Journal of Physics: Conference Series

Comfortable and safe environments for people with autism: preliminary analysis of risks and definition of priorities in the design phase

To cite this article: L Zaniboni *et al* 2021 *J. Phys.: Conf. Ser.* **2069** 012177

Comfortable and safe environments for people with autism: preliminary analysis of risks and definition of priorities in the design phase

L Zaniboni[1], A Marzi[1], M Caniato[1], A Gasparella[1]

[1] Faculty of Science and Technologies, Free University of Bozen-Bolzano, Piazza Università 5, 39100, Bolzano, IT

luca.zaniboni@unibz.it

Abstract. People with autism deserve specific attention as concern environmental comfort, well-being and accessibility of environments, not only because they are a significant and growing share of the total population, but also because they can show special sensitiveness to the variation and value of several environmental parameters. In this work, the main building-related critical issues connected to the special environmental sensitivity in the autism spectrum condition are highlighted and analysed. By means of a questionnaires' survey among parents and caregivers of people with autism, their sensitivity to different thermal, visual, acoustic and indoor air quality stimuli was evaluated. Then, a list of risk factors was prepared for a residential context, classifying them into environmental risks, leading to discomfort and dangerous response for people with autism; and accidental risks, deriving from unpredictable events, even more dangerous for people with special perceptual disorders. According to the outcomes of the survey and based on literature considerations, probability and severity of environmental and accidental risks were estimated on a scale from 1 to 5 in the different rooms of residential buildings. This permitted to draw up a hypothetical system of possible interventions and solutions to be considered during the design phase, establishing a different priority in the different rooms of a dwelling, in order to increase the occupant's comfort, safety and autonomy, and improving physical and psychological well-being.

1. Introduction

Individuals with autism constitute a relevant share in the word population, since about 1 over 270 people is diagnosed to be on the spectrum [1]. People with autism can have different sensitivity to the 5-senses stimuli [2-10], which might even lead to crises and dangerous situations such as self-injuries [11]. Moreover, depending on the autism level and the presence of co-morbidities, they might need care and support [12-14]. For these reasons, enhancing the comfort, well-being and safety of individuals with autism constitutes a fundamental milestone in the fields of living home engineering and design. Several documents regarding studies and recommendations on the architectural design for people with autism were found [2,6,9,15-21]. These essays generally recommend: 1. The necessity of a safe and organized environment, avoiding open spaces and improving independence; 2. The importance of spatial configuration, proportion and zoning, with the separation of high-stimulus areas (kitchen, bathroom, …); 3. The importance of acoustics, avoiding echo, loud, background noises; 4. The avoidance of stimuli causing distraction (background noises, light flickering); 5. The choice of the proper colours, including furniture, decorations and light (avoiding fluorescent lamps and ensuring a correct balance between artificial and natural light); 6. The ensuring of a correct choice of furniture and object distribution and shapes; 7. The creation of escape spaces, compensating the excess or deficit of stimuli in other environments; 8. The necessity of further studies to obtain additional objective data for design recommendations. Even though literature often focuses on the design of safe environments for children with autism, the additional exploitation of passive technological aid, the level of autonomy of young adults and adults with autism (especially high functional) could be increased with a possible reduction of their symptoms and improvement of their daily life skills [22-31]. This would permit to achieve all the positive health and social effects typical of home accessibility [32], including positive altering on their behaviour with specific design interventions concerning their sensory environment [15]. Nevertheless, standards and guidelines comprehensive of architectural and technological solutions are still few. In this preliminary study, a survey conducted among individuals with autism and their caregivers permitted to highlight the environmental stimuli which caused the major stresses among people on the autism spectrum. By means of the results of this survey, interviews with experts, individuals with autism and associations giving care and a literature research, a list of *environmental* and *accidental risks* was prepared, and their *probability* and *severity* levels set in the rooms of a standard dwelling was estimated. Finally, possible design interventions and technical solutions were hypothesized, in order to decrease the risk levels and improve the safety and independence of people with autism. The study was conducted as part of the EU Interreg SENSHome project, which involves several research partners in the development of "a new smart home design and technologies to be applicable to houses 'as normal as possible' to be inhabited autonomously by disable people, especially for autistic people" [33]. This paper was written according to the language acceptability indications of Autism-Europe [34].

