Review of the dental treatment backlog of people with disabilities in Europe (*)

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ABSTRACT

Aim: The present research aims at reviewing the oral health conditions and treatment needs of people with disabilities in Europe.

Methods: A comprehensive literature search was conducted using Medline and Embase with a timeframe from January 2008 until December 2017. Subsequently, a citation tracking was undertaken. Articles in English, French and Dutch were included.

Results: Forty-two articles were included. A variety of oral health problems and treatment needs was reported. More untreated carious lesions, less restorations, a higher number of extractions and less prosthetic rehabilitations were seen in people with disabilities compared with other individuals without disabilities. The oral hygiene level and the periodontal conditions were poor. Moreover, a higher risk of dental trauma, orthodontic problems and tooth wear were reported.

Discussion: Different determinants contribute to the oral health condition and treatment needs of people with disabilities. These determinants can be inherent in persons with a disability (biological factors), their lifestyle, the environment or the organization of oral health care. A treatment backlog was a common finding in people with disabilities. However, results need to be interpreted with caution because of the variety of people with disabilities included in this literature review. Proposed solutions can be put at the level of daily oral care, through oral health promotion programs and the creation of a supportive environment, but also at the level of dental attendance, facilitating the access to oral health care services and focusing the training of dental students and dentists.

Conclusion: This comprehensive review clearly shows a dental treatment backlog in people with disabilities. Solutions require efforts from the caregivers and dental professionals.

INTRODUCTION

Oral health is an integral part of the global health and is essential to the people's wellbeing.[1-3] In order to develop strategies and interventions to improve oral health in the Flemish part of Belgium, the Flemish Government made an agreement with the Flemish dentist associations and the Ghent University and KU Leuven departments of oral health sciences. The aim of this agreement was to develop preventive strategies, for the Flemish population in general on one hand, and for different groups of vulnerable individuals on the other.

In Flanders, oral health promotion strategies are currently being developed targeting people with low socioeconomic status, frail older persons and people with disabilities. The current review focuses on the latter. In 2012 about 15 percent of the world population had a disability, compared to a similar 16 percent of the Belgian 15-64 population.[4,5]

In order to align Flemish preventive oral health strategies with the actual oral health needs of people with disabilities, an overview of reported oral health problems and treatment needs was prepared. The current study aims at reviewing the oral health condition and treatment needs of people with disabilities in Europe.

MATERIALS AND METHODS

Definition of people with disabilities

In analogy with a previous national pilot study that took place in Belgium in 2014, people with disabilities were defined as "people who cannot take care of their own (oral) health because of a mental, physical or medical condition, irrespective of age".[6] The current review focuses on children and adults with an intellectual or physical disability and people with autism. Since we intended to include only studies about people depending on others for their oral health, we excluded studies about people with a psychological, visual and/or hearing impairment without intellectual disability or studies including hospitalized people.

Search Strategy

A comprehensive literature search was conducted using Medline and Embase. The search queries for both databases are attached as appendix. Since only the recent situation was considered relevant, a timeframe for publication date was set from January 2008 until December 2017.

Subsequently, a selection of relevant papers based on title and abstract, and finally full-text, was undertaken. Only studies performed in Europe and published in English, French or Dutch were included to obtain information as close as possible to the situation in Flanders. Furthermore, a citation tracking via Google Scholar and the consulting of the reference lists of included articles was carried out to obtain a search as broad as possible.

RESULTS

The literature search resulted in 2735 publications in Medline and 965 publications in Embase. After the selection process, 42 studies were included. Children with myotonic dystrophy type 1 and children with disabilities had a higher DMFT (decayed, missing, and filled teeth) than children without disabilities.[7,8] However, in females with Rett syndrome and adults with Prader Willi syndrome, DMFT was lower than in the general population.[9,10] In adolescents with ADHD (Attention-Deficit/Hyperactivity Disorder) and children with disabilities more teeth decay resulted untreated[8,11], while less untreated tooth decay was detected in people with Down syndrome.[12-14] Children with Cerebral Palsy underwent more tooth extractions compared with children in general.[15] Moreover, children, adolescents and adults with a disability showed less dental restorations than the population in general.[8,9,11,15-17]

A higher plaque index was reported in both children and adults with disabilities.[7,17,18] Furthermore, in several groups, except for adults with an autism spectrum disorder, gingival health was worse in people with disabilities.[9-11,19] Studies reported signs of gingivitis in 39 to 70 percent of athletes with intellectual disabilities.[12,20-26] Moreover, in these athletes, signs of gingivitis were significantly correlated with age.[22,25,26]

