

ORIGINAL ARTICLE



Factors influencing the oral health behaviour of Dutch adolescents with mild to borderline intellectual disabilities living in residential care: A qualitative study

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Abstract

Background: Toothbrushing, limiting intake frequency, and scheduled visits to an oral healthcare professional (OHP) are key for good oral health. We aimed to explore factors influencing these oral health behaviours in Dutch adolescents with mild to borderline intellectual disabilities (MBID) in residential care.

Method: Using a qualitative, descriptive approach, we conducted focus groups and interviews with 12 adolescents, 9 counsellors, and 6 OHPs. Thematic analysis mapped factors influencing adolescents' knowledge, attitude, planning, and execution of oral health behaviours to oral care stakeholders.

Results: Of nine identified influencing factors, three were pivotal: Structure (influencing toothbrushing and intake frequency), Anxiety (impeding dental visits), and Support (provided by counsellors).

Conclusions: Counsellors should provide structured daily guidance on oral hygiene and diet for adolescents with MBID, while respecting the adolescents' autonomy. As intermediaries between adolescents and OHPs, counsellors are key in reducing dental anxiety. Counsellors need clear oral health policies within care facilities to address competing priorities.

KEYWORDS

adolescents, behaviour, mild to borderline intellectual disability, oral health, qualitative research

1 | INTRODUCTION

Oral health is important for well-being (WHO, 2022). The two main oral diseases—caries (tooth decay) and periodontitis (gum disease)—cause pain and bad breath. If left untreated, they may also lead to tooth loss, reduced masticatory function and poorer nutritional status, as well as low self-esteem, low quality of life, and negative general health impacts (Chapple et al., 2017; Kim et al., 2013). Caries and

periodontitis are both multifactorial diseases, an important role in their development being played by fermentable carbohydrates and the presence of dental plaque (the biofilm on the teeth) (Chapple et al., 2017; Valm, 2019). Their prevention thus relies heavily on adherence to key oral-health-promoting behaviours: removing dental plaque by twice-daily toothbrushing, and limiting the intake of fermentable carbohydrates, that is, sugars, and starch. Such limits apply both to foods and beverages and they also involve the number of

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intakes per day (Peres et al., 2019). In addition, preventive and restorative dental care should be provided in scheduled visits to an oral healthcare professional.

Adolescence, the transition from childhood to adulthood, is marked by increasing autonomy and personal responsibility in all areas of life, including oral health (Gan et al., 2008). Dental healthcare is important during adolescence, as unmet dental needs are a risk factor for poor health outcomes later in life (Ghafari et al., 2019). Of particular concern in this respect is the oral health of adolescents with mild to borderline intellectual disabilities (MBID), an umbrella term for mild intellectual disabilities (IQ 50–70) or borderline intellectual functioning (IQ 70–85 and problems in adaptive behaviour) (De Beer, 2016) (see Box 1). For these adolescents, the transition to adulthood can be especially difficult: in order to develop the skills and abilities they require to take responsibility for their future oral health, they need more time, support, and supervision than their peers in the general population (De Beer, 2016). Research has also shown that people with intellectual disabilities have limitations in health literacy that affect their access to information and limit their health-related knowledge (Geukes et al., 2019). In addition, MBID are often undiagnosed (Nouwens et al., 2017), thus representing greater potential risks in terms of poor oral health and poor access to the relevant dental services (Wieland & Zitman, 2016). In view not only of adults' responsibilities within the Dutch dental healthcare system (see Box 1), but also of the oral health issues and financial burdens that can result from unmet dental preventive and restorative needs in adolescence, it is pertinent to ask whether Dutch adolescents with MBID have poorer oral health and poorer oral health behaviour than their peers in the general population.

