ACCESSIBILITY AND SOCIAL PARTICIPATION IN URBAN SETTINGS FOR PEOPLE WITH AUTISM SPECTRUM DISORDER (ASD) OR AN INTELLECTUAL DISABILITY (ID)

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Abstract: Individuals with Autism Spectrum Disorder (ASD) or an Intellectual Disability (ID) often have difficulties in interpersonal relationships, adaptation to new situations/environments and problem-solving. Today, many of these individuals face the challenges associated with adulthood in an urban setting. Despite the extensive research developed on children with ASD and ID in the indoor environment, little research has been done on the social participation of adults with ASD and ID within urban settings thus far.

This systematic review aims to shed some light on the activities developed by adults with ASD and ID in an urban context, the main facilitators and obstacles of these activities, as well as the means of transportation used to achieve them.

Like the rest of the population, adults with an ASD or ID engage in various activities related to work, leisure, community life or education, using different modes of transportation, including buses, to perform them. The most important obstacles identified are related to interpersonal relationships along with social and physical environments that are not adapted to their needs. In order to address these obstacles, health professionals, including occupational therapists, have a role to play in the development of methods and tools to increase the abilities of people with an ASD or ID. They can also participate in raising awareness among the population and can advocate for changes in the physical environment in urban settings.

Introduction

Autism Spectrum Disorder (ASD) is a lifelong condition characterised by significant and persistent difficulties in communication and social interaction, but also by restricted, stereotyped, and repetitive patterns of behaviours, activities, and interests (American Psychiatric Association, 2013). This condition frequently manifests itself as sensory hypersensitivity, making them more intolerant to stimuli such as odours and light.

Intellectual disability (ID), on the other hand, is also a permanent condition, but is defined by deficits in intellectual functions such as reasoning, planning and problem-solving. People with ID generally have difficulty adapting to new situations, which translates into difficulties in their autonomy, but also in managing their emotions and behaviour, in their interpersonal relationships, and in risk assessment (American Psychiatric Association, 2013).

In Quebec, the prevalence of ASDs has risen significantly in recent years. Indeed, it was near 1/1000 in 2000-2001 and increased to 4.6/1000 in 2014-2015 (Institut national de santé publique du Québec). Moreover, according to Shattuck, Wagner, Narendorf, Sterzing and Hensley (2011), a growing number of people with ASDs are moving into adulthood and must face the challenges of their new roles without adequate support from society, which generally leads to social isolation (McCollum, LaVesser and Berg, 2016). However, to our knowledge, research on this population is concentrated more into childhood than adults, with very little documentation on adult occupations and their difficulties. Indeed, the impact of this type of environment, which includes the various components of the urban setting such as the road system, public transit, buildings, ubiquitous advertising, lighting and temperature, parks and vegetation, as well as the people living in the environment, is little assessed among this type of population.

Although the prevalence of intellectual disability remains stable at around 10.37/1000 (Maulik, Mascarenhas, Mathers, Dua and Saxena, 2011), population growth, better socio-economic conditions and improved health care leading to increased longevity of this population mean that there is an increase in the number of adults with ID in the population (Cooper, Melville and Morrison, 2004). Like individuals with ASDs, people with ID often have decreased social participation (Verdonschot, De White, Reichrath, Bunthix, & Curfs, 2009).

 We know that the physical environment is responsible for providing positive and negative stimuli, which can have harmful impacts on the daily lives of some individuals. For example, for almost everyone, noise is a pervasive environmental stressor (Smith and Saintfort, 1989) and according to Smith and Saintfort (1989), it is recognised as one of the most important stressors at work. However, some individuals are more sensitive to external stimuli, particularly those with an Autism Spectrum Disorder (Smith & Saintfort, 1989; Ben-Sasson, Hen, Fluss, Cernak, Engel-Yeger, & Gal, 2009) or an intellectual disability (Lundqvist, 2013). Indeed, according to a meta-analysis by Ben-Sasson et al. in 2009, sensory hypersensitivity can interfere with the performance of their daily activities. Such a situation may lead them to avoid certain neighbourhoods, public places, services and businesses available to the general population and thus limit their social participation (Mayer, DiPaolo and Salovey, 1990).

However, some interventions are slowly emerging to help people with ASDs and IDs deal with these challenges. For example, the "structured social planning" type of intervention consists of creating a schedule of social activities with the client that are related to his or her interests in order to encourage participation, but also to train organisational and social skills and to provide peer support (Ashbaugh, 2017). Another type of intervention is video modelling, which involves training individuals to perform an occupation appropriately by having them watch videos created by peers (Hong et al., 2017). This can be used to help individuals with ASDs or IDs learn how to perform a task, particularly for work.

