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Professional Training along Implementation of Programs to Students with Autism Spectrum Disorder

Dr. Manuel Ojea Rúa
Director of Scientific Research Institute (Autism Association)
University of Vigo

Summary
This study analyzes the levels of specific professional training along different sectors that intervene to people with Autism Spectrum Disorder (ASD). A total of 122 participants corresponding to different groups have participated in this research: families, teachers, clinicians, caregivers and others (occupational therapists, social integrators and volunteers).
The general aim is delimiting the basic relational parameters of effective specific training for implementation of programmatic processes in students with ASD. The data has been found throughout ad hoc questionnaire applied to different groups. Results indicate there´re significant relationships between specific training and the type of training, which allows concluding that´s necessary to establish innovative projects they relate the intervention psychosocial and educative to structural training processes, based on needs of implemented intervention, through institutionally supported projects, designed and evaluated regarding own practice.
Key Words: *Autism Spectrum Disorder, Training, Evidence Based Interventions (EBI).*

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I. Introduction

According toCenters for Disease Control and Prevention (2018), 1/59 people have been identified with the specific diagnosis of ASD, agreed to basic criteria indicated by International Classification DSM- 5 (American Psychiatric Association (APA), 2013): I) deficits in interaction and social communication, and II) symptoms of stereotypical and restrictive behaviors, both over different degrees or levels of disorder intensity. From a perceptive- cognitive perspective, these criteria converge with specific particularities regarding information cognitive processing along both perceptual level and information encoding process and posterior recovery, owing difficulties in integrating information with semantic criteria, as well as in development process of links between the previous learning and the new essences. (Ojea&Dapía, 2019).

Currently, most students with ASD participate in ordinary regular general education settings, however, owing the specificities of people with ASD, inclusive educational practices demand specific training in the educational factors involved, regarding, both specialist teachers, and also regular teachers. However, according to research byBertuccio, Runion, Culler, Moeller&Hall (2019),most educators report they have very limited knowledge and training to support students with ASD and affirm they need professional training, which is an essential factor to development of programs adapted to particularities of these students.

Likewise, diverse previous preliminaries highlight the importance of professional training specific of groups that working with people with ASD (Dow &Mehring, 2001; Scheuermann, Webber, Boutot& Goodwin, 2003). For this reason, different investigations focus on deepening over formation type selected for psycho-socio-educational intervention ambit to people with ASD regarding diverse work groups: family, educators, health specialists and social services.Corkum, Bryson, Smith, Giffin, Hume& Power (2014) analyze the training professional needs of sectors that intervene to students with ASD regarding provide the effective adapted programmatic way in regular educational environment, as well as the training process that teachers carry out. Their conclusions refer that training is generally based on development of punctual courses or workshops, but there aren´t formal training projects based on the applied practice data and it´s highlighted how educators think coordination with families or other teachers as effective potential factors to implemented process and intrinsically ease the professional capacitation.

Morrier, Hess &Heflin (2011) investigate the professional training of educators teaching students with ASD(N= 90) and authors conclude that basic training was received through online methodology. Likewise, most common method indicated of training was based on one-day assistance to specific workshop, <15% of teachers reported training at university centers, but most significantly, there´re not support evidence-based studies, concluding, in summary, the individual educational factors related to training were not significant for the

development of efficient educational practices applied to students with ASD, both context of specialist teachers, such as regular teachers.

Odom, Cox, Brock & National Professional Development Center on ASD (2013) encourage the use of regular data-based practices at school for students with ASD, based on previous knowledge provided by National Center for Professional Development in ASD(NPDC), which included the principles of scientific knowledge on evidence-based practices, as well as carried out evaluation processes on practices implemented based on development of professional competences skills of study participants. The positive evaluation of these innovations points the future of specific educational intervention, which must be supported on training plans structured, but training processes must be based over implementation of own practice, previously design to specific needs of students with TEA, as well as evaluate the program effectivity implemented and the planned training quality.

National Autism Center (2009) analizes national projects to facilitate training processes for teachers, family members, healthcare professionals and social organizations to implement out effective practices with people with ASD. Phase 1 (2009) examined and quantified the level of research supporting interventions that aim to basic characteristics of people with ASD. Phase 2 (2015) provides an update of scientific literature on psychosocial- educational interventions for students with ASD under age of 22 and includes studies evaluating interventions implement with adults with ASD (over 22 years). The main aim of current phase 3 (2018) is provide up-to-date information on interventions have been shown effectivity for people with ASD throughout life, which final publication scheduled for 2021.

