentage of recently diagnosed children with ASD who present in their anamnesis history an excessive consumption[8] of virtual environment, in the first three years of life, recorded in our institutions[9], between 2012-2017;
- Identify the percentage of therapy time resources, as well as the therpeutic resources, between the first and the second complex psychological evaluation, compared in two groups of children with ASD, who have experienced and excessive consumption of virtual environment, in the first three years of life;
- Identify the percentage of resources, therapy hours and therapeutic results, compared in two groups of children with ASD, who have experienced or not an excessive consumption of virtual environment, in the first three years of life, on subjects integrated in the mainstream education system, without professional help, at independent, adaptative and functional level.

Hypotheses

- Is there any connection between increased incidence of children with ASD, with anamnesis history of excessive consumption of virtual environment and increased incidence of ASD, in general?
- Can the excessive consumption of virtual environment between 0-3 years old cause a delay in children's psychomotor development and a clinical syndrome similar to autism spectrum disorder?

Methods

Participants

The data resulted from the analysis of the children diagnosed with ASD , evaluated and surveyed longitudinally between 2007-2017, in the recovery centres for children with autism of the *Asociația pentru Sănătate Mintală a Copilului (ASMC)* and *Fundatia Copii în Dificultate – România (CID- România)*. We mention that both organizations provide services , both in the centres and at home. The analysed group included 110 children from the country (23,21%) and towns (76,97%). The incidence on sexes is the following: 1) 76,36% - boys; 2) 23,64% - girls. At the initial assessments, the minimum age of total subjects group was between 12 and 122 months, with an average of 39 months.

Design and implementation

Since in Romania, the recovery services for children with autism are not reimbursed by Government, parents pay almost all of these costs. Therefore, after initial assessment, only 54, 55 of the benefitiaries' representatives have requested professional care services. Of the total number of benefitiaries, 84,26% had home services, while 15,38% were in the above mentioned centres.

[7]1) Barr R,*Memory Constraints on Infant Learning From Picture Books, Television, and Touchscreens* 2013;7(4):205–210; http://onlinelibrary.wiley.com/doi/10.1111/cdep.12041/abstract ;2) Barr R.*Transfer of learning between 2D and 3D sources during infancy: Informing theory and practice*. Dev Rev. 2010 Jun 1; 30(2): 128–154. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2885850/

[8]In the present paper, *excessive consumption*,in the children case, represents a 4-5 hours/day average consumption of the virtual environment, between 0-3 years old.

[9]Asociația pentru Sănătate Mintală a Copilului (ASMC) and Fundația Copii în Dificultate – România (CID-România).

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Home services included: 1) initial and periodical complex psychological assessment; 2) training,preparation customized intervention plan, both initilally and periodically; 3) training and coordination for the team who applies the therapeutic protocol; 4) periodical monitor.

Services in special centres included initial and/or periodical recovery psychological assessments for children with autism.

Analyses were conducted between the development coefficiencies (QD) recorded at the first complex psychological evaluation, compared to the second psychological evaluation. There were taken into consideration both general coefficients and coefficients on the three worst affected areas for children diagnosed with ASD. It is about the social area, the area of language and cognition area. The time distance between the two evaluations varied between 2 and 10 months, and it was settled by the case manager, depending on child's response at the therapeutic protocol.

In order to achieve the targets, subjects were distributed, as following:

- A group called „Control group", including subjects diagnosed with ASD, who did not present in the anamnesis history consumption of virtual environment or the consumption represented an average of 2 hours/ day;
- A group called "Screen group", including subjects diagnosed with ASD , who presented in the anamnesis history an excessive consumption of virtual environment, between 0-3 years old.

On these two groups, there were analysed both general data and those referring to the differences between resources and results and between the first and the second complex psychological evaluation.

- A group called „Integrated children group" included both subjects from *Control group* and *Screen group*.

This group included children diagnosed with ASD who presented significant improvements, up to the level of integration into the mainstream education system, without professional help, being independent and functional, even if alongside, in parallel some of them continue special therapy, to improve certain areas and /or poor behaviours. In order to be included in this group, subjects should receive a QD/IQ higher than 90 at the assessment with WISC IV[10] or Portage Scale and a Scor T < 59 at the assessment with ASRS[11].