Therefore, given the increase in the number of adults with ASDs and IDs and the lack of research on them in urban settings, it seems important to further

develop the literature on the topic in order to allow these individuals to fully participate in their activities in this environment. This leads us to ask questions such as What are the activities of daily living and leisure that promote social participation among functional adults with ASD and ID in an urban context? And, what means of transportation are most used by functional adults with ASDs or IDs to perform these activities?

Theoretical framework

In order to analyse the articles, the Human Development Model – Disability Creation Process (HDM-DCP) was used (Figure 1). This model documents and explains how different environmental, personal, and lifestyle factors influence a person's daily life (International Network on the Disability Creation Process, 2020).

Figure 1. Human Development Model – Disability Creation Process (HDM-DCP).
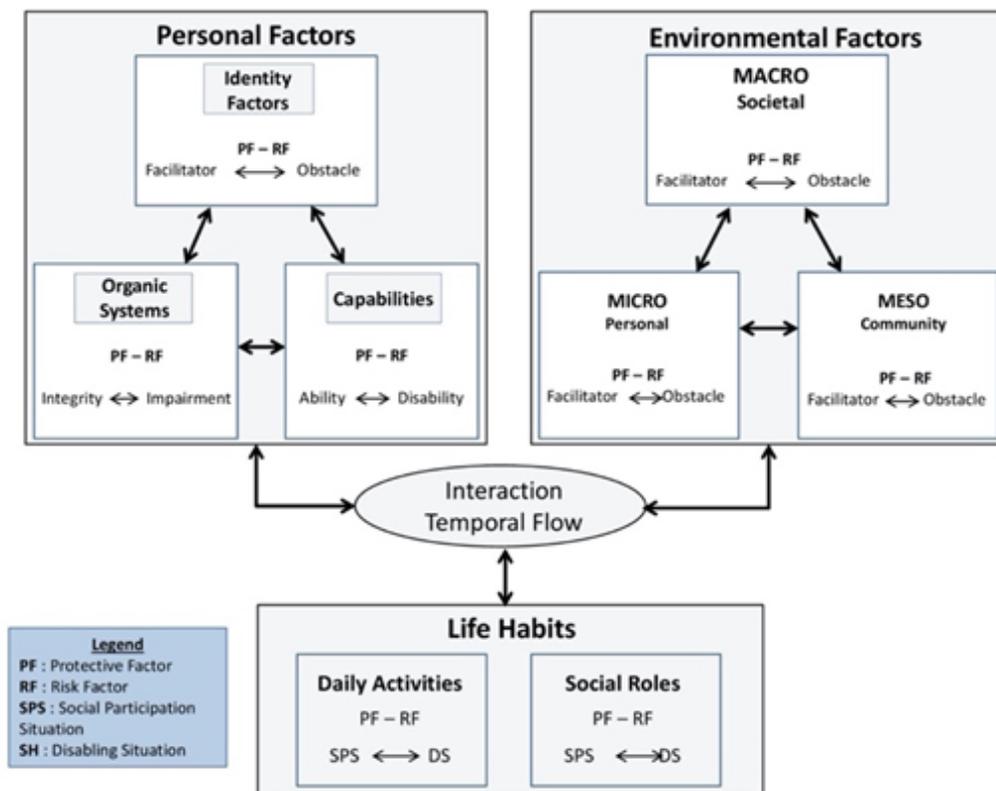
This conceptual model makes it possible to highlight both the protective factors, which therefore help to carry out roles and activities, and the risk factors, which contribute to creating a situation of disability. In this model,

social participation is seen as the result of adequate interaction between personal and environmental factors during a life habit, whereas a situation of disability occurs when these factors are not congruent. Indeed, when there is an interaction between two or more factors that does not work, or works with difficulty, the individual is faced with a problematic situation, an obstacle that may even be impossible to overcome. This model is used in this study to help classify the various information collected in the articles selected in the review.

Methodology

This study follows the guidelines of a systematic review that consists of a comprehensive and rigorous search where the authors agreed on the choice of databases used, the development of inclusion and exclusion criteria, the free vocabulary and thesauri used in the databases, as well as the selection of articles and the analysis of their quality. However, the underlying purpose of this study is more like a scoping review which is an exploration of the main concepts of a field of research and also allows for verification of the type of results available. It summarises the results about a particular field of research and validates the needs of a research project. It does not usually contain a quality study or practice recommendation, however the authors considered pertinent to develop an assessment of the quality of the articles along with general guidelines.

