

The effect of the home environment on children with autism spectrum disorder

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Abstract

The estimated prevalence of autism spectrum disorders (ASD) is 1% worldwide. Autistic individuals typically have a high level of sensitivity to the various environmental stimuli (smell, noise, light). These stimuli have a positive or negative influence on the person–environment interaction, and an excess of stimuli may create inappropriate or unanticipated behavioral responses (such as a crisis) effecting their well-being. The Model of Competence, which provides an explanation of the interaction between the individual and the environment, was selected as the conceptual framework to direct this study. The purpose of this study is to investigate the opinions and experiences of mothers regarding the influence of the characteristics of the home environment on autistic individuals. A qualitative interpretative description design was utilized for this study's framework. Participants in the study were mothers who have autistic children. The study with focus groups was continued until data saturation was reached. There was a thematic investigation carried out. The findings show that the factors that have an effect on autistic individuals can be categorized into several subsets like sensory, routines, and physical environment. Despite the fact that the home setting is often a secure and consistent environment, these aspects were identified as crucial. Consequently, one should give some thought to the consequences that this could have in other settings where it would be harder to exercise control. The identification of these factors and the impact they have enables a better understanding of the interaction between an autistic individual and their environment and serves to guide professionals in their interventions.

KEYWORDS

autism, neurodevelopment problems, physical environment, sensory issues

1 | INTRODUCTION

Autism spectrum disorder (ASD) is a neurodevelopmental disorder that begins early in life and is used to

describe individuals with a specific combination of impaired social communication and repetitive behavior, highly restricted interests, and/or sensory behaviors with clinical heterogeneity based on genetics and brain development and connectivity (Karagöz & Gündoğdu, 2022; Yılmaz, 2023). The prevalence of ASD, which is one of

Abbreviations: ASD, autism spectrum disorders; R1, first reduction stage; M7, Mothers seventh.

the most common neurodevelopmental disorders in childhood and is estimated to affect approximately 1% of the population worldwide, is increasing day by day. In ASD, the coexistence of two or more disorders is usually noticed in the same individual.

Autistic individuals have pharmacological supports that can improve social communication, reduce anxiety and aggression, and medications that can minimize comorbid symptoms. Because there is no single treatment for ASD, medical support that relieves symptoms and evidence-based treatments that begin early in development benefit autistic children. In addition, in order to carry out the treatments in the center such as that school and clinic in the home environment and to increase the adaptation behaviors of these children, not only the school and clinical environments but also the home environments should be structured. Environmental hazards for autistic children are limited, and family and residential environments should be regulated under preventive protective systems (Pfeiffer et al., 2017). In the literature, home accidents may be at the beginning of the risky situations. Safety skills to prevent domestic accidents are often addressed by classifying them according to parts of the home, such as the kitchen, bathroom, and general living quarters (Collins et al., 1991).

Other conditions that involve risk and indirectly affect the physical and mental health of the autistic child are related to well-being. The quality of life of autistic individuals is lower than that of the general population, and environmental systems, such as the individual's home environment, are thought to affect well-being (McConachie et al., 2018). It has been noted that autistic children may be more sensitive to sensory stimuli in the environment, such as texture, color, type of light, or shape of objects, including noise or excessive visual stimuli (Mostafa, 2014; Pfeiffer et al., 2017; Sánchez et al., 2011). Since certain elements (e.g., noise) can trigger tantrums or cause inappropriate behavior, there is a potential for self-harm on the individual. Another condition that can jeopardize the health of the child is unresponsiveness to pain. Insensitivity to pain can be experienced during an accident or attempted self-harm and is counted among the common behaviors in this population (Richards et al., 2012). It is therefore particularly important to structure the environment in a way that ensures environmental safety (Brown & Dunn, 2010; Kirby et al., 2017).