In 2017 a national epidemiological survey on the oral health of Dutch adolescents was conducted (Schuller et al., 2018). To fill the knowledge gap for Dutch adolescents with MBID, a sub-survey was developed with quantitative and qualitative design aspects. The quantitative part, the results of which were published in 2020 (Vermaire et al., 2020) was intended to establish whether Dutch adolescents with MBID differed from other adolescents with regard to oral health and oral health behaviour. Consisting of an oral health check and a quantitative self-report questionnaire, it found that this group did indeed have poorer oral health: a higher caries experience and poorer oral hygiene. Those in residential care also had more microcavities (i.e., possible future cavities needing restorative dental treatment) than those who lived at home with their parents. And although analysis of the quantitative self-report questionnaires showed that adolescents in the general population and those with MBID did not differ with regard to toothbrushing frequency and the number of between-meal snacks, adolescents with MBID indicated that they ate snacks at night significantly more often. They also reported higher levels of dental anxiety and less frequent dental visits. The quantitative part of the sub-survey concluded that regular oral health interventions do not reach this group sufficiently and that targeted interventions are needed.

The overall purpose of the present qualitative part of the sub-survey was to gain insight into the barriers and facilitators influencing

Box 1 Background information

DESCRIPTION OF THE DISABILITY

We defined mild to borderline intellectual disabilities (MBID) as an umbrella term for mild intellectual disabilities (IQ 50–70) or borderline intellectual functioning (IQ 70–85 and problems in adaptive behaviour) (De Beer, 2016).

According to the American Association on Intellectual and Developmental Disabilities (Schalock et al., 2010), a mild intellectual disability (MID) is characterised by significant limitations both in intellectual functioning (i.e., an IQ-score that falls between 50/55–70) and in adaptive behaviour.

In clinical practice in the Netherlands, MID also refers to individuals with an IQ between 70 and 85, provided they have significant limitations in adaptive behaviour, particularly in the area of social adjustment and social life skills. These individuals also have access to care intended for people with intellectual disabilities (de Wit et al., 2012).

DENTAL HEALTHCARE SYSTEM IN THE NETHERLANDS

Healthcare in the Netherlands is organised by law via a compulsory general health insurance. Dental health care is provided by private dentists and hygienists. Preventive and restorative dental care for children and adolescents up to 18 years of age is fully covered by the compulsory health insurance. For adults dental care is based on fee for service. It is optional to purchase a dental insurance to cover (in part) the expenses on dental care.

In cases where a disability interferes with dental care, dentists may refer patients to a Center for Special Dental Care. These centres have a multidisciplinary approach, with specialised oral health professionals and psychologists. Special Dental Care is covered by the general compulsory health insurance. Treatment in these clinics is subject to approval by the insurance company and sometimes an additional fee from the patient is required.

these adolescents' oral health behaviour. Such insights may serve as input for targeted oral health interventions, thus helping oral healthcare professionals (OHPs) to reach this group, and to customise preventive and restorative interventions to their needs. Similarly, it may help teachers, educators in public healthcare, and other stakeholders to get the preventive message across.

The specific objectives of the present qualitative part of the sub-survey, which was conducted among adolescents with MBID living in residential care, were to identify the factors influencing these

adolescents' knowledge, attitude and behaviour regarding the following three oral health behaviours:

1. Toothbrushing twice daily.
2. A maximum of seven food or drink intakes per day.
3. Scheduled visits to a dental practice.

2 | METHODS

2.1 | Ethical approval

This study presents the qualitative aspects of a sub-survey within a wider national epidemiological survey on the oral health of Dutch adolescents (Schuller et al., 2018). The full project received ethical approval from the Central Committee on Research Involving Human Subjects (CCMO) (Approval No. m1556571). It was determined that the study did not fall under the provisions of the Medical Research Involving Human Subjects Act, and also that it met all the requirements of the Personal Data Protection Act. Informed consent was obtained from all participants before their participation in the study. Participants were assured of confidentiality and were informed that they could withdraw from the study at any time without penalty.

2.2 | Study population background

This study focused on adolescents with MBID living in residential care in the Netherlands. Adolescents in such facilities live in group homes, supported and supervised by counsellors (sometimes also termed 'support workers') with social-pedagogical training.

