

Analysis of Anxiety Values In Persons With Autism Spectrum Disorder Upon Confinement State Owing to Virus Covid-19

Abstract

People with Autism Spectrum Disorder (ASD) are characterized by particular needs related to area of social communication and evident limitations in interests and restricted and repetitive behaviors. Owing isolation state by COVID-19 infection in Spain, it can involve changes in daily structural routines of people with ASD, which can produce a high in anxiety levels personal and familiar. For this reason, this research aim is analyze whether anxiety levels have increased in people with ASD affected of this special situation. A total of 168 participants conformed study, developed through questionnaire. Results, found through parametric analysis, shows significant changes for anxiety variable in people with ASD. These changes are significant on corrected model and its intersection (Sig=.00). Likewise, protocol program has been proposed to avoid increasing indicated anxiety levels.

Keywords: Autism Spectrum Disorder; COVID-19; Anxiety

Introduction

People with Autism Spectrum Disorder (ASD) are characterized by particular needs related to the area of social communication and evident limitations in interests and restricted and repetitive behaviors, which, sometimes, aren't functional, with certainly rigid and highly structural behaviors, with difficulties in adapting to behavioral processes of change. Likewise, diagnosis configuration is integrated of sensory perceptual processes, specifically related to hypo and hypersensitivity or sensory inputs that can limit the patterns and abilities of daily life (*American Psychiatric Association (APA), (2013) [1]. Schulz and Stevenson (2019)[16]*) confirm the presence of limitations related to hypersensitivity and repetitive behaviors in people with ASD and carry out an investigation to prove the presence of relationships between sensory behaviors and their sub domains of repetitive, stereotyped behaviors and highly structured and authors conclude those behaviors increase, in effect, with sensory hypersensitivity, especially in the visual, auditory, oral and tactile modalities, with hypersensitivity being highly predictive of repetitive and restrictive behaviors in all its sub domains: motor movements, rigidity, adherence to routines, concern for restricted patterns, and unusual sensory interests. Likewise, although, these relationships can also occur in normo-typic groups, it occurs with higher intensity index in people with

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ASD specific diagnosis, owing to the particularities of perceptual-cognitive functioning in relation to stimulate input, encoding and retrieval of information (*Baum, et al., (2015) [5]; Bishop, et al., (2006) [6]; Lidstone, et al., (2014) [11]*). However, people with ASD show high variability, both phenotypic and genotypic shapes, showing different specific adaptive levels, which are dependent on many concurrent situations and the presence of high diagnostic comorbidity, which establishes important differences between different groups of people with ASD in relationship with the domains and subdomains of diagnostic areas (*An, et al., (2016) [4]; Lai, et al., (2014) [10]; Miles et al., (2011) [13]; Rubenstein et al., (2019) [7]*). *Epstein et al. (2017) [2]*) perform a study, precisely, to identify the different diagnostic domains related to the quality of life of people with ASD. In their results, they conclude the quality of life of people with ASD are highly influenced by connections and relationships of these people with social community and environment in which they participate. Thus, these two components become priority factors of personal and social quality of life along development of people with ASD. But, in addition, within their findings, they also show, as (*Murphy et al. (2017) [14]*), that settlement and predictable planning of daily life routines in development natural environment become fundamental variable elements regarding improvement of life quality. In their studies, likewise, authors conclude the different functional and structural domains, related to physical health, the development of emotional processes and adaptive behaviors are basic elements that complete the main components of life quality of people with ASD, what's also specified by (*World Health Organization (WHO) (2001)[19]*). In this sense, e.g., the increase in anxiety, motivated by increase in levels of personal frustration, the loss of routines or predictable anticipated behaviors, can cause important non-adaptive behaviors, which induce intense stereotyped behaviors, self-injurious processes or the increase of sensoriality in different sensitive modalities, which can cause sleep or feeding problems and their corresponding feedback (*Goldstein, 2002 [8]; Sytsma et al., 2001[17]*). In summary, a healthy life for people with ASD, agreed to criteria indicated by OMS, ob cit., is related to quality and frequency of previously planned social interactions,