1.1 | Sensory data processing

The term “Sensory Processing-Sensory Integration Deficiencies” may be used to refer to one of the challenges

that may be encountered in connection with ASD. According to Tomchek and Dunn (2007), sensory processing disorder is a complicated brain disorder that appears to impact the way in which children receive ordinary sensory information. This includes processing of the auditory, visual, and tactile senses. The presumption underlying the majority of hypotheses regarding autism spectrum disorder is that people with the disorder process sensory information in a manner distinct from that of typically developing people. Early hypotheses about the origins of atypical behavior in autistic individuals were based on observations of either overstimulation or under-arousal to sensory stimuli. These data formed the basis for these theories. According to the majority of the currently accepted hypotheses about ASD, problems in sensory processing are one of the most prominent symptoms of autism. These abnormalities also have repercussions for the development of the perceptual system in autistic children. Children are far more likely to become upset and overreact when they are presented with stimuli such as bright lights, loud noises, strong odors, and different textures. According to Dawson and Watling (2000), children diagnosed with ASD have issues with their sensory processing in a percentage ranging from 30% to 100%. According to Quill (2000), autistic children frequently struggle to manage sensory stimuli such as information that is visual, aural, or tactile. Therefore, it may be concluded that the regulatory behaviors they use are for the purpose of managing the information that is received from the senses. These regulatory behaviors may include clapping their hands, covering their ears to block out hearing, bouncing up and down, panicking, withdrawing when touched, avoiding specific textures and odors, and/or waving their fingers in front of their eyes (Pi et al., 2023). On the basis of these complicated sensory processing issues, there emerges a series of explainable cause-effect correlations about how toddlers manage with their environment and how they stumble upon challenging behaviors (Iarocci & McDonald, 2006). The conclusion that can be drawn from this is that children's difficulties in processing their senses are the root cause of their behavioral issues.

1.1.1 | Routines and organizations

Some of the difficulties experienced may be due to the needs of autistic children for routines and configurations. Most autistic children prefer routines because routines seem to serve to avoid anxiety by providing structure and predictability. The calmness that is free from anxiety and the regularity of the physical environment seem to increase the child's ability to function. Routines can

support autistic children by improving understanding of a daily event and/or activity and can help the child manage stress and anxiety. It is stated that the child's need for routines may increase during times of stress or illness during daily events involving change (Attwood, 2006).

1.1.2 | Visual schedules

One type of staging intervention that can be used as transition support is a visual activity chart. Visual activity charts are useful because while harnessing the power of visual processing, they provide support for some common deficits that autistic children experience such as auditory processing, language use, and memory (Ganz et al., 2014). This tool contains pictures, drawings, objects, or images arranged in order to show autistic children the order of their day (Banda et al., 2009). An activity chart can be used to help autistic children transition between activities (Bryan & Gast, 2000); they function by showing them the current activity, the next activity, and giving a concrete signal for the completion of an activity.

1.1.3 | Anxiety at home

Most families recognize the safety of their autistic children as a major concern and often have to make environmental changes to ensure their children's safety. Typical safety precautions and changes are made in the first few years of childhood. These adaptations can take place in many different possibilities such as doors, door locks, camera monitoring of the environment, child-proof cabinets, and turning off electrical outlets. For autistic children, these reassurances last longer than expected and require all family members to adjust and monitor their behavior (Nevison et al., 2018). In addition, the autistic child may exhibit inappropriate behaviors such as climbing and/or jumping from furniture to meet an unmet sensory need. In this case, families may prefer to use more solid, rounded, or fixed furniture with sharp edges.

1.1.4 | Generalization at home of what is learned at school

It is helpful to remember that families may need guidance on how best to structure their routines and home surroundings to adapt to the demands of their children and encourage learning opportunities. This is something that should be considered in order to provide assistance. The next discussion will focus on particular aspects of the physical environment, such as the landscaping,

the aesthetics, the accessibility, and utilization of visual aids, as well as the effect of safety and security on the environment.

1.1.5 | Home environment

There is no specific research that has been identified on how the environment of the household affects autistic children. On the other hand, there has been some research done on the topic of how the physical environment of the classroom plays an essential part in the lives of preschool children who have special needs (Boyd et al., 2008). The physical arrangement and classroom layout (such as organization), aesthetics (such as colors and textures, lighting), usage of visual aids in the environment, and measures to promote safety and security in the environment are all considered as parts of the classroom.