After applying the selection criteria for the survey, the two groups were composed, as follwing: 1) *Control group* - 29 subjects; 2) *Screen group* - 33 subjects.

Since 2012, until 2017, we analysed the data related to the incidence of the excessive consumption of virtual environment in the first three years of life, on the group including all the children recently diagnosed with ASD in the two institutions, in total number of 110 subjects.

One of the variables we were not able to maintain constant, for the total groups was the first assessmentaverage age. This happened due to the increasing media of the autism phenomenon and the existence of multiple information on the Internet. Thus, parents observed children's behaviours, at younger ages than ever and communicated this aspect to specialist doctors. In the recent five years (2012-2017), the diagnosis age decreased dramatically. If ten years ago, in Romania, children were diagnosed, generally, after 36 months old, in present, children are diagnosed even at 12 months old, the average being around 22-24 months old.

Thee average age of the *Control group* was 42 months, up to nine months older than *Screen group*, which was 33 months old. In order to verify if this variable may influence the final data, we selected from both groups five subjects presenting the same age at the moment of first evaluation, and compared the differences between the two groups, related to the first and second assessment.

The minimum duration of therapy applied to subjects between the first and the second complex psychological assessment was of 36 hours/month, and the maximum duration of 88 hours/month, with an avearge of 40,39 hours/month.

[10]Wechsler Intelligence Scale for Children - fourth edition
[11] Autism Spectrum Rating Scales

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Selection criteria and final statistical data

In order to calculate the incidence of number of children diagnosed with ASD who present in the anamnesis history an excessive consumption of virtual environment, in the first years of life, we used the total group including 110 children recenlty diagnosed with ASD , evaluated in the programmes provided by the two special centres, between 2012-2017.

The criteria for the other objectives were the following:

- Subjects diagnosed with ASD, aged 12-68 months, at the initial assessment;
- Parents were notified about the content of the specific therapeutic protocol provided through our services and they agreed to be applied;
- The recovery therapeutic protocol was continuing and included at least 2 complex psychological assessments;
- In the case of children presenting in their anamnesis history virtual environment consumption, parents agreed to remove this variable, in order to optimize the therapeutic protocol results.

The recovery therapeutic protocol

It was designed within the *Asociaţia pentru Sănătate Mintală a Copilului (ASMC)*, as a special protocol based on the combination of various therapies specific to the children with ASD, and adapted to every subject psycho-motric-sensitive needs of each subject, and developed in a working system 1/1, excepting the stages of generalization and socialization.

The protocol includes specific elements from the following therapies: sensitive integration therapy, play therapy, occupation therapy, language stimulation and logopedy, psychomotor stimulation therapy, cognition behaviour therapies, behaviour analysis and experiential orientation techniques and methods. In order to optimize the therapeutic process, a systemic approach is applied, by involving parents, extended family and other relevant people who take care of children**.** The therapeutic protocol aims also to increase pacient's level of functionality and approaches multisiciplinary the development and distribution of concentrated attention, memory, level of thinking, processing speed, vizo motor and vizo spatial processing, as well as increased independence and self-esteem.

The protocol was applied to all the subjects, being adapted to every patient, according to the specific particularities revelead by the complex psychological assessments, both initially and periodically.

The methodology for calculating of differences between resources and outcomes in the two groups

Since theprogramme of applying the therapeutic protocolcould not be implementedas standard to all subjects, as there were different variables[12]between the two groups, in order to make comparative analyses, as objective as possible, we created the following calculation methodology and indices:

- The variable „*resources*" includes the number of therapy hours/month and duration expressed in months. On the two groups, we achieved an average of therapy duration and number of hours, between the two moments of assessments (first, second and final ones, etc);
- The variable „*outcomes*" includes the percentage difference between the two moments of assessments, it includes the percentage difference between the two moments of assessement, and general QD/IQ, as weel as the three main development areas affected in ASD : socialization, language and cognition.