which's independent of acquired verbal or social skills. (Epstein et al. (2016)[2]) show the existence of routines linked to different domains of activities and its participation, as well as, the planning of outdoor community routines related to environmental factors, have been observed as basic factors of development. Although, indeed, some children with ASD prefer to be alone temporally to relax or pursue their own interests, nevertheless, most children with ASD desire social connections and relationships in which can feel involved, understood and included over your interactive activity processes. (South, et al., (2007)[12]) examine precisely this relationship between repetitive behaviors in people with ASD and performance on neuropsychological tests of executive function and conclude, indeed, the intensity and frequency of stereotyped, restrictive and repetitive behaviors are positively correlated with cognitive rigidity processes for adaptability of people with ASD to changes over environment. (Hughes (2001) [9]) affirm these conclusions are fundamental to understand the interaction between the structural rigidity of behavior and the increase of generalized anxiety processes in people with ASD, explained by central cognitive coherence hypothesis, likewise, executive dysfunction hypotheses. Well, this study analyzes the psycho-affective consequences, specified in the anxiety values when breaking previous routines and predictable behaviors in people with ASD, as consequence of confinement, derived from COVID-19 infection. Likewise, action protocols developed, it'll allow observing if these proposals influenced in positive interaction of values found in the variable participants' anxiety.

Research Aims

This research study tries to answer the following general aims:

1. Analyze the anxiety levels in people with ASD as consequence of the confinement state, derived from actions of the alarm state for control of coronavirus COVID-19.
2. Check if general protocol measures influenced the anxiety levels of participants.
3. Analyze if there're differences regarding the diagnosis type, age and sex of study participants to develop differentiated action protocols, if necessary.

Method

Design

Study is based on experimental design, throughout use of an ad hoc questionnaire.

Participants

A total of 168 participants on Spain participated in this study, of which 40 are women and 128 men. Regarding the diagnosis way, 74 are children with ASD of level 1, 46 with ASD level 2, 36 have ASD level 3 and 12 others (atypical generalized disorder) (see Table 1).

| Sex | | | Years | | | | | Total |
|--------------|------------|--------|-----------|-----------|-----------|-----------|-----------|------------|
| | | | 07-Apr | 11-Aug | 15-Dec | 16-19 | >19 | |
| Woman | Diagnostic | ASD 1 | 0 | 4 | 7 | 0 | 1 | 12 |
| | | ASD 2 | 9 | 0 | 3 | 1 | 3 | 16 |
| | | ASD 3 | 0 | 3 | 0 | 2 | 4 | 9 |
| | | Others | 1 | 0 | 0 | 1 | 1 | 3 |
| Total | | | 10 | 7 | 10 | 4 | 9 | 40 |
| Man | Diagnostic | ASD 1 | 18 | 7 | 30 | 6 | 1 | 62 |
| | | ASD 2 | 14 | 1 | 2 | 2 | 11 | 30 |
| | | ASD 3 | 13 | 1 | 4 | 2 | 7 | 27 |
| | | Others | 0 | 2 | 1 | 4 | 2 | 9 |
| Total | | | 45 | 11 | 37 | 14 | 21 | 128 |
| TOTAL | | | | | | | | 168 |

Variables

Along study, 8 variables were operationalized, of which the anxiety variable was considered as dependent variable (DV) and the others variables used as explicative or comparative factors (IV) for analysis (see Table 2).

| Nome | Content | Value |
|---------------------|--|---|
| Diagnostic | Participants diagnosis. | 0-ASD 1. 1-ASD 2. 2-ASD 3. 3- Others (Atypical Generalized Disorder). |
| Age | Participants age. | 0-4 to 7 years. 1-8 to 11 years. 2-12 to 15 years. 3-16 to 19 years. 4->19 years. |
| Sex | Participants sex. | 0-woman. 1-man. |
| Anxiety(DV) | Participants anxiety. | 0-very low. |
| Routines(IV) | Planning new daily routines. | 1-low. |
| Physical(IV) | Planned physical activity. | 2-half. |
| Social(IV) | Complementary planned social support activities. | 3-high. |
| Academic(IV) | Complementary planned academic support activities. | 4-very high. |
| Exits(IV) | Temporary departures regarding with the State of Alarm Decree for people with ASD. | |

Table 2: Variables

Procedure

Once the ad hoc questionnaire was designed, which is composed of answers of quantitative continuous scale, it was distributed over online platform Drive to families of peoples with ASD in Spain. Data found were analysed through SPSS statistic pack.

Results

Anxiety levels

Indeed, as data acquired from the means comparative test for a sample, data over anxiety variable indicate significant changes

owing isolation state and breaking of routines along social-personal confinement (see Table 3).

| | Test value = 0 | | | | |
|---------|----------------|-----|-----------------|-----------------|-------------------------|
| | t | df | Sig. (2-tailed) | Mean Difference | 95% Confidence interval |
| Anxiety | 20.09 | 167 | .00 | 2.01 | Lower |
| | | | | | Upper |
| | | | | | 1.81 |
| | | | | | 2.21 |

Table 3: One-Sample Test.