According to Mostafa (2014), the majority of the study on the person-environment interaction in relation to ASD has been conducted on children who participate in activities and studies while they are at school. However, there has not been a lot of research done on the family surroundings of autistic children. The home is the location where a person spends the most of their time and often includes other people, such as their parents and siblings, in addition to the non-human surroundings and its characteristics. Since the symptoms of autistic individuals continue throughout life (Murphy et al., 2016), environmental characteristics that may affect adults living with ASD need to be determined in order to provide more accurate interventions from both health professionals and professionals who receive special education. It is thought that the information provided by the individual's environment can be very useful in determining these characteristics. It can be said that the views of the parents are related to the experiences since they share the same house with their autistic children. Since the environment is influential on one's activities and roles, this study is based on the Competence Model (Rousseau, 2017; Rousseau et al., 2002). This model explains the interaction between person and environment through six concepts: person, environment (human and non-human), activities, roles, competence status, and handicap status.

Activities and roles represent interaction; thus, the person is positioned in a state of continuity or inadequacy according to success or failure in activities and roles. The environment can provide positive or negative stimuli to the person (Rousseau et al., 2002). In this study, the non-human environment is represented by the physical elements of the house and by mothers living with autistic children. Activities and roles, respectively, were

represented by the interaction between the person and his non-human home environment. The aim of this study is to reveal the experiences and views of the mother about the characteristics of the home environment that affect the behavior of her autistic child.

2 | MATERIAL AND METOD

The study was conducted in a qualitative interpretative descriptive research format using the focus group technique (Krueger & Casey, 2015; Thorne, 2016). The research questions were as follows: (1) What are the elements of the non-human home environment that influence your child's behavior? (2) How do these factors affect your child's activities at home? To seek answers to these questions, (1) brief information about the participants, (2) information about the data collection process, and (3) analysis of the data were presented.

2.1 | Participants

The research ethics committee at Girne American University (24th October 2022/5/22-130) approved this study and all participants gave written informed consent before enrolment. The criteria used in the selection of the participants are as follows: (1) being the family of a child diagnosed with ASD and attending primary school, (2) having a family with Turkish communication and living in Ankara, (3) having married or divorced parents living in separate houses in the family. Thus, the criteria of homogeneity (having an autistic child) and heterogeneity (different families) were met in the study (Morgan, 1996).

The concept of universe can mean a continent, a country, a city, and an institution, as well as masses that contain certain demographic characteristics such as a profession, gender, race, age, and marital status. The universe of this research is a private special education school in Ankara. The participants are the mothers of students

from all central districts of Ankara who have been diagnosed with ASD and attend a special education center (Table 1).

2.2 | Data collecting

"Focus groups" were chosen as the preferred data collection technique (Wilson, 1997). After obtaining verbal consent from the mothers to participate in the study, the consent form was signed during the group meeting when they came to the special education school and the answers to the related questions were recorded by the teachers. Mothers of autistic children who voluntarily participated in the study were included in focus groups ($n = 67$). The meetings were held at the special education center at different intervals. In order to ensure the participation of the mothers, the hours they came to the school were selected and an adaptation was made to include at least two and at most six mothers. There is a moderator and teachers who are assistant moderators in each session. The moderator is a research specialist and a graduate student with focus group lead experience. The assistant moderator, also a graduate student, took notes throughout the meetings to complete the information obtained from the recording. A summary study was conducted at the end of each meeting to verify the elements stated by the participants, and the answers given were reviewed. The nature of the subject supports the detailed sharing of the participants, so that it is possible to obtain more reliable data as smaller groups allow the participants to express themselves better. The length of group sessions was set to be 2×45 min, and all sessions were recorded (audio).

The interview guide used by the moderator consisted of open-ended questions. In the sessions, mothers were asked to share their additional observations. It consists of the conceptual framework of the study and the subsection units guided by Krueger and Casey (2015): Sessions were held as opening, introduction, transition, key and final questions (Table 2). Examples of key

TABLE 1 Socio-demographic data of participants (mothers) at the time of the interviews.