Compared to the general population, edentulism was seen more often in people with intellectual disabilities.[26,27] However, prosthetic rehabilitation was found less often [27-29], with a prevalence of edentulous people without prosthetic rehabilitation ranging from 18 to 61 percent in people with an intellectual disability.[6,25-27,30]

A history of dental trauma was more frequent in several groups of children with disabilities.[31,32] Moreover, in children with disabilities the consequences of dental trauma remained untreated more often than in children without disabilities.[33] A higher prevalence of tooth wear related to bruxism was noted in children with Down syndrome and females with Rett syndrome.[9,13]

When considering orthodontic characteristics, severe orofacial morphological problems were seen more often in children and adolescents with disabilities.[33] Several subgroups of people with disabilities had a larger number of individuals with an anterior open bite.[9,17,34] In addition, adults with Prader Willi syndrome and children with Down

syndrome suffered from hypodontia more often.[10,35]

DISCUSSION

The aim of this review was to describe the oral health condition and treatment needs of people with disabilities in Europe. Common findings were a higher frequency of diseases, diseases at a more severe stage and a dental treatment backlog in both children and adults with disabilities.

Explanatory Factors

Many determinants contribute to the oral health and treatment needs. According to the model proposed by Lalonde (1974), they can be categorized in biological factors, lifestyle, environment and the organization of the oral health care services.[36]

Biological Factors

The biological factors are characteristics of a person, which are hard to control or change.[36] Cognitive factors influence oral hygiene habits of people with intellectual disabilities (e.g. they do not know why and how to brush their teeth, they forget tooth brushing).[37] Moreover, physical factors, like a lack of coordination, sensory problems or abnormal craniofacial and oral muscle tone, seem to make tooth brushing more challenging.[37] Furthermore, oral health maintenance could be perceived not as a priority issue, because other medical or social issues are considered more important.[37,38]

Antipsychotic, anticonvulsant and anxiolytic medication are known to trigger side effects (e.g. xerostomia, gastroesophageal reflux disease, tongue oedema, tongue spasms, bruxism or gingival hyperplasia).[39,40] Moreover, xerostomia and gastroesophageal reflux disease increase the risk of tooth decay, periodontal diseases and erosion of the tooth surfaces.[39] In addition, gastrointestinal problems influence oral health. Idaira et al. (2008) detected significantly more carious lesions in people with disabilities who ruminate.[41] In people fed by tube, less carious lesions but more calculus were described.[41,42]

Lifestyle

Lifestyle factors can be influenced more easily than biological factors. In children with Down syndrome, compared to children without Down syndrome, no differences in food habits were described by Areias et al. (2011).[13] Significantly less food moments were reported in adults with autism spectrum disorders, children with disabilities and adolescents with disabilities.[19,43] Furthermore, Hennequin et al. (2008) described a lower consumption of sugar drinks in children and adolescents with disabilities.[33]

Considering tooth brushing, 74 to 96 percent of athletes with an intellectual disability reported to brush their teeth at least once a day.[12,21–23,25] However, compared to the population in general, less tooth brushing moments were seen in adults with autism spectrum disorders, children with disabilities and adults with disabilities.[19,43]

Environment

Parents and caregivers are most often the oral care providers to people with disabilities. However, Klingberg and Hallberg (2012) described that, in the context of the oral cavity, parents tended to focus more on communication and feeding problems than on tooth decay and periodontal problems. They also felt unsure about delivering oral care to their child with a disability.[38]

Similarly, Chadwick et al. (2018) described that caregivers felt uncertain when carrying out oral care (e.g. when gums bleed).[37] Moreover, they could face uncooperative behaviours, like hitting or biting [37,44,45], which might create barriers to provide oral care. These barriers partly explain why, despite the necessity of help and assistance in tooth brushing, help to people with disabilities is not always provided when needed.[20,46-48]

Organization of oral health care services

The final explanatory factor lies in the management of oral health care services. In addition to daily oral care, dental visits contribute to obtain and maintain oral health. However, people with disabilities face barriers to visit the dentist (**Table 1**). The other way round, barriers and concerns about dental treatment of people with disabilities are also mentioned by dentists (**Table 2**).