2. Methodology

A survey by means of anonymous questionnaires was conducted in several Italian and Austrian associations of assistance and support. Due to the high share of individuals with interactive and communicative difficulties, the survey needed to be completed by a third-party. To overcome the possible bias due to the fact that the interested users were not directly answering, these methodologies were used: 1. Different types of respondents (caregivers, parents and autonomous people with autism); 2. Use of a sensitivity scale instead than satisfaction or sensation scale, more directly observable by a third-party. The respondents needed to indicate if particular sensitivities to environmental stimuli from the four comfort fields (thermo-hygrometric, acoustic, visual and indoor air quality/IAQ) were present among their assisted or, when possible, themselves. The sensitivity levels were assigned according to the values reported in Table 1: particular sensitivities differentiate people on the autism spectrum from standard users as concerns the specific stimulus considered. In order to highlight the stimuli creating a major reaction in people on the spectrum, the percentage of respondents indicating 2, S-2, 3 or S-3 was highlighted in this essay.

Table 1. Sensitivity levels used in questionnaires' surveys.

Sens. Level	Explanation
Absent (0)	When abnormal stress levels are not produced
Minor (1)	When increased stress levels are present with limited and/or non-systematic intensity and/or frequency
Average (2)	When increased stress levels of average intensity and/or frequency are systematically present
Extreme (3)	When increased stress levels of high intensity and/or frequency are systematically present
Sporadic (S)	When increased sensitivity is sporadic and non-systematic (due to few observations, low repeatability or predictability), even if of high intensity. If used, this option needs to be followed with one of the aforementioned levels (1, 2 and 3)
Hypo-sensitive (H)	When hyposensitive to the related stimulus (i.e., no reaction despite the presence of an obvious stimulus). This option needs to be used alone

In order to analyse how the home safety of people with autism can be improved, two types of risks were defined as follows:

- *Environmental risks*: variations in the environmental parameters which can cause discomfort and even stress and crises due to possible higher sensitivity.

- *Accidental risks*: risks due to unexpected events or accidents, which consequences might be even more serious with people on the autism spectrum.

The second point comprises both routine events which would not be an issue for standard users, such as the fall of an object generating noise, and dangerous events for which individuals with autism might not be able to react properly, such as the presence of a fire with an alarm ringing. A list of all the possible *environmental* and *accidental risks* was developed according to the questionnaires' experience, interviews with psychologists, individuals with autism and their parents and professional caregivers (organized in the context of the SENSHome project) and research on national and international guidelines and literature regarding safety and risks in living environments [35-41]. Depending on the different standard rooms of a typical dwelling (kitchen, living room, bedroom, bathroom, corridor, storage room) [35], levels of *probability* (the possibility of an *environmental* or *accidental risk* to happen) and *severity* (the seriousness/level of danger of an event) were assigned from 1 (lower) to 5 (higher) to every *environmental* and *accidental risk*: to do that, experience in studies about autism spectrum condition (literature research, interviews with caregivers and psychologists) were combined with the analysis of the typical risks due to conformations, furniture and usage of the different rooms indicated in literature [35-41]. The assignment of *severity* to *environmental risks* depended on the answers to questionnaires. In fact, the levels were assigned according to the percentage of respondents answering only "sporadically average", "average", "sporadically extreme" or "extreme" (Table 1), as follows: 1. Level 1 for 0 – 9 %; 2. Level 2 for 10 – 24 %; 3. Level 3 for 25 – 44 %; 4. Level 4 for 45 – 69 %; 5. Level 5 for ≥ 70 %. On the other hand, the *severity* of *accidental risks* also took into account the rooms where the hazardous events might occur more easily. This procedure permitted to distinguish the more probable and dangerous events which might happen in living environments, setting the priorities in the possible interventions, as well as to identify the most dangerous rooms in which more assistance and design solutions are necessary. A system of design, architectural and sensors' solutions was hypothesized, also highlighting their capability to solve multiple issues and risks.