II. Research Aims

This study respond to following general aims: 1) analyze the individual perception of training specific level the different groups that teaching to people with ASD (families, teachers, clinicians, caregivers and other groups (occupational therapists, social integrators and volunteers), 2) delimit the different types of training carried out by the educative intervention groups to students with ASD, 3) analyze the correlations of study variables, focused especially with specific formation, 4) deduce the hypotheses explicative that influence to individual consideration of specific training of different groups surveyed, and 5) analyze if there´re significant differences in whole analysis process regarding consideration made by the different participating groups.

III. Method

Participants

A total of 122 participants have answered the questions in this study. Participants are part of factors caring for people with ASD, both family, teaching professional, clinical specialists, personal care and others, formed by occupational therapists, social integrators or volunteers.

Design

This research is based on design of an ad hoc questionnaire (link:https://docs.google.com/forms/d/1Ll3TEw6JfQujbU0OVKd_cGYoqUOjSX1iQtVjEkbrKM4/edit) distributed through the drive operating system. Resultant data were analyzed throughout SPSS statistical system.

Variables

Variables selected of this questionnaire has been named and valued according indicated in Table 1.Variable "training" has been considered as dependent variable (VD) of study.

Table 1: Name and values of variables.

name	*content*	*values*
I. "training"	Individual perception of own training.	0: very low 1: low 2 half 3: high 4: very high
II. "group"	Participants' membership group.	0: family 1: teacher 2: clinical 3: caregivers 4: others
III. "age"	Age of participants surveyed.	0:20-30 years 1:31-40 years 2:41-50 years 3:>51 years
IV. "sex"	Sex of participants surveyed.	0: men 1: women
V. "experience"	Professional experience.	0: 1-5 years

		1: 6-10 years 2: 11-15 years 3: 16-20 years 4:> 21 years old
VI. "institutional"	Support institutional over specific training processes.	0: very low 1: low 2 half 3: high 4: very high
VII. "coordination"	Coordination degree between different factors involved along process.	0: very low 1: low 2 half 3: high 4: very high
VIII. Type	Training type.	0: autonomous (books, journals ...) 1: punctual courses from various organizations. 2: university master's degree. 3: formation on-line. 4: formation based on data with coordinated support: seminars, projects (...)

Procedure

After analyzing the reliability of questionnaire items, it was distributed through the drive platform to all health, social and educative centers, as well as families and carers for people with ASD. Upon, a total of 122 questionnaires were received from different geographical areas from Galicia Community (Spain).

Data analysis

Finally, data analysis was performed through SPSS´ statistic following: 1) contingency table: participants according group type by sex by age, 2) contingency table according training perception by group type by training type, 3) Univariate ANOVA for DV: "training", 4) Correlations inter-variables, focused over DV, and 5) differential analysis regarding group type (Tukey´ post-hoc analysis).

IV. Results

Study participants: frequencies

A total of 122 participants are divided into 4 groups: 1) family group of peoples with ASD (n = 29), 2) teachers group: regular and specialist teachers (n = 48), 3) clinical group, formed by doctors-psychiatrists or specific paediatric services (n = 18), 4) caregivers group (n = 17), and 5) others, make up by occupational therapists, social integrators and volunteers (n = 10). Participants group were analyzed according age and sex variables (see Table 2).

Table2: Participants distribution(N= 122): group type/ age/ sex.

sex			age				Total
			20-30 years	31-40 years	41-50 years	>51 years	20-30 years
men	group	family	0	2	0	0	2
		teacher	1	4	1	0	6
		clinical	0	0	0	1	1
		caregivers	0	2	0	0	2
		others	0	2	0	2	4
	Total		1	10	1	3	15
women	group	family	0	6	15	6	27
		teacher	0	29	3	10	42
		clinical	0	6	2	9	17
		caregivers	0	13	1	1	15
		Others *	1	1	4	0	6
	Total		1	55	25	26	107

*__Others__: occupational therapist, social integrators and volunteers.

As can be seen, for a total 122 participants, it found 29 family members (23.8%), 48 teachers (39.3%), 18 clinical staff (14.8%), 17 caregivers (13.9%) and 10 others (8.2%) participated. Likewise, most participants belong to female sex (n = 107, 87.7%), while only 15 belong to male group (12.2%).

Training perception

According data, training level of participants group according their own perception can see Table 3.