Databases, free vocabularies, thesaurus and search operator

Two databases were selected and six concepts were used (see Table 1) to answer the research question and were accessed on November 30, 2019. The first, PsycNET, is an important source of journal articles in psychology and psychiatry with content useful to many areas of the health sciences. The second is Web of Science, which offers sciences, social sciences, arts and humanities articles and covers multiple databases. It is important to note that there is no thesaurus in this database.

Table 1. Concepts used when searching databases.

Concept	Name
1	Population
2	Urban environment
3	Urban activities
4	Means of transportation
5	Home activities
6	Adult

Thus, for the main question, the concepts "population", "urban environment", "urban activities" and "adults" were used with the Boolean operator "AND" while the concept of "home activities" was added with the operator "NOT" to narrow the scope of the search. In effect, this eliminates articles dealing with social participation at home, which is not covered in the spectrum of this article.

Then, for the sub-question, the concepts "population", "means of transportation" and "adult", with the operator "AND", made it possible to search for articles related to the means of transportation used by adults with ASD/ID when travelling in an urban environment.

Subsequently, the keywords used for the six concepts in the two databases and the thesaurus used in PsycNET are grouped in Table 5 in the appendices.

Inclusion and exclusion criteria

The inclusion criteria reflect the study population, which must have an ASD and/or a functional ID: these adults must be able to perform their Activities of Daily Living (ADLs) and travel to urban areas independently or with minimal assistance. Articles must address social participation and be in English or French.

Articles providing information only about people with ASDs or non-functional IDs who are not able to perform ADLs and go to an urban setting independently or with mild assistance were not included. In contrast, articles that also contained information on a more functional population were not rejected. Articles that addressed individuals with multiple diagnoses were also rejected

in order to avoid including factors that are not related to our study population. In order to address social participation exclusively in an urban context, articles addressing social participation in the home were rejected. Finally, duplicates, abstracts of oral presentations or conferences, research protocols, theses and research papers were rejected.

Selection process

As a result of the selection process, 1278 articles were identified in the research databases. Since 107 of them are duplicates, the selection process by abstract was carried out on 1171 articles to highlight 123 articles that corresponded to the inclusion and exclusion criteria. Of these articles, 17 were retained after the full reading selection process. This is summarised in Figure 2.

Figure 2. The Prisma. Created using Covidence software (www-covidence.org) on August 16, 2020.
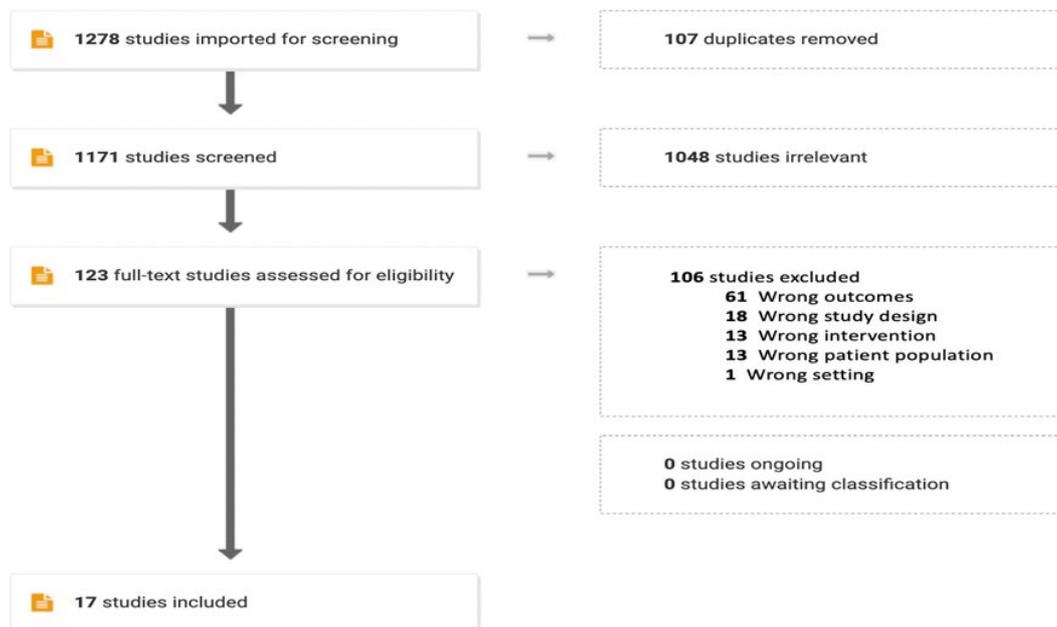
Quality Assessment of the Articles

In order to evaluate the quality of the articles identified, the critical review grid for quantitative articles (Law et al., 1998) and the equivalent version for qualitative articles (critical review grid for qualitative articles) (Letts et al.,

2007) were used. These two grids provide similar ratings allowing a similar analysis of the articles.