We settled the following codes and calculation formulas:

- EV1 – initial assessment; EV2 – second assessment;
- QD – coefficient of development;
- LC – Control group; LE – Screen group;

[12]It is about observing a number of therapy hours/day, days/ week, holidays, therapy duration, etc.

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- IRT – therapeutic resources index = average care per hours/month* average number of months/100;
- IET –therapeutic efficiency index = IRT LC/IRT LE ;
- ERT– real therapeutic efficiency = QD EV2 LE/QD EV2 LC * 100 – 100;
- IGE – overall efficiency index = IET * (ERT QD + 100) /100.

Explanations:

- Therapeutic resources index (IRT) represents therapeutic cost between two moments;
- Therapeutic efficiency index (IET) represents the difference between the therapeutic resources index of some different groups or subjects (fewer resources consumed, for a group or another).
- Real therapeutic efficiency(ERT) represents the percentage difference between two development coefficients or number of children integrated from some groups or different subjects (the comparison of the efectivness of results in the two groups).
- The overall efficiency index (IGE) represents and average of the efficiency index (IET) and real therapeutic efficiency (IRT) of some groups or different subjects (the comparison of the efectivness of the therapeutic protocol between groups, in general).

Instruments

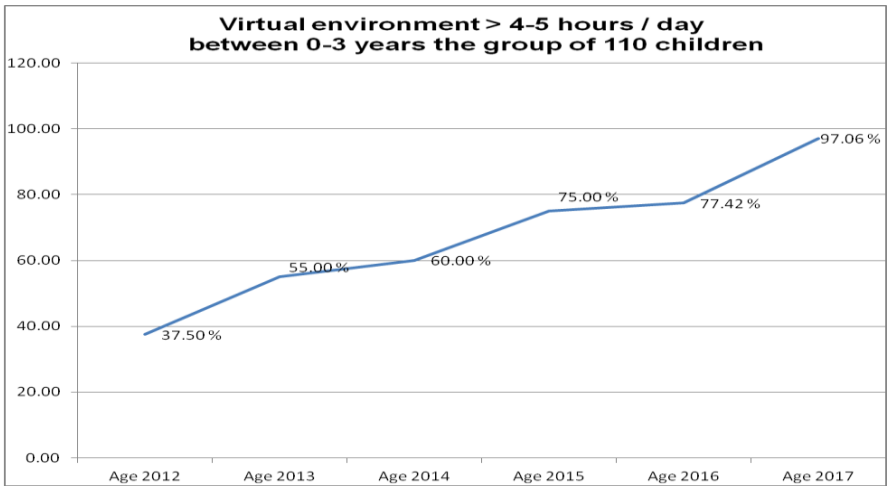
1. The anamnesis interview and questionnaires applied to parents, both initaially and periodically. It represents the most important method of collecting information, as we can find all the pre- and post natal history of children, mother and all people who contributed to children's growth,care and education, the type of parenting and all the existing resources that can contribute to a harmonius development. 60,86, % of the initial and periodical assessements have been achieved at home;
2. Instruments to diagnose autism. When entering our services, 83,88% of the children presented the diagnosis of ASD , at the psychiatrist. Despite of all that, diagostics have been confirmed by the following instruments: for 90% it was applied ASRS, which a standard test in Romanian people with ASD , aged 2 and 18. For the rest of 10 %, there were applied M-CHAT (Modified Checklist for Autism in Toddlers) and CARS (The Childhood Autism Rating Scale). All results have been compared and confirmed with the diagnostic criteria described in the special manual DSM IV. For 93.64%, diagnosis was confirmed, the rest of 6,36% presented elements in autism, however they did not meet all the diagnosis conditions, so they have been recorded with atypical autism.
3. Instruments to diagnose QD or IQ: WISC IV – Wechsler intelligence scale for Children – fourth edition. It is a clinical instrument, applied individually, assessing cognitive ability of children between 6 years old and 0 months and 16 years old and 11 months. The WISC-IV Scale provides composite scores representing intellectual functioning in specific cognitive domains (ex. Speech Understanding Index, Perceptual Reasoning Index, Working Memory Index and Speed processing Index), however it provides a composite index representing children general intellectual ability (ex. Total intelligence Coefficient). It was used the 90% trust interval; Portage Scale – scale for assessing the level of psycho-motric development in children between 0 – 6 years old. This instrument helped us to design personal intervention plans and observe the therapeutic quantitative progress.