2.3 | Design

This sub-survey part was developed as a qualitative, descriptive design to explore and describe the factors influencing the oral health behaviour of adolescents with MBID living in residential care. It was decided that an open-ended inquiry would give respondents more opportunities to elaborate on their answers than the questionnaire-based self-report in the quantitative part of the study. In the same way, it was decided that focus-group discussions might generate the kind of momentum that allows underlying opinions, meanings, attitudes, and beliefs to emerge alongside descriptions of individual experiences (Doyle, 2009; Parker & Tritter, 2006). To provide triangulation of the data information was gathered from three perspectives: that of the adolescents, that of counsellors working with them, and that of OHPs working in special dental care. With an eye towards the development of future oral health interventions for adolescents with MBID, it was determined *a priori* to focus on their knowledge, attitudes and behaviours regarding the three oral health behaviours, being basic topics for behaviour change. In addition, it was decided

that the influencing factors we aimed to extract, should be organised by relating them to the relevant stakeholders in the oral care process.

To ensure quality in the reporting of this study, we used the consolidated criteria for reporting qualitative research (COREQ) checklist (Data S1) (Tong et al., 2007).

2.4 | Recruitment

Adolescents with MBID were recruited from a residential care facility that had also participated in the quantitative part of the sub-survey. There were two eligibility criteria: a diagnosis of mild to borderline intellectual disability, and age between 16 and 18 years. Both criteria were confirmed by the residential care centre. The manager selected eligible individuals, whose counsellors then informed them personally about (1) the aim of the study and (2) what would be expected of them if they decided to participate. As an incentive, adolescent-participants in the focus-group sessions received a €10 voucher. Counsellors were recruited through the same manager. Those working with adolescents with MBID were informed about the aims of the study and were invited to participate in individual interviews during working hours. OHPs were informed and recruited through VMBZ, a Dutch association of oral healthcare professionals working in special dental care. Those who had work experience with people with MBID were invited to participate in a focus-group interview. In total 12 adolescents, 9 counsellors and 6 OHPs—4 dentists and 2 dental hygienists—participated in the study. All participants provided written informed consent.

2.5 | Data collection

To ensure that data collection covered the adolescents' knowledge, attitudes and behaviour relevant to the three key oral health behaviours, three semi-structured interview guides were developed.

The interview guide that was intended for the focus groups with adolescents was supported by visual aids. To ensure a good fit with their language and experiences, it described the topics in terms of real-life situations (van der Molen et al., 2007). An English translation of the topics and questions is shown in Table 1; the Dutch version of the interview guide is available on request. As 12 adolescents were included, there were two focus-group interviews, each involving six participants. Both of these interviews were conducted in a quiet room at the residential care centre; they lasted for ~60 min. They were guided by a psychologist with extensive work experience in the care of people with disabilities (HA), who also moderated the discussions. The supporting media were operated by the assistant moderator (RvZ), who also ensured that all participants contributed to the discussion.

The other two guides were intended for the interviews with the counsellors and the focus group with the OHPs, and consisted of open-ended questions. Nine counsellors were interviewed individually or in pairs in a total of seven interview sessions. Each interview was

TABLE 1 Interview protocol for the focus groups with adolescents with mild to borderline intellectual disabilities, translated version.