The grid for quantitative articles contains 17 criteria addressing the purpose of the study, the literature review, the study design, the sampling, the results (metrological qualities), the intervention, the data analysis, the clinical significance and the conclusion. The grid for qualitative articles contains 20 criteria addressing study purpose, literature review, study design, sampling, data collection, procedural rigour, data analysis (scientific rigour, verifiability, theoretical linkages), metrological quality and conclusion.

The quality of the papers was evaluated by the two authors separately, and then a consensus was reached by argumentation on the divergent points. The authors first evaluated four articles in order to ensure a unanimous understanding of all the items of the grids.

Level of scientific evidence

In order to assess the level of scientific evidence, the 2001 version of the Oxford Centre for Evidence-Based Medicine (CEBM) grid was used (Centre for evidence-based medicine, 2016). The latter allowed for hierarchical classification of articles to highlight those with a higher level of scientific evidence and stronger proof. As in the quality assessment, the level of evidence was analysed by two reviewers and a consensus was reached.

Data extraction method

Data were also extracted by two individuals separately before being pooled in a consensus. The papers were distributed in three different tables according to their population. The first table groups the articles dealing with individuals with an ASD, the second with individuals with ID, while the third contains the articles that include both individuals with an ASD and ID. These extraction tables are based on the components of the HDM-DCP and make it possible to highlight the objective of the study, the lifestyle, environmental and personal factors presented in the articles identified, as well as to group together the quality of the various studies in order to compare them. The following table is an example:

Table 2. Sample Data Extraction Table.

Authors (date)	Title	Purpose of the study and estimate	Methodology	Personal and environmental factors	Life habits	Results	Quality assessment according to Letts and CEBM

Results

Quality Index and CEBM

From this literature review containing 17 articles, a mean overall quality of 68.62% and a median of 66.7% emerged. It should be noted that the quantitative articles had an average and median quality that were about 10% (11.96% and 9.7%, respectively) higher than their qualitative counterparts (Table 6). The two lowest articles are those of Deka, Feeley and Lubin (2016) and Lubin and Feeley (2016) with a score of 50%, while the highest is the article of E. Curry, E. Yerys, Huang and Metzger (2017) with a score of 87.5% followed by Zalewska, Migliore and Butterworth (2016) with a score of 83.3%.

Table 3. Means and medians quality of articles.

Studies Quality	Means (%)	Median (%)
Quantitative Studies	73,27	72,2
Qualitative Studies	61,31	62,5
Overall	68,62	66,7

For the CEBM quotation, out of 17 articles, the majority have a score of 3b (non-consecutive cohort study, or very limited population). The other articles are divided, in order of importance, into the following four ratings: rating 5 (expert opinion without an explicit critical appraisal, or based on physiology, bench research or "first principles"), rating 2c (ecological studies), rating 2b (retrospective cohort study, or poor follow-up) and rating 3a (systematic

review of 3b and better studies) (Table 4). Thus, the strength of the body of evidence according to the CEBM rating is 3b.

Table 4. Number of Articles by CEBM score.

CEBM score	Number of articles	CEBM score	Number of articles
1a	0	2c	2
1b	0	3a	1
1c	0	3b	10
2a	0	4	0
2b	1	5	3

Lifestyles Habits

The diverse lifestyles of people with ASDs and IDs found in the articles fall into five of the HDM-DCP categories: interpersonal relationships, transportation, work, leisure or community life, and education. Therefore, the risk and protective factors have been separated into these categories to better integrate them into their context.

Interpersonal relationships

Some individuals with ASD take public transport to go shopping, work, school or social activities with family and friends (Deka, Feeley & Lubin, 2016). Although feeling understood and accepted is an important factor in employment and good social interaction (Nouf-Latif, Andersson and Markström, 2019), being called "disabled" at work may have a very negative effect on them. For people with ID, leisure and employment are often the main occupations that allow them to have relationships outside the family framework. At work, some develop good relationships because of the time spent on breaks and outside of work, but some have few opportunities to interact with their colleagues since they only work a few hours and therefore do not have a break. In addition, youth with ID feel accepted when they are treated like everyone else in their jobs and people talk to them. (Hall, 2016). Even though some are more introverted and seek less companionship from others, some are able to create a network of friends that allows sharing and emotional support (Randell & Cumella, 2009).