Table 3: training level.

		"training"					
		very low	low	half	high	very high	Total
group	family	0	0	16	10	3	29
	teacher	2	7	9	22	8	48
	clinical	0	1	4	10	3	18
	caregivers	1	2	1	12	1	17
	others	0	3	4	3	0	10
Total		3	13	34	57	15	122

According indicated data, families group (n = 29) indicates a level half training (16, 55.1%), high (10, 34.4%) and very high (3, 10.3%). The teachers group (n = 48) show a high training (22, 45.8%), half (9, 18.7%), very high (8, 16.6%), low (7, 14.5%) and very low (2, 4.1%). Clinical specialist group (n = 18) report about high training (10, 55.5%), half (4, 22.2%) and very high (3, 7.3%). Caregivers group (n = 17) show specific high-level training (12, 70.5%), low in 2 cases (11.7%). Finally, others´ group (10) indicate a half training (4, 40%), low (3, 30%) and high (3, 30%).

In general, for N = 122, the specific training answered by study participants corresponds to high level training (57, 46.7%), half (34, 27.8%), very high in 15 cases (12.2%), low in 13 (10.6%) and very low in 3 (2.4%).

Training type

Regarding to variable "type", was analyzed through contingency table of group type and training degree, results whose can see in Table 4.

Table 4: training type.

training	group	training type				
		autonomous	specific courses	university masters	on-line	data-based
very low	teacher	1	1			
	caregiver	0	1			
	Total	1	2			
low	teacher	0	6		1	
	clinical	0	1		0	
	caregiver	0	1		1	
	others	1	1		1	
	Total	1	9		3	
half	family	6	5	0	5	0
	teacher	0	6	2	0	1
	clinical	0	3	0	1	0
	caregiver	0	1	0	0	0
	others	0	2	0	2	0
	Total	6	17	2	8	1
high	family		5	4	0	1
	teacher		5	13	0	4
	clinical		4	4	2	0
	caregiver		3	8	1	0
	others		3	0	0	0
	Total		20	29	3	5
very high	family	0	0	1		2
	teacher	0	0	2		6
	clinical	1	1	0		1
	caregiver	0	0	1		0
	Total	1	1	4		9

In summary, it concludes the highest levels of training are considered by training types data-based training (very high: 9, high: 5), being teachers giving best consideration this formation methodology (n = 11); secondly, there´s training based on university master's degrees (very high: 4, high: 29), also carried out mostly by teachers group (n = 17); and, finally, the training based on punctual courses: very high: 1, high: 20.

Lowest consideration observed over formation quality is related to training type carried out autonomously and online systems.

Correlations inter-variables

Bivariate relationships between study variables were analyzed by correlations statistic of variables, focused into variable "training" (see Table 5).

Table 5: Correlations analysis.

		group	age	sex	Expe-rience	Institu-tional	training	Coordi-nation	type
group	Pearson Correlation	1	-.10	-.17	-.11	.03	-.07	-.08	-.04
	Sig. (2-tailed)		.24	.05	.22	.68	.40	.35	.60
age	Pearson Correlation		1	.11	.65(**)	.10	.40(**)	-.18(*)	,13(*)
	Sig. (2-tailed)			.19	.00	.25	.00	.04	.04
sex	Pearson Correlation			1	.06	-.01	,19(*)	-.11	.09
	Sig. (2-tailed)				.49	.91	.02	.19	.31
experience	Pearson Correlation				1	.19(*)	.39(**)	-.30(**)	.08
	Sig. (2-tailed)					.02	.00	.00	.36
institutional	Pearson Correlation					1	.17	.16	.04
	Sig. (2-tailed)						.05	.07	.63
training	Pearson Correlation						1	.09	.40(**)
	Sig. (2-tailed)							.30	.00
coordination	Pearson Correlation							1	.02
	Sig. (2-tailed)								.83
type	Pearson Correlation								1
	Sig. (2-tailed)								

** Correlation is significant at the .01 level (2-tailed).

* Correlation is significant at the .05 level (2-tailed).

Focusing this study over variable "training", it can be seen that "training" correlates significantly with following variables: “age” (*r*=.40, sig.= .00), “sex” (*r*= .19, sig.= .02), “experience” (*r*= .39, sig.= .00) and “institutional” (*r*= .17, sig.= .05) y “type” (*r*= .40, sig.= .00), while no significant correlations are observed with variables:“group” (*r*= -.07, sig.= .40) and “coordination” (*r*= .090, sig.= .30).