Data and findings

In the first stage, we synthetized data on virtual environment consumption, between 2012-2017, on the total group of 110 subjects observed in this time, since we have had standards, in this matter.

The incidence of the excessive use of virtual environment among children diagnosed with ASD throught the entire period 2012-2017 was of 75,45%, namely 83 subjects. The percentage data for each year are showed in the following table:

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The significant increase in the incidence of excessive consumption of virtual environment from 37,5% in 2012, to 97,06%, in 2017 seems to be directly connected with the tablets and Android mobile phones, with affordable prices, in Romania, 2012 being the year of introduction of 4G technnology providing unlimited access to Internet and completing the cunsumption of computer, laptop and TV, through a supplementary access and much easier to any location (car, restaurant, park, etc).

Comparative statistical data between the first and the second psychological assessment

		Control group	Screen group		
Number of children		29	33		
Average age		42 months	33 months		
Therapy months average		4.6	3.2		
Average hours/month		88.76	40.39		
Therapeutic Resources Index (IRT)		4.08	1.29		
Therapeutic Efficiency Index (IET)		3.16		ERT QD	IGE
QD General	Ev 1	58.63	59.00	37.33%	4.34
	Ev 2	65.31	89.69		
QD Socialization	Ev 1	51.81	49.63	43.23%	4.53
	Ev 2	59.56	85.31		
QD Language	Ev 1	28.25	26.63	59.73%	5.05
	Ev 2	39.56	63.19		
QD Cognition	Ev 1	53.00	47.94	50.48%	4.76
	Ev 2	64.88	97.63		

Data show a therapeutic efficiency of 3,16 higher for the*Screen group*, compared to *Control group*. This aspect means that resources (time/therapy hours) between the two assessments were 3.16 lower in *Screen Group*. In spite of all that, the therapeutic progress is higher with percentages between 37,33% in general QD and 59,73% in language QD in *Screen Group*, meaning that the general efficiency index (IGE) show that the therapeutic protocol applied to subjects had an overall efficiency on QD generally higher than 4 times in *Screen Group*, compared to the *Control Group* and even more than five times, in language, between the two assessments.

Compared general statistical data and on the group of *Integrated Children Group*

	Control group		**Screen group**	
	Nr	%	Nr	%

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Total	**29**	-	**33**	-		
Boys	22	75,86	29	87,88		
Minimum age in months	28		12			
Minimum age in months	42		33			
Minimum age in months	68		58			
Under therarapy	22	75.86	14	75.86		
Integrated Children Group	**7**	**24,14**	**19**	**57,58**	**IET**	**ERT**
Minimum IRT	10,56		0.88		*12.00*	
Average IRT	**14,40**		**4,84**		***2,98***	***138,53%***
Maximum IRT	78,00		11,44		*7,39*	

For the *Integrated Children Group*, in the calculation of the average therapeutic resources index,(Average IRT), the average values from all the integrated children were the following: the average for the *Control group* is 58.15 hours/months, duration 24,76 months, and the average in *Screen group* is 44,45 hours/month, duration 11,14 months.

Data show a real therapeutic efficiency (ERT) for the pentru *Integrated Children Groupi*, 138,53% higher than in *Screen group*, compared to *Control Group*. This means that *Screen group* consumed 2,98 less resources, but they recorded 2,39 higher number of integrated children than the *Control group*, resulting an global efficiency index (IGE) 7,12 times higher.