In the Greek study of Gizani et al. (2014), more than 90 percent of the dentists mentioned that dental treatment of people with disabilities was difficult but rewarding.[49] Nevertheless, Marks et al. (2012) described that 86 percent of the Flemish and Dutch dentists had emotional concerns when they treated people with disabilities.[50]

Treatment options in people with disabilities can be limited, which has been demonstrated in literature. Children, adolescents and adults with a disability receive less dental restorations than the population in general.[8,9,11,15-17,51,52] Dziwak et al. (2017) reported less use of dental sealants in German children with disabilities.[8]

Table 1. Barriers to professional dental care mentioned by people with disabilities

Accessibility and architecture[29,64,75,76]
Costs of treatment and/or lack of reimbursement[75-77]
Distance and difficulties with transport[72,75]
Fear[29,76,78]
Little availability dentists[29,64,72,75,76]
Long waiting list[64,72,75]
Missing the appointment[19]
No perceived need (e.g. no pain)[76]
Physical disability or non-cooperation[76,79]
Uncertain treatment is possible[75]

Table 2. Barriers to professional dental care mentioned by dentists

Accessibility and equipment[44,49,73]
Concerns about durability of treatment[73]
Concerns about medical history[73]
Extra staff needed[73]
Extra time needed[80]
Lack of communication[38,44,49,73]
Lack of experience[38]
Lack of financial support[44,49,73]
Lack of knowledge and training[38,44,49]
Lack of treatment options[44,73]
Non-cooperation[33,38,44,46,80]

Importantly, Bissar et al. (2010) showed a lower DMFT in young German athletes with an intellectual disability when they had at least one dental sealant.[20] In Belgium, less dental radiographs, less orthodontic evaluation and treatments, and less endodontic treatments were registered in people with disabilities. Consequently, more emergency treatments were seen in both children and adults with disabilities compared to the general population.[51,52]

Limitations

The current results need to be interpreted with caution. Due to a broad definition of people with disabilities, a variety of disabilities and impairments were included in this literature review. Furthermore, the studied populations were mostly small and did not represent all age groups. Moreover, since a variety of measuring tools was used, comparison of the results from different studies was challenging.

Despite these limitations, this review illustrates the dental treatment needs and treatment backlog of people with disabilities in Europe. In addition, the findings are confirmed in literature from outside Europe.[53-61]

PROPOSED SOLUTIONS

Daily oral care

To improve the oral health of people with disabilities, both the daily oral care and the professional dental care should be ameliorated. Oral health promotion interventions, targeting people with disabilities, their family and caregivers, are indispensable to improve daily oral care. Furthermore, a supportive environment is essential to convert acquired knowledge and skills into good practices and attitudes.[37,53-56,58,62-65] Oral hygiene should be individualized by the adaptation of materials (e.g. choice of toothbrush or toothpaste) and tooth brushing should be incorporated in the daily routine of the person with a disability.[37,66,67] A customized use of fluoride can help to achieve and maintain the desired oral health level.

Dental visit

Dentists should be encouraged to treat people with disabilities. Therefore, (general) dentists should be trained to make them feel more comfortable in treating people with disabilities. Both undergraduate and specialized postgraduate courses are necessary, including education on the following issues: impact of disabilities on oral

health; barriers for people with disabilities (for daily and professional oral and dental care); clinical decision making and treatment options; communication with people with disabilities.[49,50,68-73] General dentists should be able to treat people with mild to moderate intellectual disabilities, whereas specialist care should be reserved to more severe cases.

Dentists should receive more financial support when treating people with disabilities and they should be encouraged to make their offices more accessible to disabled people. Finally, a network of dentists should be established, including referral pathways from primary to specialist care. The network should be based on a foundation of general dentists [70,72], and people with disabilities should be informed about this network and how it works.

Ethical dilemma?

The described treatment backlog in people with disabilities can clearly be considered unethical. There is a need for solutions and people with disabilities need support and assistance in maintaining their oral health. However, providing this support and assistance might cross the borders of respecting the patient's autonomy. After all, the possibility of making choices should not be denied to people with disabilities.[74]

Therefore, one should strive for a balance between the theoretically known needs and those perceived by people with disabilities. People with disabilities can be guided in making healthy choices, for example by creating a supportive environment. Moreover, people with disabilities can participate in the decision making process of implementing oral health strategies, which empowers their autonomy. Ultimately, this will align oral health interventions with their needs in order to make the interventions more durable and sustainable.