Topics	Questions
Welcome and introduction	
Topic: toothbrushing twice daily	Who did brush his/her teeth this morning? Is someone keeping an eye on whether you brush or not? Do you think toothbrushing is important?
This is Anna. 1. She is 17 years old and goes to high school in Enschede. 2. She got up this morning, ate bread and went to school. 3. She forgot to brush her teeth.	Do you sometimes forget to brush your teeth too?
Thomas is 16 years old. 1. He is in class 4 of high school. 2. Tonight he spent until 11 PM gaming. 3. Now he doesn't feel like brushing his teeth	Do you also sometimes don't feel like brushing your teeth
Topic: a maximum of seven food or drink intakes per day	
Sofie is 16 years old. 1. This morning Sofie ate breakfast, bread in the afternoon and ate pasta in the evening. 2. In between she ate an apple and a chocolate bar. 3. In the evening, she ate a bag of chips.	What do you eat in between meals?
Alper is 18 years old. 1. This morning he drank a glass of milk. 2. In between meals, he drank two glasses of lemonade. 3. In the evening he drank two glasses of coke.	What do you drink in between meals?
Topic: Scheduled visits to a dental practice.	
Inge is 17 years old. 1. She has a dental appointment at 1 PM 2. At 1 PM she is still busy with her homework. 3. That is why she forgot the appointment with the dentist.	Do you sometimes forget your dental appointment too?
Tom is 16 years old. 1. He went to the dentist today. 2. The dentist told him many things. 3. This makes him feel like not going there anymore.	Does this also happen to you, at the dentists'?
This is Sanne. 1. She is 18 years old. 2. She has to go to the dentist, but she is scared.	Are you also (sometimes) afraid of the dentist?
Topic: How to get information about oral health	
Information about your health.	1. If you want to know something about your health. Where do you look it up? 2. Would you like more information about brushing your teeth? 3. Where would you like to hear about it? 4. Where would you like to read about this?
Thank you!	

Note: The Dutch version in Powerpoint, including pictures, is available on request.

conducted by the same author (RvZ) and lasted for an average of 25 min. Six OHPs participated in a single focus-group interview. This was held in a conference room in a central location in the Netherlands, was conducted by two authors (RvZ, DS), and lasted about 90 min. All interviews were conducted between June 2018 and March 2019. They were audio-recorded and transcribed verbatim, using A for adolescent, C for counsellor, and OHP for oral healthcare professional, to guarantee anonymity. The recordings, transcripts, and other supporting data were stored digitally in a database at the Netherlands Organisation for Applied Scientific Research (TNO), Leiden, the Netherlands that was accessible only to the authors.

2.6 | Data analysis

Interview transcripts were analysed and interpreted in accordance with the principles of thematic content analysis (Green & Thorogood, 2018). Three authors (SKS, DSA, RvZ) familiarised themselves with the raw data. They followed a deductive approach to extract the barriers to and facilitators of the adolescents' knowledge, attitude and behaviour regarding toothbrushing twice-daily, a maximum of seven food or drink intakes per day, and scheduled visits to a dental practice. Staying close to the data, an inductive approach was then used to group the barriers and facilitators as indicated by the participants into influencing factors,

and link these to the relevant stakeholders in the oral care process. This procedure involved discussions and adjustments by the team of authors, consisting of experts in the fields of oral health, research and psychology, until consensus was reached.

3 | RESULTS

In this section we start with presenting the data regarding the knowledge of the adolescents about oral health behaviours (Section 3.1), followed by the data on their attitude, planning and execution of toothbrushing twice daily (Section 3.2), a maximum of seven food or drink intakes per day (Section 3.3), and scheduled visits to a dental practice (Section 3.4). Out of a variety of barriers to and facilitators of the adolescents' oral health behaviours, we identified nine influencing factors (See Box 2), and related them to the relevant stakeholders in the oral care process. The matrix in Table 2 clarifies the procedure of analysis. The nine identified factors influenced the oral health behaviours of the adolescents in multiple aspects and were also related to each other. We describe these relationships by examining the three major factors, Structure, Anxiety and Support, in Section 3.5.

Where participants' remarks are cited in the results, A stands for adolescent, C for counsellor, and OHP for oral healthcare professional. All citations were translated by a professional interpreter.