As we mentioned before, one of the variables we could not maintain constant for total groups was the average age, for the first assessment. In order to verify if this aspect can influence the final data, we made the following comparison:

Statistical data between the first and the second assessment
- 10 subjects groupwith average identical age at the first assessment -

		Control group	Screen group		
Average age		34,20 months	34,00 months		
Average therapy months		6,2	3,2		
Average hours/month		88,10	63,84		
Therapeutic Resources Index (IRT)		5,46	2,04		
Therapeutic Efficiency Index (IET)		**2.67**		ERT QD	IGE
QD General	Ev 1	40,60	47,40	65,88	4,44
	Ev 2	51,00	84,60		
QD Socialization	Ev 1	42,20	41,40	60,25	4,28
	Ev 2	48,80	78,20		
QD Language	Ev 1	32,40	29.00	84,08	4,92
	Ev 2	40,20	74,00		
QD Cognition	Ev 1	40,80	48,80	86,53	4,99
	Ev 2	49,00	91.40		

The above mentioned statistic data show that the 9 months difference of age between the *Control group* and *Screen group* total cannot influence the final data, at least until an average age of 34 months, as the differences in the general efficiency index (IGE) between the total group and the group withidentical ages show values under 10%, between 2.12% and maximum 5.72%.

Disscutions

Children, in front of virtual environment are not a part of the experiences of common language, thinking and reflexion stimulation by dialogue which parents, grandparents or family, or human environment generally provide. Auditory and visual stimuli perceived in front of screens are quite aggressive for brains in full development, move so quickly, so they overpass children capacity

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to control them. Invariably, the effect is the significant inhibition of some mental processes or the poor development of neuronal areas. Children get used to the virtual environment and they do not want to understand what is happening in the world around them and they are content only with sensations.

The experience of watching the virtual environment is not a real one, in space and time, distances, but a virtual one, suggested or only encouraged, within the virtual world. Children lack the possibility to learn, by touching and physisical manipulation of materials, one of the conditions governing the process of knowledge and therefore structuring neural pathways. Virtual environment deprive young children of peace and respite necessary to develop the internal language mechanisms of thinking and reflexivity. This does not favour an interactive participation into the proccess of knowledge, on the contrary, it encourages a passive and passivated experience for human mind. By the excessive consumption of virtual environment, children are deprived of the capacity of developing and imagining games and weaknes their mintal dynamism. After prolonged viewing, children tend to maintain the same status of passivity or non-involvment in the knowledge of real wolrd. Experiments on mice subjected on virtual environments showed that those exposed were hyperactive, not aware of danger and showed more liabilities to any new challenge [13].

Following comments captured in this survey,the way of improving children's maladaptive elements that were excessive in the virtual environment in children between 0-3 years old are similar to the case of the Romanian children with the *autist post-institutional syndrome*, after adoption.[14]. The autistic-like or semi-autistic symptoms of the Romanian orphanes is reported for the first time, by Rutter and his co-workers, in two successive studies, published in 1999, and 2001. They identified at the children adopted from the Romanian orphanages – with too high frequency, to be considered a simple coincidence – a group of symptoms meeting mostly those included into the diagnostic criteria of autism pathology, indicated by the DSM-IV. There are mentioned defficiencies in the socio-communicative abilities which determine, at their turn, social integration issues, language and speech issues, self-aggressive and aggressive behaviour, rigid behaviour and obsessive interests (Rutter et al., 1999; Rutter et al., 2001). It is important to mention that behaviour syndrome was described in the special literature, not only for the children who grew up in an institutional environment, but also for the children who grew in an unproper family environment, characterized by the lack of socio-affective stimuli (Shin, 1999). The differences between the simptomatically picture of classic autism and that characteristic to the above mentioned children, determined scholars to be more reluctant, in identifying totally this behaviour syndrome with ASD. Unlike classic autism, for the autistic-like syndrome, the feature is not the self-impossed isolation (though there are important problems in social integration and communication), but the existence of behavioral stereotypes. The unusually deep interests for a certain type of sensation, motor mannierisms, strange and obssesive concerns are those prevailling in the symptoms picture in the behavioral syndrome above mentioned. Moreover, it seems that this semi-autist symptoms tend to improve in the post-adoption time, the age between 4-6 years old being particularly important for future favourable development (Rutter et al., 1999; Zeanah et al., 2003). Despite the above mentioned differences, the existence of this autistic-like symptom in children who grew in a deviant and traumatic environment arise a series of theroretical issues, able to shade the discussion about the role of the epigenetic factors in autist pathology[15].