Socio-demographic variables	N	Mean (range)	%
Age (years)	67	42.9 (22–67)	
Employment status (paid employment)	36		53.7
Employment status (unemployed)	31		46.3
Type of accommodation (apartment)	61		91
Type of accommodation (house)	6		9
Home adaptations (at least 1)	67		100

TABLE 2 Type of home adaptations.

Type of home adaptations	N	%
1. Relaxation corner	4	6
2. Event corner	16	24
3. Large storage areas—avoid clutter	67	100
4. Large storage areas—toxic substance safety	5	7
5. Dedicated area for visual schedules	37	55
6. Dedicated space for assistive technology tools	0	0
7. Wall paint color selection	0	0
8. Adaptations in ambient acoustics	5	7
9. Lighting adaptations	9	13
10. Sensory room	48	72
11. Air conditioning	2	3
12. Noise adaptations	5	7
13. Personal space for privacy	3	4
14. Safe room for tantrums	0	0
15. Safe home environment for visitors, guests	10	15
16. Indoor/garden safe play environment	51	76
17. Durable household material	67	100
18. Fixing things	19	28
19. Window-exterior door security locks	42	63
20. Bathroom and kitchen security	10	15
21. Advanced tracking technology for privacy	12	18

questions used in the study are as follows: (1) Think about your child's behavior at home. Can you list at least three elements of the non-human environment that have the most impact on your child's behavior, both positive and negative? The last question asked in the research: (2) If you could build the ideal home for your child and family from the start, what would it be like? Please explain.

2.3 | Data analysis

A thematic content analysis was conducted (Neuendorf, 2018). First, the audio recording was transcribed verbatim (Rousseau et al., 2002). The coding was validated on text excerpts made separately by the two authors, with a 78% agreement. The percentage of verification can be explained by the overlap of some codes.

The transcripts made with voice recording were coded using the Nvivo software program (QSR International, 2018). Then, the first and second authors in the study performed data reduction in one step (R1) depending on the codes. In this reduction, consistency between the two researchers was ensured

and the themes and sub-themes were determined (Neuendorf, 2018). For example, in the first reduction stage (R1), the data were not migrated to the new code, as consistency was determined after creating a table with the first code of some quotations from the word-by-word.

2.4 | Limitations

This research was conducted in Turkey and Ankara districts and represents a small part of the Turkish sample. In addition, considering the heterogeneity of ASD profiles, it is known that the needs of children will differ according to the severity of the disorder and the types of symptoms (Charman, 2014; Fountain et al., 2012; Nazeer & Ghaziuddin, 2012). For this reason, it is necessary to conduct the research with high number of participants.

3 | DISCUSSION AND RESULTS

The aim of this study is to reveal the experiences and views of the mother about the characteristics of the home environment that affect the behavior of her autistic child. Examples of key questions used in the study are as follows: (1) Think about your child's behavior at home. Can you list at least three elements of the non-human environment that have the most impact on your child's behavior, both positive and negative? The last question asked in the research: (2) If you could build the ideal home for your child and family from the start, what would it be like?

The first question asked in the research was examined and the factors that will have the most positive effect on the behavior of the mothers' children are to prevent clutter in the house (100%), to ensure that the materials taken into the house are strong, not to harm the child when broken, and when the sensory room is built and used for sensory integration studies, their children will be more sensitive to environmental stimuli. They also stated that they believed that autistic children would give appropriate feedback (72%). Mothers reported that leaving a special area in the house for assistive technology devices, choosing special wall colors in the house, and allocating a special room for tantrums were the conditions that had a minimum impact on their children (0%).

Asked in the survey (2) "If you could build the ideal home for your child and family from the start, what would it be like?" The answers given by the mothers to the last question were divided into sections and the following results were obtained.