3.1 | Knowledge of oral health behaviours: The difficulty of conveying complex information

The concepts of toothbrushing twice daily and scheduled visits to a dental practice were known to the adolescents as social norms. The recommendation of a maximum of seven food or drink intakes per day appeared to be complex. Adolescents interpreted it in various ways: When one said *Like cola is also bad. You can even clean a car with it*, another adolescent responded, *Then it's going to clean your teeth and everything inside, too—right?* The counsellors indicated that the

adolescents knew little about healthy eating and drinking habits. C: *They know you can get fat from it, but that's where their knowledge ends.* In addition, OHPs admitted to have difficulties in conveying the complex idea of a maximum of seven daily eating and drinking occasions. They also indicated the confusion that might arise if dieticians and OHPs gave conflicting advice on the frequency of eating, as dieticians regularly recommend eating frequent small portions. In the OHPs' view, this should be better coordinated within the care facility.

Regarding the individual transfer of knowledge, taking place during oral hygiene instructions at the dental practice, the adolescents indicated that the attitude and tone of the OHP were important factors in getting the message across. First and foremost, OHPs should be kind. OHPs indicated that, in spite of their positive approach, the adolescents sometimes experienced their advice as criticism. They therefore strove to take a positive approach, which was sometimes difficult. As one OHP put it: *It's not always easy. I look in the mouth, and then wonder what I can possibly say that's positive about it.*

The important role of counsellors emerged, as intermediates between adolescent and OHP, during oral hygiene instructions and as providers of oral health information in the home-situation. Counsellors saw themselves as appropriate sources for communicating information to the adolescents because they 'speak their language'. They suggested that information about oral health behaviours should be included in the weekly educational hour scheduled for personal care. Another suggestion was to 'give information during the activity itself', which a counsellor explained as follows: *At a fixed time, we could brush our teeth as a group. Conversations would arise from this, which is when we could give information.*

General education about oral health behaviour appeared not to reach the adolescents. When asked, they reported that the internet and leaflets were their sources of information about oral health. However, they admitted to not reading leaflets and said they knew that not everything they read on the internet was true. OHPs stressed the lack of suitable oral health education materials for this target group. They did not consider leaflets targeting people with intellectual disabilities to be appropriate, as these focused on caregivers who performed the brushing for their clients. Similarly, standard leaflets were too complicated and contained too much text. The OHPs suggested that a leaflet should be created that helped counsellors convey the information in a way that was appropriate for the adolescents. The OHPs also felt that young people's education and counsellors' training should both include a greater focus on oral health. In addition, the usefulness and necessity of dental visits should be disseminated through channels other than the dental practice—for example through lessons at school or via social media.

3.2 | Toothbrushing twice-daily

3.2.1 | Attitudes: Appearance as a strong motivator

When discussing the importance of brushing, the adolescents predominantly expressed a fear of being dirty or ugly, surfacing

Box 2 Results: Factors influencing oral health behaviour

1. MBID characteristics
2. Childhood experiences
3. Anxiety
4. Support
5. Structure
6. Competing priorities
7. Characteristics and abilities of OHP
8. Policies within care facility
9. Education

TABLE 2 Matrix showing the analysis of barriers and facilitators of the three assessed oral health-related behaviours into nine factors influencing the oral-health related behaviour of adolescents with MBID.