[13]Dimitri Christakis - *"Understanding Media's Impact on Infants and Toddlers – a Pediatrician's Perspective"*, min.21:22- 23:56https://www.youtube.com/watch?v=HbUtvPfXt24 (site accessedon 26.01.2018)

[14]Hoksbergen R , ter Laak J , Rijk K , et al. *Post-Institutional Autistic Syndrome in Romanian adoptees.*J Autism Dev Disord. 2005 Oct; 35 (5): 615-23.https://www.ncbi.nlm.nih.gov/pubmed/16167089

[15]Muraru O, Zhang S H, Bocian M. *Simptomatologia „autistic-like" a copiilor proveniti din orfelinatele Romanesti – posibile consideratii cu privire la etiopatologia autismului* . Revista Română de Psihiatrie- Asociatia Română de Psihiatrie si Psihoterapie. http://www.romjpsychiat.ro/article/simptomatologia-autistic-like-a-copiilor-proveniti-din-orfelinatele-romanesti-posibile-consideratii-cu-privire-la-etiopatogenia-autismului (site accessed on 25.01.2018)

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All these aspects have been also confirmed by specialists in our centres who interacted with this category of children. This fact leads to conclude that one of the factors which influenced a lot the emergence of the ASD elements described by DSM IV, was represented by the excessive consumption of virtual environment, between 0-3 years old, by senzory-motor and socio-affective deprivation, the first three years representing an essential time, in the brain and neuronal networks development. Between 0-2 years old, brain triples its size and it depends a lot of external stimulation[16]. The maximum density of synapses is reached under a year of birth in brain sensory areas and at 3.5 years in the middle frontal gyrus (Blakemore, 2008). This stage is dominated initially by „expectancy of experiences" mechanisms, and then, by „dependent on experience" mechanisms. This means that the proccess of emerging the synapses is modulated by external experiences in the environment, more exactly by the epigenetic factors[17].

This senzory-motor and socio-affective deprivation[18], in certain circumstances of genetic predisposition (Elise B. Robinson, 2016)[19], can lead, through the action of epigenetic factors, to the structure of a neurological system, similar to those of the children with ASD.

The outcomes of present paper as well as the personal expertise in children with ASD recovery, the differential diagnosis between this new form of autism, called*Virtual Autism* and the „classical" forms of autism can be achieved only by applying two cumulative conditions. It is about eliminating the consumption of virtual environment and start a special recovery programme. According to the patients' response to the recovery protocol, we can distinguish one to another. Present paper show that a global efficiency index is necessary (IGE), minimum four times higher than „classic" cases, in order to distinguish a patient in this form of *Virtual Autism*.

This survey, even if it is not the first to bring into discussion this aspect[20], it is the first clinical survey applied on certain population, achieved in Romania. The first survey to bring about this phenomenon goes back to 2006[21] and it investigated empirically, based on statistic data, the hypothesis that childhood television viewing serves as a trigger in ASD . The survey concluded that autism rates were higher in states like USA, where the level of rainfalls was higher and increased the number of TV cable subscriptions.

In present, specialists in different countries[22] bring about this phenomenon[23], there are campaigns on different web pages[24] and international meetings on this subject have been organized[25].

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[16]Conferinţa TEDxRainier - Dimitri Christakis - *Media and Children*, min.1:22 si 3:53-4:42, https://www.youtube.com/watch?v=BoT7qH_uVNo (site accessed pe 25.01.2018).

[17]Cîrneci Dragoş, 2015, Testarea psihologică II - Psihodiagnoza personalităţii, pag 51. Editura Fundaţiei România de Mâine.

[18]More than 5 hours/day of virtual environment can represent, as quantity, percentages between 50-70% of the wakefulnessof a child between 0-3 years old.