3. Results and discussions

3.1. Questionnaires' surveys to highlight the different sensitivity to environmental stimuli

A total number of 146 questionnaires was collected. A low number of individuals was found to be hypo-sensitive: the highest amount was equal to 6 % and regarded the thermal environment. From Figures 1 and 2 it is clear that, in accordance with the literature, the most problematic field is the acoustics, with 60 % of respondents being particularly sensitive. Most problematic stimuli were high noises from inside (58 %) and adjacent environments (43 %), as well as particular sounds such as impacts (48 %) and reverberation (35 %). This is a very important factor, since impacts and crashes can also be produced by *accidental* events, such as objects falling. Other comfort fields did not show such a big percentage of sensitive respondents: heat exposure (23 %), high illuminance (24 %), high contrast and glare (23 %), particular light sources or phenomena (21 %) and odours (19 %) showed the highest amounts.

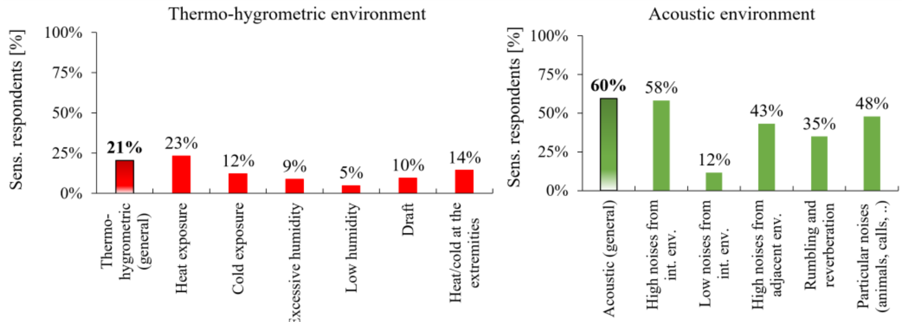

Figure 1. The percentage of respondents indicating 2, S-2, 3 or S-3 as regards thermo-hygrometric and acoustic stimuli.

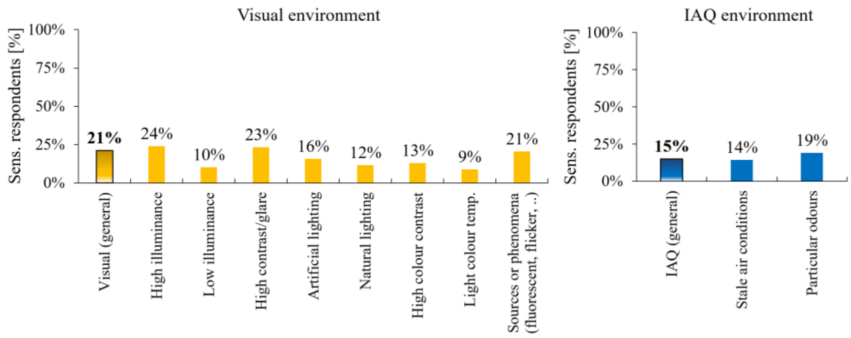

Figure 2. The percentage of respondents indicating 2, S-2, 3 or S-3 as regards visual and IAQ stimuli.

3.2. Environmental and accidental risks: probability and severity in typical rooms
The *environmental risks* related with the acoustics have the highest *severity* (Table 2). Most of these risks, such as temperature and humidity variations or presence of odours, have a higher *probability* to happen in environments such as kitchen or bathroom, due to the massive use of hot water and the usage of these rooms. Other environments, such as living room and bedroom, present issues due to the high time that people normally pass in these rooms (sounds and drafts due to window openings, other noises, …): quietness and feeling at ease is fundamental in these rooms. On the other hand, corridor and storage room might have higher light discomfort (flicker, prevalence of artificial light, …) due to the installation of energy saving and "less cosy" lamps (i.e., fluorescent light bulbs).
From Table 3 it is possible to notice that *accidental risks* comprise: 1. casualties which would be dangerous for anybody (fires, burns, electrical, …), but are even more risky for people with autism, since they might not be able to react properly or not recognize the presence of a risk due, for instance, to hyposensitivity; 2. Events that are not particularly dangerous for standard users, but might cause unease and crises in individuals with autism (falls of objects, presence of bulky objects, objects not in the right place, …); 3. Consequences of crises themselves (from unease behaviours to yelling or even self-harm). Table 3 shows higher criticalities in kitchen and bathroom also as concerns the *accidental risks*. The *probability* of hazardous events is higher in these environments, due to the activities performed. Also, the *severity* of *accidental risks* is higher in these environments, primarily due to the consequences that these events could have. *Probability* and *severity* of *accidental risks* are quite high also in storage room, but people generally do not pass a lot of time in this environment, as well as in the corridor.