Oral health related behaviour	Influencing factors Topics	Stakeholders			
		Adolescent with mild to borderline intellectual disabilities (MBID)	Counsellors	Oral healthcare professionals (OHPs)	Polymakers
		MBID characteristics ^a Childhood experiences Anxiety	Support ^b Structure Competing priorities	Characteristics and abilities of OHP ^c	Policies within the care facility Education
Tooth brushing twice daily	Knowledge	Concept is known; not overseeing long-term consequences of not brushing; parents may also have an intellectual disability; advice experienced as criticism	Education by staff at the time of brushing; oral health education leaflet for counsellors of youth with mild to borderline intellectual disabilities	Oral hygiene instructions in a friendly tone	Oral health education at school; educational leaflets targeted to adolescents with mild to borderline intellectual disabilities
	Attitude	Intrinsic motivation; motivated by appearance; parents having bad teeth; support and supervision considered as 'infantilizing'	Extrinsic motivation; attitude of counsellors themselves	Supportive attitude; motivational interviewing	
	Planning and execution	Planning issues; lack of focus; habitual behaviour, learned from parents: 'it has to be in your system'. Brushing strategies: 'What works for one, may not for another'	Reminders by counsellors; counsellors being there when adolescent brushes teeth; counsellors as role model; brushing as group activity; competing priorities of counsellors	Positive reinforcement during toothbrushing instructions	Policy within residential care facility
Maximum of seven food or drink intakes per day	Knowledge	Complex information, misinterpreted; difficulties in reading and understanding written information		Difficulties in explaining complex information	Coordination of advices with other healthcare professionals (dieticians)
	Attitude planning and execution	Limitations in self-regulation; focus on food	House rules; structured daily schedule; monitoring by counsellors; counsellors as role model		Policy within residential care facility
Scheduled visits to an OHP	Knowledge	Concept is known		Inform about special dental care	Education about special dental care
	Attitude	Anxiety; discrepancy between emotional development and calendar age; breaking the normal daily routine; earlier experiences in general dental practice		Recognition of the MBID; overestimation of the coping skills; supportive attitude; bond of trust	
	Planning and execution	Overestimation of own planning skills; earlier experiences with OHPs; anxiety	Planning and reminders by counsellors; counsellors accompanying adolescent to OHP; Information processing with adolescent after visit to OHP	Bond of trust; customised explanation and anxiety management; management of disability related behaviour	Policy within residential care facility

Note: Barriers and facilitators as indicated by the participants are presented by topic: the knowledge, attitude, planning, and execution of the three assessed oral health-related behaviours. The nine influencing factors are related to the relevant stakeholders in the oral care process.

^aMBID Characteristics: Limitations in executive functions (i.e., structure in planning and focus, cause-effect-thinking, impulse control, cognition); a disharmonic developmental profile; limitations in health literacy.

^bSupport in all areas of oral health behaviour, including the provision of tailored education.

^cCommunication was key for creating a bond of trust, and for customised explanation and anxiety management.

'appearance' as a strong motivator. A: *Not brushing is dirty; your teeth will look ugly and you will smell bad.* Another adolescent considered brushing to be important because his mother had acknowledged not having brushed properly herself and now had ugly teeth. However, other adolescents showed less interest. A: *It doesn't bother me that much.* Appearance as the most important reason for the adolescents to brush was confirmed by the counsellors. They explained that, due to their disability, it is hard for the adolescents to foresee the long-term consequences of not brushing.

Counsellors and OHPs indicated that one reason adolescents did not brush lay in a lack of intrinsic motivation. One counsellor named extrinsic motivational factors for brushing: C: *I think with the adolescents, it's mainly something like 'Oh, OK—if you really want me to'.*

OHPs reported that they tried to motivate adolescents to brush twice a day by using motivational interviewing. They also gave practical advice, such as linking brushing to an activity that was part of the daily schedule, for example taking a shower or putting on pyjamas.

3.2.2 | Planning: "It has to be in your system"

Although some adolescents said that they never forgot to brush their teeth, most indicated that they failed to do so at least once a week. They thought that this also applied to their peers. They gave various reasons, such as forgetting (mostly during weekends when the normal daily routine was interrupted); lack of time (in the morning before going to school or work); lack of desire (in the evening after watching TV in bed); or lack of interest. One adolescent said, *I'm not that concerned with whether I brush my teeth or not'. But, overall, they agreed that brushing should be 'in your system', which they explained as follows: It's not in your system. It's not that you're unwilling to do it—you do want to do it, but it's not in your system, and it just doesn't happen.*

This was confirmed by one of the counsellors: *But most of them come from situations where their day and night rhythms have been reversed and where they've been neglected and everything – so brushing their teeth isn't really in their system, so to speak.*