Explicative hypotheses of "training" variable

In this section, univariate ANOVA analysis is carried out for study factorials variables: "experience", "institutional", "coordination" and "type"), considering "training" variable as dependent variable (DV) to observe if variable: "training" is influenced by others variables indicated (see table 6).

Table6: Tests of Between-Subjects Effects.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	96.51(a)	76	1.27	7.53	.00
Intercept	302.71	1	302.71	1796.29	.00
type	11.16	4	2.79	16.55	.00
experience	8.93	4	2.23	13.25	.00
institutional	1.45	4	.36	2.15	.08
coordination	6.95	4	1.73	10.32	.00
type * experience	.50	8	.06	.37	.92
type * institutional	1.46	8	.18	1.08	.39
experience * institutional	1.48	4	.37	2.20	.08
type * experience * institutional	.00	0			
type * coordination	.76	4	.19	1.14	.35
experience * coordination	.00	1	.00	.00	1.00
type * experience * coordination	.00	0			
institutional * coordination	2.71	1	2.71	16.13	.00
type * institutional * coordination	.00	0			
experience * institutional* coordination	.00	0			
Type* experience * institutional * coordination	.00	0			
Error	7.58	45	.16		
Total	902.00	122			
Corrected Total	104.09	121			

a) R Squared = .927 (Adjusted R Squared = .84).

As observed, factors studied are highly explicative regarding variance of "training" variable (corrected R^2= 80.4%). Analysis show a significant factorial intersection level (Sig. = .00). Individual factors indicate important and decisive influence on "training" variable: "type" (Sig. = .00), "experience" (Sig. = .00) and "coordination" (Sig. = .00); however, isolated "institutional" variable doesn´t indicates a significant influence (Sig. = .08), although does exercises it in interaction with "coordination" (Sig. = .00), although there´re significant levels when "institutional" variable interacts with other factors.

Differential analysis

Post-hoc analysis for "group" variable allows see if there´re differences between participants group type regarding to "training" variable (see Table 7).).

Table7: Differential analysis by group.

(I) grupo	(J) grupo	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Upper Bound	Lower Bound
family	teacher	-.01	.08	1.00	-.24	.22
	clinical	-.28	.10	.07	-.58	.01
	caregiver	-.03	.10	.99	-.34	.26
	others	.55(*)	.12	.00	.18	.91
teacher	family	.01	.08	1.00	-.22	.24
	clinical	-.27	.09	.05	-.54	.00
	caregiver	-.02	.09	.99	-.30	.25
	others	.56(*)	.12	.00	.21	.91
clinical	family	.28	.10	.07	-.01	.58
	teacher	.27	.09	.05	-.00	.54
	caregiver	.24	.11	.24	-.09	.58
	others	.83(*)	.13	.00	.43	1.22
caregiver	family	.03	.10	.99	-.26	.34
	teacher	.02	.09	.99	-.25	.30
	clinical	-.24	.11	.24	-.58	.09
	others	.58(*)	.13	.00	.18	.98
others	family	-.55(*)	.12	.00	-.91	-.18
	teacher	-.56(*)	.12	.00	-.91	-.21
	clinical	-.83(*)	.13	.00	-1.22	-.43
	caregiver	-.58(*)	.13	.00	-.98	-.18

Based on observed means.

* The mean difference is significant at the .05 level.

As observe, there aren´t significant differences between the participant groups regarding whole study: family, teacher, clinical and caregiver; however, there´re significant differences with "others" group, made up of occupational therapists, social integrators and volunteers regarding other participant´ groups.

V. Conclusions

Regarding data of this research, following fundamental conclusions can be deduced:

1. Sectors that work directly with people with ASD present a half or half-high level of specific training for intervention of students with specific needs related. Likewise, this individual think regarding own professional training is independent of group type surveyed, excluding the caregivers group, who significantly differ from teachers group and clinical.
2. Training type answered with higher-level training corresponds to data-based training with institutional structural support, followed by university master's degrees. This higher- level training relates mostly to study teachers group.
3. Professional training is very directly related whole study variables, regardless of group type. In this sense, it´d be noted that no significant correlation levels are observed with the variable "coordination" between professionals, which allows conclude that coordination between factors in isolation isn´t sufficient assure specific training and must be accompanied by mediated processes of specialists throughout set implemented process data-based.
4. In general, answers found throughout this study are independent of group type surveyed, except the "others" group (occupational therapists, social integrators or volunteers), that differ from the others groups of study regarding their specific training consideration to people ASD.