Table 2. *Probability* and *severity* of *environmental risks* in the typical rooms of a dwelling.

	Probability						Severity					
	Kitchen	Living Room	Bedroom	Bathroom	Corridor	Storage Room	Kitchen	Living Room	Bedroom	Bathroom	Corridor	Storage Room
Temperature variation	5	4	4	5	3	3	2	2	2	2	2	2
Humidity variation	5	3	3	5	1	2	1	1	1	1	1	1
Air draft	4	4	4	4	2	1	2	2	2	2	2	2
Loud noises from inside	5	5	4	5	2	3	4	4	4	4	4	4
Low noises from inside	5	5	5	5	5	5	2	2	2	2	2	2
Sounds from outside or close apartments	5	5	5	4	4	4	3	3	3	3	3	3
Echo and reverberation	4	3	3	4	2	2	3	3	3	3	3	3
Particular noises (calls, animals, impacts, …)	5	5	5	5	3	3	4	4	4	4	4	4
Too quiet environment	3	5	5	4	4	4	2	2	2	2	2	2
Light variation (glare, low or high)	5	5	4	5	3	2	2	2	2	2	2	2

Prevalence of natural or artificial light	4	4	4	4	5	5	2	2	2	2	2	2
Light colour (cold/warm)	4	4	4	4	5	5	1	1	1	1	1	1
Light sources or phenomena	4	4	4	4	5	5	2	2	2	2	2	2
Stuffy air	4	3	3	4	3	4	2	2	2	2	2	2
Odours	5	3	3	5	3	4	2	2	2	2	2	2

Table 3. *Probability* and *severity* of *accidental risks* in the typical rooms of a dwelling.

	Probability						**Severity**					
	Kitchen	Living Room	Bedroom	Bathroom	Corridor	Storage Room	Kitchen	Living Room	Bedroom	Bathroom	Corridor	Storage Room
Falls	3	2	2	3	2	3	4	3	3	4	3	3
Falls from dangerous heights	2	2	2	2	1	2	5	4	4	5	4	5
Hands / fingers crushing, injuries from hazardous objects	3	2	2	2	1	3	4	3	3	4	3	3
Break/damage of objects (glass, mirrors, …) & consequent injuries	3	2	2	3	1	2	4	3	3	4	3	3
Burns	5	1	1	3	1	1	4	3	3	4	3	3
Electrical risks	3	1	1	3	1	1	5	4	4	5	4	4
Fires	2	1	1	1	1	1	5	5	5	5	5	5
Asphyxiation, gas-poisoning	2	1	1	2	1	1	5	5	5	5	5	5
Chocking/drowning	2	2	2	2	1	1	5	5	5	5	5	5
Chemical risk, poisoning from substances, irritation	3	1	1	3	1	2	5	5	5	5	5	5
Fall of objects	5	4	4	5	3	5	3	2	2	3	2	3
Presence of bulky objects/furniture	4	4	4	3	3	5	2	1	1	2	1	2
Water/humidity on the floor	5	2	2	5	1	2	2	1	1	2	1	1
Slippery substances on the floor	4	2	2	4	1	2	3	2	2	3	2	2
Access to medicines	3	3	3	4	1	3	3	3	3	3	3	3
Excessive filling of spaces, objects not in the right place	4	3	3	4	2	5	2	1	1	2	1	2
Consequences of crises (i.e., unease behaviours, yelling, self-harm)	2	2	2	2	1	1	4	4	4	4	4	4

3.3. General discussion about possible interventions and solutions

The procedure above permitted to highlight the main risks and action priorities in the design of typical dwelling rooms. It is very important to highlight again how the procedure to estimate the *severity* of *environmental risks* permitted to set a level of priority basing on the sensitivity of the majority of people on the autism spectrum. Nevertheless, shares of individuals who are highly sensitive to all the stimuli are present: a good design as regards all the environmental characteristics is recommended. The same consideration is generalizable to the *accidental risks*: some risks have a higher *probability* and *severity*, especially in some specific rooms, but all the risks need of a good prevention in all the home environments.