Transportation

In terms of means of transportation, eight articles have addressed this issue among people with ASD, being a challenge for 26% of them (Zalewska, Migliore, & Butterworth, 2016). The most used mode of transportation is "to be a passenger in a family car", "a friend's or a volunteer's car", followed by "walking" and then "public transport", with "driving a car" being the last (Deka et al., 2016). Some report that having a license and a car would increase their freedom to make spontaneous trips (Lubin and Feeley,2016). In addition, although ASDs have more difficulty in areas with traffic, right turns, and yielding due to the need to interact with other drivers, they can compensate for this difficulty through their marked adherence to rules such as the appropriate use of the turn signal (Chee, Lee, Patomella, & Falkmer, 2017). Proper use of this signal can reduce confusion for other drivers and avoid accidents. Stress levels vary among this population concerning car use, and many prefer to use other modes of transportation (Chee et al., 2015). Compared with these modes, people with ASDs would generally be comfortable using public transport, but some prefer to drive or are uncomfortable in crowded conditions (Falkmer et al., 2015). In terms of walking, most people with ASD are as confident as neurotypical individuals (Earl, Falkmer, Girdler, Morris, & Falkmer, 2018) in using pedestrian crossings or shared areas.

Concerning transportation for people with ID, it implies a real challenge for 31% of them (Zalewska et al., 2016). The main forms of transportation used would be "being a passenger in a relative's or friend's car", "paratransit", or "public transit" (Hall, 2016). However, this varies with age. For seniors with ASD or ID, "paratransit" becomes the preferred mode of transportation, followed by "being a passenger in a family member's car or a cab" (McCausland, Stancliffe, McCallion and McCarron, 2019). They would also be less confident than neurotypicals in using pedestrian crosswalks or shared areas.

Work

Three articles sustain that individuals with ASD are often determined to accomplish the goals they have set for themselves, and that personal ambition

is a motivating factor, as for many neurotypical individuals. In addition, 74.5% of people with ASDs would travel to work, while 86.6% would travel to school or a vocational training program (Deka et al., 2016) and independent transportation would significantly increase access to employment (Zalewska et al., 2016). Concerning "work" and individuals with ID, seven articles addressed the high attachment invested to their jobs, as well as the feelings of being lazy and useless when losing a job (Banks, Jahoda, Dagnan, Kemp, & Williams, 2009). In addition, following an employment assistance program, 30% of the first job was in maintenance while 24% was in sales, and 77% of participants changed jobs at least once in two years. (Botuck and Levy, 1998). Most jobs are part-time and are quite varied (such as grocery, store, or respite care), and it may be more difficult for some to find or keep a job (Hall, 2016). Some also volunteer in addition to their jobs. (Hall, 2016). Finally, one article discussed employment for people with ID in an "Intentional Community". These groups of people who have decided to live together according to certain rules vary from each other depending on the intent behind their creation, but they are generally based on mutual support, sharing and community life. Thus, in the community studied, people with ID find that their employment is important in their daily lives and that it is pleasant to be able to change jobs easily (Randell, 2009). Indeed, some mentioned that it was easier to find a new job in that environment if the last one did not suit them, which reduced the stress, boredom, and feeling of uselessness caused by a transition that is too long and marked by employer rejections. (Randell and Cumella, 2009; Banks et al., 2009).

Leisure and community life

People with ASDs are more likely to use transportation to engage in leisure or community activities such as shopping, recreational or social activities, religious services, or family and friends visits (Deka et al., 2016). Concerning individuals with ID, many are involved in structured activities such as sports leagues, unstructured activities such as bowling, and social activities such as dance and art, community events or liturgical activities (Hall, 2016). For some, going shopping is a sign of autonomy of decisions, choices and responsibilities, while providing a certain amount of pleasure and allowing social skills to be practised outside the family group (Wilton, Fudge Schormans and Marquis,

2018). Finally, for people with ID who were part of an "Intentional Community", there were many leisure activities, both at home (such as music or drawing) and outside the home (such as going to coffee, choir, or theater). They mentioned that the feeling of security is very important for them in carrying out these activities. (Randell and Cumella, 2009).

Discussion

In this section, the results of the literature review will be highlighted in order to provide an overview of the lifestyle habits of individuals with ASDs and IDs. Thus, the different lifestyle habits will be explored in order to highlight the main facilitators and barriers that limit the social participation of people with ASDs and IDs. After presenting the difficulties and facilitators encountered for them during their occupations in the urban environment, possible solutions will then be discussed.