Mothers stated that a relaxation area should be created for the child by providing a quiet place for their autistic children to be organized and enjoy sameness. (Mothers seventh) M7 “It would be great if there were a few secluded or secluded corners in the house where no one would disturb you and where you can enjoy peace and quiet.” M28 “He could play music by himself, listen to music, even practice reading aloud to himself.” Mothers suggested that the child use headphones instead of adjusting the acoustics of the rooms. M25, M46, M57 “Can use headphones to prevent sound.” They argued that a sensory room may be needed for children to respond appropriately to sensory stimuli, but stimuli such as paint color, light, and noise should be used carefully in the house.

In addition, mothers ensured clear, simple, and predictable building layout and spaces/corners, using visual cues to line up activities and items and hanging them regularly in appropriate places in the home, using visual cues to identify what is behind doors (toilet, bedroom, etc.).

In order for children with autism to have a high quality of life and improve their well-being and to help the child calm down after a tantrum or excessive stress, it is necessary to provide the necessary personal space to respect individual privacy and welfare rights and to create a “quiet room” consisting of items that will not cause harm. They explained to their suggestions that a suitable space should be provided at home for them to interact with peers, parents, and society. M53 “No one wants us to their house. If he has his own room, they can play in his private room with their peers and relatives.” Mothers emphasized that both small and large areas should be provided to perform games and gross motor activities in their house plans, and they also stated that corridors should be wide. They also stated that safe physical boundaries should be established in order to provide freedom of movement in closed areas, and lock and camera systems could be installed. They explained that the household items should be strong enough to withstand behaviors involving anger, but they stated that the items should be fixed so that they do not cause damage in the event of an earthquake. They explained that there will be a need for abundant storage areas in the house, so that the environment will be more organized and clutter will be easy to collect.

4 | CONCLUSION

Creating a safe and secure environment is a primary concern for the well-being of autistic children, as with all children. Many professionals (Burton-Hoyle, 2011;

Case-Smith & Arbesman, 2008; Inan, 2009) have observed that simple environmental changes can play an important role in the lives of children with special needs, especially. Simple changes such as a quiet corner or rocking chairs and armchairs are beneficial for overwhelmed children to encourage sensory regulation and reduce inappropriate behavior (Case-Smith & Arbesman, 2008; Inan, 2009). Allen and Schwartz (1996) explained that it is important that the physical environment be free of any obstacles (e.g., clutter, slippery floors, and crumpled rugs) so that serious injuries do not occur. While Quill (2000) states that a distracting environment has the potential to react negatively to the environment, Moore (1996) acknowledges that safety may be hindered if the space is too small and there are too many people in it, and recommends spacious living spaces for autistic children. Additionally, children may be adversely affected by noise and confusion, which may require more supervision. The reviewed research findings support the idea that physical environments may be important considerations for autistic children. Davis and Fox (1999), in 43 studies dealing with environment regulation and/or modification, reveal the importance of the physical environment and show parallelism with the findings of this study. The results of this study can guide professionals in their intervention in this population. However, more research is needed to better understand human-environment interaction in the living environment and to provide tools for professionals.

5 | RECOMMEDATIONS

- If you have recently learned that your child has or may have autism spectrum disorder, you are probably wondering what will happen next. No parent is ready to hear that their child is not happy and healthy, and a diagnosis of ASD can be especially frightening.
- There are many treatments that can help children with ASD learn new skills and overcome a wide range of developmental challenges. From free government services to at-home behavior therapy and school-based programs, there is help available to meet your child's specific needs and help them learn, grow, and succeed in life.
- Figure out what triggers your kid's challenging or disruptive behaviors and what elicits a positive response. What does your child find stressful or frightening? If you understand what affects your child, you will be better at troubleshooting problems and preventing or modifying situations that cause difficulties.
- Accept your child, his quirks, and all. Recognize how different your child with autism is from other children and celebrate your child's small successes. Make him

feel unconditionally loved and accepted. It will help your child more than anything.

- Do not give up. People with autism also have a whole life to grow and develop their abilities.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICS STATEMENT

All study procedures were approved by the relevant institutional review boards at each clinical data collection site and the study was conducted in accordance with the Declaration of Helsinki, with informed written consent from the participants prior to the study.

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