The interventions to overcome *environmental* and *accidental risks* can be categorized into:

- *Risk prevention*, involving architectural or technological solutions implemented to prevent a risk (i.e., avoidance of the use of stairs, open spaces with solid furniture, thermostats and thermal regulation of environments, …);
- *Risk detection*, involving technological solutions, mainly sensors, to detect that a hazardous event has verified (i.e., sound pressure sensors, fire sensors, …)
- *Risk communication and reaction*, involving the solutions to prevent the consequences of a risk, for instance sending an early warning to parents or caregivers (smartphones, tablets, alarms, …).

All these solutions need to interact and operate in synergy, in order to allow life of individuals with autism to be as autonomous as possible. Let us take the fall of the person as an example. The *prevention* could be implemented by architectural solutions such as avoiding the presence of carpets, bulky objects, stairs, obstacles or narrow environments. The *detection* can, for instance, be actuated by sound sensors detecting the impact and/or shouting of the individual as a result of a possible crisis. The system could now *communicate* to the caregiver, sending an early warning by means of an alarm and message on a portable device (i.e., smartphone). This example also tells us how different events and risks are inter-connected. Moreover, same sensors and interventions can be used for multiple events: for instance, the crisis reaction might be due to different unexpected events. Furthermore, the sound sensor of the example can be used both to detect the sounds due to the reaction (shouting, crisis, …) and potential discomfortable noises which could lead to a crisis themselves. Design and technical solutions are easier to be applied in new built environments than in existing ones, especially as concerns architectural solutions. Moreover, advanced home-automation systems could additionally provide fixing of some of the events: regulation of temperature and humidity by HVAC, opening or closing of windows and shadings to avoid noise, ventilate and exploit daylight, etc. Eventually, it is important to highlight that these solutions can be adopted more easily with lower levels of autism, when people already have a high level of autonomy and often live alone. Nevertheless, good improvements might happen also with higher levels, occasionally permitting to caregivers to leave cared adult or young adult individuals alone. Sensors or other solutions disturbing privacy (such as cameras) should be avoided.

4. Conclusions

By means of a questionnaire survey, literature research and interviews with experts, the main *environmental* (due to variation of environmental stimuli) and *accidental risks* (unexpected hazardous events) were identified in the different rooms of a typical dwelling for people with autism, together with their *probability* and *severity*. A hypothesis of system of prevention and detection of risks was articulated, creating a possible starting point for future deeper research and development of guidelines and standards. It was observed that a high share of individuals with autism express a strong nuisance from acoustic related stimuli: the proper design of dwellings on the acoustic point of view (i.e., avoiding reverberation or using sound insulant materials) is fundamental for their well-being. Other stimuli such as flickering, high illuminance, glare, odours or heat exposure are also disturbing for a consistent number of people on the autism spectrum. Since they might overreact also to standard and routine events, individuals with autism need particular attention as regards the variations of environmental parameters (*environmental risks*). *Accidental risks* comprise both routine situations (i.e., fall of an object) and real hazardous events (i.e., a fire): a person with autism could not be able to react properly to both these events, causing him/herself even more danger. Because of the activities performed, kitchen and bathroom are the most-risky environments and need special attention in the design for people on the autism spectrum. On the other hand, quietness is very important in all the rooms, especially the ones where most time is spent (living room, bedroom). A system of *prevention* (use of sound absorbing materials, avoidance of bulky objects, use of thermo-regulation, …)., *detection* (i.e., temperature change, loud noise, crisis of the individual, …) and *communication* (early warnings to the caregivers by means of portable devices) is of paramount importance to increase the independence of people with autism in their adulthood or teenage. Some solutions can work to prevent and detect multiple risks (i.e., sound-sensors both detecting disturbance noises, many *accidental risks* causing impacts and also individuals' crises themselves).