The above literature review shows that people with IDs and ASDs experience many types of relationships in their daily lives, ranging from couples, families and friends to work relationships, and this can influence their feelings about their choice of activities, as is the case for the general population (Deka et al., 2016; Hall, 2016; Nouf-Latif et al., 2019,). The fact that these individuals have more difficulty than neurotypicals in understanding the feelings of others, expressing their own feelings and interpreting non-verbal cues (American Psychiatric Association, 2015) can lead to inappropriate social behaviours or misunderstanding by others, and this is one of the greatest barriers they face in carrying out and performing their activities in an urban setting (Deka et al., 2016; Hall, 2016; Nouf-Latif et al., 2019).

The unpredictability of social relationships can also be a source of anxiety for people with ASDs and IDs (American Psychiatric Association, 2015; Autisme Québec, 2020) while making it more difficult for them to perform these activities, diminishing their desire to participate. In addition, difficulties in interpersonal relations have a collateral effect that can affect the completion of urban occupations. Indeed, adolescents and young adults with ASDs or IDs often have less opportunity to learn with or from their peers, some essential knowledge of the proper use of the various systems present in a city. For

example, it is common for young people to explore the city with friends using public transit. This allows them to learn how to locate themselves in the environment, use public transit efficiently and find their way back if they need to. The fact that people with ASDs or IDs have less access to this type of experience may affect their ability to move around the city later on. Another example would be going to restaurants or shopping without parents. Indeed, without them, a young person is forced to interact with the adults who work in these places, which allows him or her to develop autonomy. Thus, doing activities with peers in an urban setting is a frequent means of learning that allows young people to develop their autonomy and face architectural barriers. Unfortunately, this means it is less used among people with ASD or IDs due to their difficulties developing relationships with their peers. Therefore, the impact of the interpersonal barrier is a major obstacle for these populations in their relationships and in their activities in an urban setting, such as their job.

This review of the literature shows that several barriers could influence their ability to have a job, being most striking the need to interact with others. As this can make tasks more difficult because of misunderstandings, inappropriate social behaviour and anxiety caused by social interaction (Deka et al., 2016; Hall, 2016). For example, work that requires numerous group meetings can become anxiety-provoking for people with ASDs and increases the risk of misunderstandings that can lead to frustration among colleagues. Another important challenge was not being able to travel to work independently due to transportation that was not adapted for them, such as a complex bus route requiring multiple transfers (Deka et al., 2016; Lubin et al., 2016;), and a smaller percentage of them having a driver's license (Curry et al., 2017; Deka et al., 2016; Zalewska et al., 2016). Furthermore, Smith et al. (1989) suggest that environmental stimuli such as noise or light can interfere with work performance and well-being. This is all the more pronounced in people with ASDs (Smith et al., 1989; Ben-Sasson et al., 2009) or people with IDs (Lundqvist, 2013) due to their sensory hypersensitivity.

Concerning the facilitators that were found, having a position that is rewarding and feeling accepted in the community greatly helps the integration of people with ASDs or IDs (Nouf-Latif et al., 2019). Also, having access to pre-

service training (Nouf-Latif et al., 2019), a workplace trainer (Hall, 2016), or job-specific education (Nouf-Latif et al., 2019) is also an important aid to obtaining and maintaining employment. Moreover, it is preferable to highlight strengths rather than difficulties when meeting with employers in order to improve their attitude towards people with ASDs or IDs (Nota, Santilli, Ginevra, & Soresi, 2014) and to find a job that is adapted to the person and their strengths, which facilitates integration, productivity, and satisfaction (Hall, 2016). For example, a job that requires little social contact and corresponds to the person's strong interests will make it easier for the person to carry out his or her tasks while increasing the chances of keeping the job in the longer term. Finally, being able to travel independently is also a major asset (Zalewska et al., 2016).

Education is also an important occupation for the well-being of people with ASDs and IDs, and many hope to go on to post-secondary education (Cheri Wallace, 2016). As mentioned previously, difficulties in communication and social interaction, associated perceptual and physical difficulties, and learning disabilities that may be present, can make learning more challenging. According to Cheri Wallace (2016), school is also a way for them to develop their social skills, experiment with new situations and even feel pride in their academic, social or daily life management success. As with students in general, the presence of supportive relationships, whether with family, friends, or teachers, enables individuals with ASDs to remain in the school environment for longer periods of time (Cheri Wallace, 2016).