Likewise, changes characteristics can be seen in Table 4, in which the half levels (frequency: 41, percent: 24.4%) or high levels: frequency: 51, percent: 30.4%.

| | | Frequency | Percent | Valid % | Cumulative % |
|--------|-----------|-----------|---------|---------|--------------|
| Valid: | very low | 32 | 19,0 | 19,0 | 19,0 |
| | low | 24 | 14,3 | 14,3 | 33,3 |
| | half | 41 | 24,4 | 24,4 | 57,7 |
| | high | 51 | 30,4 | 30,4 | 88,1 |
| | very high | 20 | 11,9 | 11,9 | 100,0 |

Table 4: anxiety values (N= 168).

Explicative components of anxiety variable:

Table 5 shows the factorial components of those variables that most influence anxiety levels in descending order.

| | |
|-----------------|--------------|
| Routines | 0.895 |
| Physical | 0.758 |
| Exits | 0.693 |
| Social | 0.414 |
| Academic | 0.391 |

Extraction method: Principal Component Analysis (Components= 1)

Table 5: Component Matrix(a,b).

As observe, the component matrix includes 3 fundamental explicative factors of variance found in anxiety variable: routines (89.5%), physical (75.8%) and exits (69.3%). Thus, these 3 variables will be assumed for subsequent univariate analysis to specify the explicative incidence level of factors on changes found in anxiety variable (Table 6).

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|--------------------|-------------------------|----|-------------|---------|------|
| Corrected Model | 264.11(a) | 99 | 2.66 | 9.63 | 0 |
| Intercept | 381.78 | 1 | 381.78 | 1378.48 | 0 |
| Routines | 1.29 | 3 | 0.43 | 1.55 | 0.2 |
| Physical | 9.47 | 4 | 2.36 | 8.55 | 0 |
| Exits | 11.5 | 4 | 2.87 | 10.38 | 0 |
| Diagnostic | 0.18 | 2 | 0.09 | 0.32 | 0.72 |
| Sex | 0.45 | 1 | 0.45 | 1.64 | 0.2 |
| Age | 21.8 | 4 | 5.45 | 19.67 | 0 |
| (...) | - | - | - | - | - |
| Exits * diagnostic | 1.5 | 1 | 1.5 | 5.41 | 0.02 |

DV: Anxiety

Table 6: Test of Between-Subjects Effects for anxiety. a) R Squared = .933 (Adjusted R Squared = .837).

Indeed, R squared adjusted explicative degree for the whole study is very high: 83.7% to specify changes found over anxiety variable. These changes are significant on corrected model and its intersection (Sig=0.00). Likewise, the factors considered individually show differences, while physical (Sig=0.00), exits (Sig=0.00) and age (Sig=0.00) variables show significant critical levels, other variables don't find significant levels. Also, inter-variable interactions found significant interaction between exits and diagnostic (Sig=0.02). Possibly, the routines variable isn't reflected on Between-Subjects Effectsowing families have tried develop the action protocol structurally.

Comparative Analysis

Throughout this study has can observed there're interactions with significant critical levels, then it's important analyse if there're differences regarding participant groups for anxiety variable, as well as observe the comparative levels to variance factors, according diagnostic way, age and sex of participants. This analysis was carried out through post-hoc analysis (Tukey HSD test) for diagnostic and age variables; and the t-test for 2 independent samples for sex variable.

Table 7 shows data referring to diagnostic variable.

| (I) diagnostic | (J) diagnostic | Mean Difference (I-J) | Error | Sig. | 95% Confidence | |
|----------------|----------------|-----------------------|-------|------|----------------|-------|
| | | | | | Upper | Lower |
| ASD 1 | ASD 2 | -.70(*) | 0.09 | 0 | -0.96 | -0.44 |
| | ASD 3 | -.62(*) | 0.1 | 0 | -0.91 | -0.34 |
| | others | -.96(*) | 0.16 | 0 | -1.39 | -0.53 |
| ASD 2 | ASD 1 | .70(*) | 0.09 | 0 | 0.44 | 0.96 |
| | ASD 3 | 0.07 | 0.11 | 0.91 | -0.23 | 0.38 |
| | others | -0.25 | 0.17 | 0.43 | -0.7 | 0.19 |
| ASD 3 | ASD 1 | .62(*) | 0.1 | 0 | 0.34 | 0.91 |
| | ASD 2 | -0.07 | 0.11 | 0.91 | -0.38 | 0.23 |
| | others | -0.33 | 0.17 | 0.23 | -0.79 | 0.12 |
| Others | ASD 1 | .96(*) | 0.16 | 0 | 0.53 | 1.39 |
| | ASD 2 | 0.25 | 0.17 | 0.43 | -0.19 | 0.7 |
| | ASD 3 | 0.33 | 0.17 | 0.23 | -0.12 | 0.79 |

Table 7: comparative analysis for diagnostic variable.