Acknowledgments
This work was financed by the European Interreg SENSHome project, ITAT 1088 CUP: I54I18000310006. The authors want to thank Michele Borghetto for his precious help in defining the correct questions form and all the partners of the European Project SENSHome, which helped us with their contributions. We warmly thank the Acting Director of Autism-Europe for the precious indications regarding language acceptability. This research was conducted and concluded with the approval of the Free University of Bozen-Bolzano Ethics Committee.

References

[1] World Health Organization. *Autism spectrum disorders*. https://www.who.int/news-room/fact-sheets/detail/autism-spectrum-disorders (acc. 10/05/21)

[2] Mostafa M 2014 *Architecture for Autism: Autism ASPECTSS in School Design. ArchNet-IJAR* **8(1)**

[3] Wali L J and Sanfilippo F 2019 *A Review of the State-of-the-Art of Assistive Technology for People with ASD in the Workplace and in Everyday Life. In Conference on e-Business, e-Services and e-Society* (Springer, Cham) p 520-32

[4] Belek B *2019 Articulating sensory sensitivity: From bodies with autism to autistic bodies. Med. Anthropol.* **38(1)** 30-43

[5] Schofield J, Scott C, Spikins P and Wright B 2020 *Autism Spectrum Condition and the Built Environment: New Perspectives on Place Attachment and Cultural Heritage. The Historic Environment: Policy & Practice* 1-28

[6] Gaines K, Bourne A, Pearson M and Kleibrink M *2016 Designing for autism spectrum disorders.* (Routledge)

[7] Jones E K, Hanley M and Riby D M 2020 *Distraction, distress and diversity: Exploring the impact of sensory processing differences on learning and school life for pupils with autism spectrum disorders. Res. Autism. Spect. Dis.* **72** 101515

[8] Dival M *2019 Different Buildings for Different Minds: A Churchill Fellowship Report*. (Enabling Spaces)

[9] Shell S. *Why Buildings for Autistic People Are Better for Everyone*. (AIA, WELL AP, LEED BD+C, Forte Building Science, a division of M. E. Group)

[10] Giarelli E, Nocera R, Turchi R, Hardie T L, Pagano R and Yuan C 2014 *Sensory stimuli as obstacles to emergency care for children with autism spectrum disorder. Adv. Emerg. Nurs. J.* **36(2)** 145-63

[11] Minshawi N F, Hurwitz S, Fodstad J C, Biebl S, Morriss D H and McDougle C J 2014 *The association between self-injurious behaviors and autism spectrum disorders. Psychol. Res. Behav. Manag.* **7** 125

[12] American Psychiatric Association *2013 Diagnostic and statistical manual of mental disorders (DSM-5®)*. (American Psychiatric Pub.)

[13] Christensen D L, Braun K V N, Baio J, Bilder D, Charles J, Constantino J N, ... and Lee L C 2018 *Prevalence and characteristics of autism spectrum disorder among children aged 8 years—autism and developmental disabilities monitoring network, 11 sites, United States, 2012. MMWR Surveill. Summ.* **65(13)** 1

[14] Rimland B and Edelson S M 1995 *Brief report: A pilot study of auditory integration training in autism. J. Autism Dev. Disord.* **25(1)** 61-70.

[15] Mostafa M 2008 *An architecture for autism: Concepts of design intervention for the autistic user. International Journal of Architectural Research* **2(1)** 189-211

[16] Long E A *2010 Classroom lighting design for students with autism spectrum disorders.* (Master Dissertation, B.S., Kansas State University)

[17] Altenmüller-Lewis U 2017 *Designing Schools for Students on the Spectrum. Des. J.* **20(sup1)** S2215-29

[18] Mostafa, M 2020 *Architecture for autism: Built environment performance in accordance to the autism ASPECTSS design index. In Autism 360°* (Academic Press) p 479-500

[19] De Franceschi *S 2011 Progettare per l'autismo.* (Master Dissertation, Sapienza Università di Roma)