In relation to leisure activities and individuals with ASD and ID, some barriers are the environmental stimuli (Smith et al., 1989), the social relationships needed to perform the activity (Hall, 2016; Deka et al., 2016; Nouf-Latif et al., 2019), accessible modes of transportation and the ability to use them (Chee et al., 2015, Chee et al., 2017; Deka et al., 2016; Falkmer et al., 2015), along with the choice and cost of available activities. Indeed, according to Bodde et al. (2009), lack of financial resources, support from others, and transportation options were the most recurring factors preventing people with IDs from engaging in physical activity. One example to illustrate this could be having a gym membership which can be quite expensive and require a complex organisation that can be difficult for a person with IDs (such as planning the

different steps - necessary travel, change of clothes, toiletries, etc.-. the use of machines or the relationship with other users). In addition, some people with IDs may have some difficulty managing risk because of impaired judgment and learning difficulties (American Psychiatric Association, 2013). Therefore, their family and friends are often reluctant to allow them to practise this type of activity because of the risk of injury related to the use of machines or sometimes complex training methods. As it happens with everyone else, the support of family members, peers and caregivers often facilitates leisure activities and the rewards that come with some of them (e.g. volunteering) (Hall, 2016; Wilton et al., 2018). The independence these activities provide is also a factor that encourages individuals with ASDs and IDs to persevere and practise their communication skills in this context (Hall, 2016; Wilton et al., 2018).

The second research question addressed the means of transportation and destination that people with ASDs and IDs make in their daily lives. For example, the articles indicated that they typically travelled to work, school, or various leisure or community activities (Deka et al., 2016; Lubin et al., 2016; Zalewska et al., 2016). According to Sherman and Sherman (2013), the lack of accessible and adapted modes of transportation such as buses or subways is one of the barriers that most limit inclusion and social participation in the community. Indeed, despite the presence of public transit, the difficulties associated with IDs or ASD make the system difficult to use for these populations (Deka et al., 2016; Falkmer et al., 2015; Hall, 2016; Lubin et al., 2016; McCausland et al., 2019). For example, long, complex, frequent trips requiring numerous stops and transfers are common. This can be problematic for everyone, but a person with ASDs or IDs faces additional challenges in having relationship difficulties, as they will not tend to seek help when needed and may not know whom to ask for help or how to ask for it (American Psychiatric Association, 2015; Autism Quebec, 2020; Deka et al., 2016; Lubin et al., 2016). In addition, the lack of education regarding the use of public transportation for people with ASDs and IDs also increases the fear of using public transportation (Lubin et al., 2016) and limits their ability to use public transportation due to a lack of practice and knowledge about procedures, how to follow and the meaning of different signs.

Having access to education can make urban travel easier, both in terms of walking and using public transit (Lubin et al., 2016). Access to a driver's licence is also a major asset for people with IDs or ASDs, since it allows them to be more independent in their movements and thus to more easily carry out their desired occupations (Zalewska et al., 2016). For people with ASDs, walking is also a relatively easy mode of transportation despite sensory stimulation, which is sometimes increased. People with ASDs generally feel more confident walking than taking public transit or driving a car (McCaulland et al., 2019). However, this is not always the case for individuals with IDs, since they have more difficulty crossing the street (McCaulland et al., 2019) than neurotypical individuals or individuals with ASDs.

Possible solutions

As a result of this research, several solutions seem to be interesting avenues to facilitate the realisation of occupations in an urban context for people with ASDs or IDs to strengthen interpersonal relationships and promote social participation.

First, in the category of leisure and community life, health professionals could advocate for changes to increase opportunities for people with ASDs and IDs and to facilitate the realisation of those already present in the community. For example, they could plead for greater accessibility to sports activities by encouraging adapted and inclusive sports groups. Architects and designers could contribute with more inclusive recreational environments, such as the use of soundproofing materials that would reduce the risk of noise-related sensory overload or arenas and gyms with adjustable brightness to reduce light-related surcharge. The development of training workshops on social interactions could also help reduce the fear and difficulties encountered during occupations in an urban environment. More specifically, in the school context, a structured social planning intervention (Ashbaugh, 2017) can be used, in collaboration with occupational therapists and specialised educators, to increase the social skills of individuals with ASDs, thereby increasing their quality of life and well-being, as well as their academic performance and the variety of social activities in which they participate (Ashbaugh, 2017; Koegel, Ashbaugh, Koegel & Detar, 2013).