Based on observed means.

*The mean difference is significant at .05 level.

Indeed, data indicates the participants with ASD 1 differ significantly from participants with diagnostic of ASD 2 (Sig=0.00), ASD 3 (Sig=0.00) and others (Sig=0.00). Moreover, there're no significant comparative differences regarding diagnostic type: ASD 2, ASD 3 and others. (Table 8) shows there're significant differences between the age group: 4-7 years regarding to group 12-15 years and group: > 19 years.

Likewise, it also shows differentiated data between the age group 8-11 years in relation with group 12-15 years and the group > 19 years. Age group of 16-19 years just differs from age group > 19 years. It's remarkable highlight the age group over 19 years differs significantly from all others age groups. There're also important differences in the 4-7 age group, which differs from all groups, but from 8-11 age group.

| (I) age | (J) age | Mean difference (I-J) | Error | Sig. | 95% Confidence | |
|-------------|---------|-----------------------|-------|------|----------------|-------|
| | | | | | Upper | Lower |
| 4-7 years | 11-Aug | -0.13 | 0.14 | 0.89 | -0.53 | 0.27 |
| | 15-Dec | .44(*) | 0.1 | 0 | 0.14 | 0.73 |
| | 16-19 | 0.25 | 0.14 | 0.37 | -0.14 | 0.65 |
| | >19 | -.66(*) | 0.11 | 0 | -0.99 | -0.32 |
| 8-11 years | 07-Apr | 0.13 | 0.14 | 0.89 | -0.27 | 0.53 |
| | 15-Dec | .57(*) | 0.14 | 0 | 0.16 | 0.97 |
| | 16-19 | 0.38 | 0.17 | 0.18 | -0.1 | 0.88 |
| | >19 | -.53(*) | 0.15 | 0.01 | -0.97 | -0.09 |
| 12-15 years | 07-Apr | -.44(*) | 0.1 | 0 | -0.73 | -0.14 |
| | 11-Aug | -.57(*) | 0.14 | 0 | -0.97 | -0.16 |
| | 16-19 | -0.18 | 0.14 | 0.72 | -0.59 | 0.22 |
| | >19 | -1.10(*) | 0.12 | 0 | -1.44 | -0.75 |
| 16-19 years | 07-Apr | -0.25 | 0.14 | 0.37 | -0.65 | 0.14 |
| | 11-Aug | -0.38 | 0.17 | 0.18 | -0.88 | 0.1 |
| | 15-Dec | 0.18 | 0.14 | 0.72 | -0.22 | 0.59 |
| | >19 | -.92(*) | 0.15 | 0 | -1.36 | -0.48 |
| >19 years | 07-Apr | .66(*) | 0.11 | 0 | 0.32 | 0.99 |
| | 11-Aug | .53(*) | 0.15 | 0.01 | 0.09 | 0.97 |
| | 15-Dec | 1.10(*) | 0.12 | 0 | 0.75 | 1.44 |
| | 16-19 | .92(*) | 0.15 | 0 | 0.48 | 1.36 |

Table 8: comparative analysis for age variable.

Based on observed means

*The mean difference is significant at 0.05 level.

Finally, comparative analysis t for 2 independent samples regarding sex variable (see table 9), shows sex variable, for significant Levene's statistic (F=4.62, Sig =0.03), which assumes people variances different, allows conclude the associated value t=0.98, df= 81.02, Sig. (2- tailed)=0.32, which concludes there're no differences on level changes for anxiety variable according participant's sex. However, there're comparative differences of sex variable on 2 explicative variance factors with variance not equal assumed: academic factor (Sig. = .00) and social factor (Sig =0.00)