All three perspectives agreed that 'getting it into your system' was best done at a young age, when parents teach their children to brush twice a day. Counsellors and OHPs indicated that the adolescents' parents may also have a mild intellectual disability. They also suggested that toothbrushing should be included structurally in the adolescents' daily schedule at the care facility. Some of the adolescents saw a role for the counsellors to get or keep brushing 'into the system'. Others considered counsellors' involvement in brushing to be 'infantilizing'—in their view, the only way counsellors could get involved in their toothbrushing habits would be by giving reminders: A: *You arrange that yourself because you're responsible for your own teeth. The counselor, or carer, whatever you call it, can tell you to brush your teeth. But if you don't do it, they can't put the toothbrush into your mouth. So it's your own responsibility.*

In most cases the counsellors prompted the adolescents to brush by reminding them at fixed times. There were no systematic checks

on whether brushing actually took place, or how well. The reason counsellors gave was lack of time. However, the level of supervision also appeared to depend on the personal attitude of the counsellor: C: *Some colleagues are there when they brush their teeth. In my own case, I don't always think it's a priority.*

3.2.3 | Execution: A lack of structure. "They may want to brush, but ultimately don't do it"

When the quality of brushing was discussed, the counsellors indicated that there is a rush, and lack of focus when brushing, which meant that the adolescents may want to brush, but ultimately did not.

C: *Let me put it this way. If you leave it to the adolescents themselves, what you often see is that they intend to do it, but thanks to the usual rush and hurry, they end up not doing it.*

Brushing strategies: "What works for one, may not work for another"

When strategies to brush well were discussed with the adolescents, they agreed that what worked for one person may not work for another. An electric toothbrush that beeped after 2 min was mentioned as an aid to brushing long enough. But others considered electric toothbrushes to be 'for lazy people' or 'just not nice', or thought manual toothbrush were 'simply better'. While an app that reminded users to brush was considered 'very convenient' by some, others found it 'a hassle'. Other strategies that were mentioned included brushing in front of the mirror before putting on makeup, while watching TV, or when taking a shower.

OHPs considered a lack of structure to be the most important barrier to twice-daily toothbrushing. They considered this in very broad terms, which applied not only to the adolescents' unstructured methods of brushing and the counsellors' unstructured approach to supervising it, but also to the institution's policy on daily oral care. To improve the adolescents' compliance and skills, the OHPs therefore felt that the care facility should establish toothbrushing as a daily group activity.

3.3 | A maximum of seven food or drink intakes per day

3.3.1 | Attitude, planning and behaviour: A matter of structure, or of opportunities?

With regard to facilitating healthy eating and drinking, structure emerged as a major factor of influence. All three perspectives referred to its importance on three levels: the rules set by the care facility, the house rules of the individual group homes, and a structured daily schedule. However, such structures were provided mainly in the daytime and to those who went to school. While there was some monitoring of what the adolescents took to their rooms in the evening,

restrictions seemed to depend on the specific house rules within a group and on the individual counsellor. A: *In a closed department, there's a lot of supervision. But in an open group, it's very easy – bag of chips, food, energy drink.* According to the counsellors, the adolescents set no boundaries for themselves. C: *If we let go, they'd always be in the fridge.* Another counsellor added: *...or they would only eat chocolate.* Some counsellors reported that they checked everything that goes upstairs [to the adolescents' rooms] with them. Although others did not, they knew that the adolescents snacked in the evening and in their rooms at night. The adolescents and OHPs alike emphasised the importance of good examples set by the staff, which, they felt, were sometimes lacking. Regarding their own behaviour, some adolescents stated firmly that they mainly drank water and that they ate snacks only on weekends. For others, snacking was unstructured, taking place between meals during the day, but also in the evening, all weekend, and at night. A: *My little fridge is right next to my bed. All I need to do is lean out of bed a bit, and then I'm inside.*