Second, mobilising health professionals and human resources experts to improve work prospects by raising awareness among employers about the skills and contributions that an individual with an ASD or IDs can bring to their business could facilitate job search for these populations. Similarly, raising awareness of the difficulties of social interaction with co-workers would also help facilitate the integration of individuals of these populations. In addition, occupational therapists and social workers could have a role in creating and delivering workshops to support the development of work skills to enhance the abilities of individuals with ASDs and IDs to find and keep jobs more easily, given their knowledge of the strengths and limitations of this population. Indeed, people with ASDs frequently have good levels of concentration, good visual acuity, and a predisposition to be more effective because they prefer to be alone (Sénéchal, Fontaine, Larivée, & Legault, 2019): compared to other workers, they waste less time talking to each other, which increases their productivity (Hurlbutt & Chalmers, 2004). These strengths, coupled with a strong interest in certain fields, which increase their knowledge and motivation on these subjects, make them good candidates for certain jobs or fields, for example, in the video game or software industry. Thus, health professionals could also educate the employers about the benefits of hiring people with ASDs and IDs as part of their work team. This could indeed help to reduce the higher unemployment rate among these populations, as noted in Shattuck et al. (2012)

Third, in relation to travel and transportation, it would be necessary for health professionals to act in collaboration with urban planners and transportation experts at the macroscopic level by advocating for changes in the transport system, including simplifying the complexity of trips and the information regarding the schedules and signalisation for the transfers. This can also be achieved by increasing and organising the number of visual cues providing information at stations or on buses to make it easier for users to understand. As in the workplace, raising awareness among employees and transit users about the social interaction difficulties of some people, such as those with ASDs and IDs, could reduce problematic contacts, thereby increasing the sense of safety and confidence in using this type of transportation. Training also appears as an effective way to make people with ASDs and IDs safer about

using public transit (Deka et al., 2016; Lubin et al., 2016). Therefore, the creation of an educational program on this subject could have positive effect on the urban social participation of these populations. This could provide an opportunity for youth with ASDs and IDs to learn the basics and practice using different types of public transportation with their peers. This type of learning could potentially increase the ability of these youths to be self-sufficient in an urban setting, while practising their ability to interact with others. Similarly, training for driving school staff on the common difficulties faced by people with ASDs and IDs, such as yielding off, and how to teach them how to drive safely and independently, could improve their ability to drive safely and independently.

Limits

The quality index of the articles is variable (between 50% and 87.5%), which may diminish the validity of the results of this study, as are the CEBM score, which were mostly in categories 3a, 3b and 5. Moreover, some studies did not divide their study populations according to disability for all results, which may also cloud some of our conclusions. Indeed, since the present study includes people with high-functioning ASDs and people with mild IDs, having articles in which some participants have more severe disabilities may alter the overall picture of client difficulties.

Conclusion

Despite the limitations of this literature review, it appears from the literature that the main difficulties for people with ASDs or IDs to carry out their occupations in the urban environment come from their relational difficulties and an unsuitable social and physical environment. Thus, to facilitate the performance of their occupations, it is necessary to find ways to improve their social skills in these activities, for example, through training, while improving the environment in which they live, by means such as awareness-raising and changes in visual cues. Health professionals, social workers and architects have an important role in adapting the environment, creating tools or methods that facilitate the activities of these populations, and advocating the

appropriate authorities to increase the occupational opportunities for people with ASDs and IDs.

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Appendices

Table 5. Free Vocabularies and Thesaurus Used.

Concepts	Free vocabulary	Thesaurus (PsycNET)
Population	ASD OR autis* OR asperger* OR "Autism spectrum disorder" OR "Autistic disorder" OR "Aspergers syndrome" OR "intellectual disabilit*" OR "Intellectual Development Disorder" OR "Mental retardation"	{Autism Spectrum Disorders} OR {Intellectual Development Disorder}
Urban environment	Urban areas " Or "Urban environment*" OR city OR Urban OR Town	{Urban Environments}
Urban activities	Activit* OR Work OR "Human activit*" OR Hobb* OR education OR Leisure OR "Leisure time" OR "recreation area*" OR Museum* OR Bank* OR Restaurant* OR cinema OR Park* OR "Shopping center" OR mall OR grocery OR Drugstore	{Active living} OR {hobbies} OR {Leisure time} OR {Recreation} OR {Museums} OR {Banking} OR {Recreation Areas} OR {Shopping Centers}
Means of transportation	Pedestrian* OR Bus OR buses OR car OR "public transport" OR travel OR Transportation	{Public Transportation} OR {Automobiles} OR {Pedestrians}
Home activities	Home OR "Activity of daily living" OR "Daily living activit*" OR house OR hygiene OR dressing	{Activities of Daily Living} OR {Household Management} OR {Hygiene}
Adult	Adult OR "young adult"	{Adult Offspring}

How to cite this article:

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