CONCLUSION

This comprehensive review clearly demonstrates a dental treatment backlog in people with disabilities. Efforts from caregivers and dental professionals are required, based on appropriate training and education.

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APPENDIX

Medline (via PubMed – "all fields"):

("Autism" OR "Behavior disorder" OR "Cognitive dysfunction" OR "Cognitive dysfunction"[MeSH Terms] OR "Dental care for disabled" OR "Dental care for disabled"[MeSH Terms] OR "Disability" OR "Disabled person" OR "Disabled persons"[MeSH Terms] OR "Learning disorder" OR "Mental deficiency" OR "Mental infantilism" OR "Neurodevelopmental disorders" OR "Neurodevelopmental disorders"[MeSH Terms] OR "Thought disorder") AND ("Dental health behavior" OR "Dental health care" OR "Dental health education" OR "Dental health motivation" OR "Dental health promotion" OR "Dental health services" OR "Dental health services"[MeSH Terms] OR "Dental prevention" OR ("Health behavior" AND ("Dentistry" OR "Dental health")) OR (("Health behavior" OR "Health behavior"[MeSH Terms]) AND (("Dentistry" OR "Dentistry"[MeSH Terms]) OR ("Oral health" OR "Oral health"[MeSH Terms]))) OR ("Health promotion" AND ("Dentistry" OR "Dental health")) OR (("Health promotion" OR "Health promotion"[MeSH Terms]) AND (("Dentistry" OR "Dentistry"[MeSH Terms]) OR ("Oral health" OR "Oral health"[MeSH Terms]))) OR "Health education, dental" OR "Health education, dental"[MeSH Terms] OR "Oral health behavior" OR "Oral health care" OR "Oral health education" OR "Oral health motivation" OR "Oral health promotion" OR "Oral health services" OR "Mouth hygiene" OR ("Motivation" AND ("Dentistry" OR "Dental health")) OR (("Motivation" OR "Motivation"[MeSH Terms]) AND (("Dentistry" OR "Dentistry"[MeSH Terms]) OR ("Oral health" OR "Oral health"[MeSH Terms]))) OR "Preventive dentistry" OR "Preventive dentistry"[MeSH Terms] OR "Public health dentistry" OR "Public health dentistry"[MeSH Terms] OR ("Public health service" AND ("Dentistry" OR "Dental health")) OR "Dental determinants" OR "Dental disease assessment" OR "Dental health" OR "Dental health literacy" OR "Dental health surveys" OR "Dental health surveys"[MeSH Terms] OR "Determinants, dental" OR "Determinants, oral" OR ("Epidemiology" AND ("Dentistry" OR "Dental health")) OR (("Epidemiology" OR "Epidemiology"[MeSH Terms]) AND (("Dentistry" OR "Dentistry"[MeSH Terms]) OR ("Oral health" OR "Oral health"[MeSH Terms]))) OR "Mouth disease" OR "Need for dental care" OR "Need for oral care" OR "Oral health determinants" OR "Oral health" OR "Oral health"[MeSH Terms] OR "Oral health literacy" OR "Stomatognathic Diseases" OR "Stomatognathic Diseases"[MeSH Terms])

Embase ("all fields"):

('Autism' OR 'Behavior disorder' OR 'Disability' OR 'Disabled person' OR 'Learning disorder' OR 'Mental deficiency' OR 'Mental infantilism' OR 'Thought disorder') AND ('Dental health behavior' OR 'Dental health care' OR 'Dental health education' OR 'Dental health motivation' OR 'Dental health promotion' OR 'Dental prevention' OR ('Health behavior' AND ('Dentistry' OR 'Dental health')) OR ('Health promotion' AND ('Dentistry' OR 'Dental health')) OR 'Oral health behavior' OR 'Oral health care' OR 'Oral health education' OR 'Oral health motivation' OR 'Oral health promotion' OR 'Oral health services' OR 'Mouth hygiene' OR ('Motivation' AND ('Dentistry' OR 'Dental health')) OR ('Public health service' AND ('Dentistry' OR 'Dental health')) OR 'Dental determinants' OR 'Dental disease assessment' OR 'Dental health' OR 'Dental health literacy' OR 'Determinants, dental' OR 'Determinants, oral' OR ('Epidemiology' AND ('Dentistry' OR 'Dental health')) OR 'Mouth disease' OR 'Need for dental care' OR 'Need for oral care' OR 'Oral health determinants' OR 'Oral health literacy')