Upon, effective specialized training to intervention of people with ASD must continue a structural process based on following development phases:

1) Initial assessment of particular needs, both individual and contextual.

2) Design corresponding programmatic process according initial analysis.
3) Specify coordination mechanisms of sectors that´ll be involved along this programmatic development.
4) Plan specific training process related programmatic implementation.
5) Analyze and reflect over data resulting from assessment.
6) Propose and design necessary changes regarding data analysis.
7) Final evaluation of project effectivity.

In synthesis, this structural process can see in Figure 1.

Figure 1:Training process.

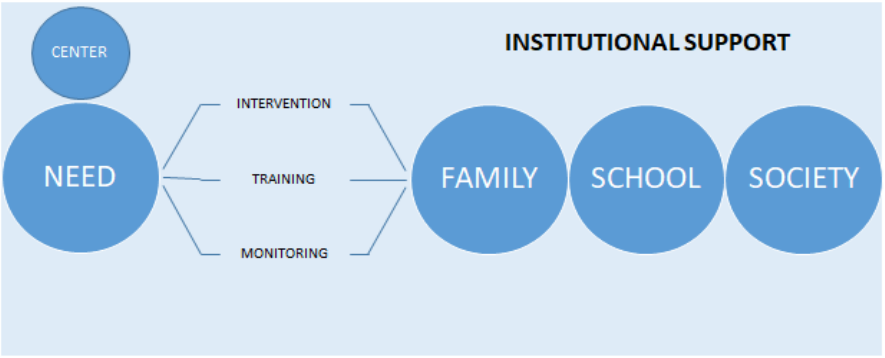

Figure shows training specific development must associates with own practice, adapted to particular needs of people with ASD. This practice will be progressively evaluated and improved, according data of empirical practice. But, these goals need support of structural institutional programs, both public and private, along whole process, including specific professional training.

VI. Discussion

Indeed, many reviews currently focus on identifying data evidence-based practices(NAC, 2009; Reichow & Volkmar, 2010; Siegel & Beaulieu, 2012; Wong et al., 2013). In this sense, much research focusing over data-based practices with people with ASD. Alexander, Ayres & Smith(2015) include 23 studies evaluating teacher training for students with ADS. Authors syntethized qualitative information about study and characteristics of training participants. Results suggest that research focused most over individual training of teachers and use of concrete and isolated interventions.Paynter et al. (2017) show intervention practices in people with ASD are effective, but most practices aren´t supported by global socio-community processes designed institutionally. As well, authors investigate early intervention contexts (N = 72) different specific ways of specific professional training and conclude most of them are based the use of individual strategies, from unspecialized diverse sources of documentation.

Hsiao &Sorensen (2019) study 25 practices data-based supported on professional training of teachers.On study, authors indicate that 40% of specialist teachers didn´t receive specific training support mediated along practice or was very limited, as well as use of news technologies over practice was practically nothing, e.g., video modelling importance was bit along learning process of students with ASD, while 20% training practices were based on service's own regular process, but specific training didn´t adapt to individual-contextual specific needs.

Hoover (2013) studies professional training carried out throughout application of Evidence Based Interventions (EBI) plan and concludes there´s important correlation between specific professional training and found results of EBI when professional training is integrated throughout practice and regarding to data-evidence.

Indeed, practices based on psycho- social- educational programs development for ASD students, supported data- evidence regarding assessed needs, make up best didactic method to specific training when it´s structured over intervention context set. Odom, Collet-Klingenberg, Rogers& Hatton (2010) identify 24 intervention practices data-based from own practical experience:Evidence- Based Practices (EBP)and authors identify 24 intervention practices based on their own practical experience from Evidence-Based Practices (EBP) programs and conclude that specific professional training is critical to specific intervention programs adapted in regular contexts. EBP practices are conceptually combined with own professional experience through programmatic implementation according to specific needs ongoing assessed.

Although these researchers are few, innovative experiences the institutional level carried out develop widely satisfactory results. Indeed, Maddox &Marvin (2013) show research study carried out with children under 18 months at state level from university sector tries leading a response to assessed needs of people with ASD about an evidence-based paradigm. General aim was encouraging specific professional training of whole sectors of the practice- based intervention: educators, family members and other psicho- social and clinical sectors.

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