| | | Levene's | | t-test for equality of means | | | | | | |
|----------|--------------------|----------|------|------------------------------|-------|------|------------|-------|----------------|-------|
| | | F | Sig. | t | df | Sig. | Mean Diff. | Error | 95% Confidence | |
| | | | | | | | | | Upper | Lower |
| Anxiety | Equal variances | 4.62 | 0.03 | 0.87 | 166 | 0.38 | 0.2 | 0.23 | -0.25 | 0.67 |
| | No equal variances | | | 0.98 | 81.02 | 0.32 | 0.2 | 0.2 | -0.21 | 0.62 |
| Routines | Equal variances | 4.15 | 0.04 | -0.08 | 0.66 | 0.92 | -0.01 | 0.19 | -0.39 | 0.36 |
| | No equal variances | | | -0.09 | 76.37 | 0.92 | -0.01 | 0.17 | -0.36 | 0.33 |
| Physical | Equal variances | 5.87 | 0.01 | 1.25 | 66 | 0.21 | 0.28 | 0.23 | -0.16 | 0.74 |
| | No equal variances | | | 1.4 | 80.07 | 0.16 | 0.28 | 0.2 | -0.11 | 0.69 |
| Academic | Equal variances | 5.4 | 0.02 | 2.4 | 66 | 0.01 | 0.61 | 0.25 | 0.11 | 1.12 |
| | No equal variances | | | 2.71 | 81.44 | 0 | 0.61 | 0.22 | 0.16 | 1.07 |
| Social | Equal variances | 4.96 | 0.02 | 2.13 | 0.66 | 0.03 | 0.55 | 0.25 | 0.04 | 1.06 |
| | No equal variances | | | 2.3 | 74.67 | 0.02 | 0.55 | 0.23 | 0.07 | 1.03 |
| Exits | Equal variances | 0.01 | 0.9 | -0.5 | 16 | 0.61 | -0.14 | 0.28 | -0.69 | 0.41 |
| | No equal variances | | | -0.49 | 64.25 | 0.62 | -0.14 | 0.28 | -0.7 | 0.42 |

Table 9: Comparative analysis for sex variable.

Conclusions

People with ASD have significantly increased anxiety levels owing to confinement process derived from COVID-19 infection. Likewise, it's worth noting there're differences over whole process for different diagnostic groups (ASD level), as well as, age and sex of participants. However, different research studies show how daily interactions carried out between family members and people with ASD produce general positive effects, both along overall development of these people and in emotional process of their families. Otherwise, it's established negative interactions that affect to development of child with ASD and the depressive process of their families. Positive interaction helps to ease the effects of unexpected and unpredictable behavior caused by isolation state (Pruitt, et al., 2016 [20]). Therefore, it's necessary family members self-schedule their own breaks, since care and continuous attention throughout 24 hours, without the support of school nor other specific services, can cause an increase in anxiety levels in its members, who, successively, reproduce negative implications to people with ASD. These breaks could be carried out along activities the children can do alone, through establish of support schedule between the family different members and, if possible, through of specific occupational caregivers help. For this reason, anxiety increase on peoples with ASD of this research study has been partially reduced owing protocol carried out by family and the specific social resources. This action protocol has been based a set of emotional, social and academic support aids and the possibility to do leisure temporal outings for people with disorders, approved by government Instruction of March 19, 2020 for confinement state: (Ojea (2020)[15]), proposes specific measures during the alarm state for people with ASD, regarding the development of previously planned routines, as well as, the on-line support of specific services:

New situation understanding

Facilitate the understanding of new situation, meaning and the basic concepts related to COVID-19 infection, consequences and hygiene measures (personal hygiene, contacts isolation, face protectors, ...) through a structure of stories or vignettes accompanied by images visuals or videos role- playing, adapted to comprehensive specific needs of each individual. It's necessary assure they have right understood the proposed meaning and, if required, persist on this explanation to suitably its understanding.

Develop a structured schedule of daily routines:

This structural process of new routines should be agreed, if possible, with people with ASD, based on previously acquired skills, e.g:

Morning-Wakeup: Breakfast, toilet, brush your teeth, get dressed;
-School homework: virtual classroom-videoconference with teachers or classmates, other school activities, for which, it can leave the backpack ready beforehand.

Rest: Free fine/gross motor skills, a short walk on street or

outdoors.

Food: Personal cleaning activity, preparing meal with your help, if possible, - eating (if foods child was used are lacking, previously an inventory of favourite foods carry out).

Afternoon: Social networks, talk to friends through chats, via mobile, computer; - Rest: free fine/gross motor skills, walking outside; -Free time without screens: reading, writing, expressive drawing, crafts, games without screens; - Free time with screens (computer, tablet, mobile, television): video games, specific programs.

Night: - Dinner: cleaning activity, prepare dinner with your help, if necessary, have dinner; - Interactive free game based on communication between different family members; - Preparation of night routine action: -toilet activity; bedtime preparation (don't use screen games at least an hour before bedtime).

All activities must be accompanied by a highly visual, clear and justly, anticipated schedule, complemented with drawings made by the child himself, or with representative images of each activity. These images must be placed along different areas where each activity will be carried out, which, if possible, it'd correspond to different spaces the house for each planned activity, avoiding the it be same physical space: school activities, free time activities, food, sleep. Persistence with patience over pre-established schedule and its agreement through showy visual strategies for each situation, as well as, the use of immediate positive reinforcements on activity development will become a best aspect to side this new situation.

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