[20] Porro L *2018 Strutture per le persone con disturbi dello spettro autistico. Indirizzi per la progettazione e la valutazione della qualità edilizia* (Doctoral Dissertation, Sapienza Università di Roma)

[21] Mostafa M 2014 *Architecture for autism: autism ASPECTSS™ in school design. International Journal of Architectural Research* **8(1)** 143-58

[22] Hong H, Kim J G, Abowd G D and Arriaga R I 2012 *Designing a social network to support the independence of young adults with autism. Proceedings of the ACM 2012 conference on Computer Supported Cooperative Work* p 627-36
[23] Mattys L, Noens I, Evers K and Baeyens D 2018. *"Hold me tight so I can go it alone": Developmental themes for young adults with autism spectrum disorder. Qual. Health Res.* **28(2)** 321-33
[24] Sosnowy C, Silverman C and Shattuck P 2018 *Parents' and young adults' perspectives on transition outcomes for young adults with autism. Autism* **22(1)** 29-39
[25] Taylor J L, Smith L E and Mailick M R 2014 *Engagement in vocational activities promotes behavioral development for adults with autism spectrum disorders. Journal of Autism and Developmental Disorders* **44(6)** 1447-60
[26] Kargas N, López B, Reddy V and Morris P 2015 *The relationship between auditory processing and restricted, repetitive behaviors in adults with autism spectrum disorders. J. Autism Dev. Disord.* **45(3)**
[27] Wolbring G and Leopatra V 2013 *Sensors: views of staff of a disability service organization. J. Pers. Med.* **3(1)** 23-39
[28] Burleson W, Newman N and Brotman R 2012 *Empowering independent living for people with autism: Designing supportive, low-cost, interactive e-health environments. In International Conference on Persuasive Technology* (Berlin and Heidelberg: Springer) p 13-30
[29] Chuah M and Diblasio M 2012 *Smartphone based autism social alert system. In 2012 8th International Conference on Mobile Ad-hoc and Sensor Networks (MSN)* p 6-13
[30] Cook D J, Youngblood M, Heierman E O, Gopalratnam K, Rao S, Litvin A and Khawaja F 2003 *MavHome: An agent-based smart home. In Proceedings of the First IEEE International Conference on Pervasive Computing and Communications* (PerCom 2003) p 521-4
[31] Schafer E C, Wright S, Anderson C, Jones J, Pitts K, Bryant D, Watson M, Box J, Neve M, Mathews L and Reed M P 2016 *Assistive technology evaluations: Remote-microphone technology for children with Autism Spectrum Disorder. J. Commun. Disord.* **64** 1-17
[32] Cho H Y, MacLachlan M, Clarke M and Mannan H 2016 *Accessible home environments for people with functional limitations: a systematic review. Int. J. Env. Res. Pub. He.* **13(8)** 826
[33] European Union. Keep.eu. *The SENSHome Sensitive Home: Sensors for Special Environments. The house as normal … .* https://keep.eu/projects/22491/The-SENSHome-Sensitive-Home-EN/ (acc. 24/02/21)
[34] Autism-Europe. *Acceptable Language*. https://www.autismeurope.org/about-autism/acceptable-language/ (acc. 26/02/21)
[35] Ministero della Salute *2010 Infortuni nelle abitazioni. Manuale tecnico per gli operatori della prevenzione* (Italy)
[36] Department of Health, Social Services and Public Safety *2015 Home accident prevention strategy 2015-2025* (United Kingdom)
[37] ROSPA. *Preventing accidents in the home*. https://www.rospa.com/Home-Safety/Advice/General/Preventing-Accidents-in-the-Home.aspx (acc. 31/08/20)
[38] Mackessack-Leitch K 1978 *Domestic accidents: their cause and prevention. The Journal of the Royal College of General Practitioners* **28(186)** 38-45
[39] KFV, Kuratorium für Verkehrssicherheit. https://www.kfv.at/forschung/haushalt-freizeit-sport/fachpublikationen/ (acc. 31/08/20)
[40] Ministry of Social Affairs and Health *2014 Target programme for the prevention of Home and Leisure Accident injuries 2014-2020* (Helsinki: Finland)
[41] European Child Safety Alliance. *Childhood home safety* (Amsterdam: Netherlands)