[19] Elise B. Robinson et al, *Genetic risk for autism spectrum disorders and neuropsychiatric variation in the general population*. Nat Genet. 2016 mai; 48 (5): 552-555.https://www.nature.com/articles/ng.3529

[20] Heffler KF , Oestreicher LM . *Causation model of autism: Audiovisual brain specialization in infancy competes with social brain networks.*. Med Ipoteze. 2016 Jun; 91: 114-122. two: 10.1016 / j.mehy.2015.06.019. Epub 2015 27 June. https://www.ncbi.nlm.nih.gov/pubmed/26146132

[21]Michael Waldman, Sean Nicholson, Nodir Adilov, *Does Television Cause Autism?.Johnson School Research Paper Series No. 01-07*. Posted: 30 May 2007; https://papers.ssrn.com/sol3/papers.cfm?abstract_id=989648

[22] Romania, United States of America, France, Qatar

[23]https://www.youtube.com/watch?v=9-eIdSE57Jw(site accessed on 24.01.2018) https://www.youtube.com/watch?v=nXRBv7kvD9s(site accessed on 24.01.2018) https://www.youtube.com/watch?v=x9RdP8W3bK8(site accessed on 24.01.2018) https://www.youtube.com/watch?v=lyAe75uPFCo(site accessed pe 24.01.2018)

[24]http://www.surexpositionecrans.org/qui-sommes-nous/(site accessedon 24.01.2018), http://www.stopautismvirtual.ro(site accessedon 24.01.2018),https://esmautism.wixsite.com/website(site accessedon 24.01.2018)

[25]https://www.youtube.com/watch?v=DbJOBNWj374(site accessed on 24.01.2018)https://www.youtube.com/watch?v=yHoB4aLd4II&list=PLi9jHTk1Lc9urvOGLSNPFZ750jM6TT4vs&index=10(site accessed on 24.01.2018).

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Limitations and restraints

Present paper, although discusses a new phenomenon, it presents certain limitations linked to matters of conscience, as well as ethics and deontology, both personal and professional. This si because the survey show that a differential diagnosis cannot be achieved, unless it eliminates the consumption of virtual environment and starts a special recovery protocol; a complete survey should introduce an alternating random of subjects who eliminate or not the consumption of virtual environment, and/or a group of subjects to start or not a specific recovery protocol.

However, this survey does not represent or intends to be an exhaustive research, and we resume it in an improved version, according to the development of this phenomenon and the emergence of newer special research in the area. Taking into consideration it is a recent phenomenon, similar research should be replicated, in other conditions, especially in other countries, in order to observe if this hypothesis is verified completly.

Conclusions

Different and favourable ways that children between 0- 3 years old, diagnosed with ASD, who presented in their anamnesis history an average consumption over 4 hours/ day of virtual environment, reacted to the therapeutical process, compared to the control group, suggests a direct causal link between this excessive screen consumption and and similar behaviours and elements to those found with ASD. This excessive consumption of virtual environment between 0-3 years old, cumulative with a genetic predisposition can produce even a neuro-cognitive structure typically for the children with ASD, affecting brain structures on the long term, by the influence of the epigenetic factors, caused by sensory-motor and socio-affective deprivation, leading to high incidence of autism, at national and international level, through this new form of autism, called in the present paper *virtual autism.*

Recommendations:

For parents:

- Avoid the use of electronic devices with screens for children younger than 24 months and off devices when not in use, mostly in children rooms;
- Limit the electronic devices within an hour/day and only in the presence of adults, to help children understand what intended, for children between 2 and 3 years old;
- For children between 3 and 6 years old, limit the screens to maximum an hour/day, select high quality programmes and avoid to use them when eating or an hour before sleeping;
- Consult reccomendations of the National Broadcasting Council about the measures to be taken for protecting children in the families, available at the address: http://www.cna.ro/article6548,6548.html.

For specialists – pediatric, family, neuropsychiatric, neurologists, psychologists etc.

- Inform directly parents about the risks of exposure to electronic devices with screen of children and especially children between 0-3 years old;
- Advise parents the maximum amount of use of screen devices, according to children's age;
- Advise parents quality alternative and recreational activities, to physical and mental development, replacing time viewing screens.

For public institutions – Ministry of Health, National Broadcasting Council, Bodies designated for Consummer Protection (ANPC, InfoCons), etc.

- Organizing national education and awarness campaigns about the risks of use of virtual environment (mobile phone, TV, laptop, tablet, computer) on children aged 0-3 years.

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