3.4 | Scheduled visits to a dental practice

3.4.1 | Attitude: It is all about anxiety

Adolescents and staff alike named anxiety as the most significant factor determining the attitude towards dental visits, with an important role for negative experiences earlier in life, surfacing the importance of the abilities of OHPs. Fear was seen in a broad sense: fear of pain; fear resulting from earlier negative experiences; fear of the unknown (i.e., of what could happen); fear of breaking the normal daily routine, and fear of leaving the safe environment of the group. Staff also indicated that negative experiences were possibly related to a discrepancy between an adolescent's calendar age and their social-emotional development. C: *We overestimate these youngsters. If a child aged six goes to the dentist, you also hold his hand, don't you?* The OHPs suspected that, since these adolescents' disabilities may not have been recognised in general dental practices, their ability to cope in a dental setting may have been overestimated, resulting in negative experiences. To encourage the adolescents to visit a dental practice regularly, it would also be helpful to ensure they knew more about special care centres, and what these centres could provide that a general dental practice could not.

3.4.2 | Planning: Who is responsible?

Within the facility where the adolescents lived, there was a dental practice with OHPs trained in special dental care. To ensure compliance with appointments, the adolescents were not allowed to schedule their appointments themselves. Their visits to the dentist and the dental hygienist were always planned by the dental team, and the counsellors reminded them of their appointments both on the day before the visit and on the day itself. When discussing this approach

to planning, the adolescents had two different responses: some said they immediately entered the appointment in their phones so they would not forget, while others were annoyed at not having been involved in the planning, and therefore felt no responsibility about missing their appointments. A: *Yes, I should have gone, but I didn't know. So it really depends on the counsellors. They make the appointments, not me.* A: *Look, if I were allowed to make those appointments myself, it would be a lot easier.*

3.4.3 | Execution: Communication is key

All parties identified a trusted counsellor as an important factor in facilitating visits to the dental practice. Nonetheless, some adolescents still refused to go. A: *I'm afraid of the dentist. If I go, I'll go in the hospital [i.e., under general anaesthesia]. Otherwise I won't.* The adolescents attached importance not only to triggers such as “the needle” and the dentist's instruments, but also to the OHP's character. A: *I don't know who your dentist is, but mine is a witch!* Another adolescent, who claimed never to have been afraid, described his dentist as *chill*.

Counsellors identified three important means of reducing anxiety and encouraging visits to the dental practice: positive experiences, reassurance, and accompanying the adolescents to the OHP. In many cases, the adolescents themselves asked the counsellors to provide support by going with them. C: *Like, I don't have to go alone, do I?* However great the special-care knowledge and skills of the OHPs at the care facility, the counsellors saw an important role for themselves in communication between OHPs and adolescents. One counsellor put it like this: *Often you go along to translate as well. These adolescents have an information-translation disorder. So if the dentist says, ‘you have an inflammation in your root canals, and we need three separate visits to deal with it—this is the first phase of treatment, this is the second, and this is the third—, he'll come back to the group and say, ‘I have an infection somewhere. My tooth has to come out’.*

OHPs stressed the importance of building a bond of trust with the adolescents before restorative treatments take place. They sometimes felt they lacked the opportunity for this, especially if there were already several dental problems at the first visit. Although OHPs always used anxiety-reducing techniques, and always sought a positive approach, different adolescents had different experiences with their explanations of treatment. If the OHP explained a lot, some adolescents found it ‘annoying’ and ‘infantilizing’. A: *Then I'm like, just do it.* Another claimed indignantly that there had been too little explanation: *Some of them [i.e., the OHPs] don't even say what they're going to do!* Overall, while OHPs found it difficult to cope with adolescents who lacked a sense of responsibility about preventing oral-health problems, they were unanimous that the attitudes of adolescents with MBID towards the dental setting were influenced by earlier negative experiences of it. OHP: *These young people haven't yet experienced that we want to help them keep their teeth healthy and beautiful.*

3.5 | The major influencing factors: Structure, anxiety, support

3.5.1 | Structure and its relationship to MBID characteristics, childhood experiences, counsellor support and policies within the care facility

Structure or the lack of it emerged as an important influencing factor in the planning and execution of both toothbrushing and limiting the number of intakes per day. Structure was used in a broad sense. It involved the planning and focus of the adolescents themselves, but also the structure in their daily schedule supported by the counsellors, and the rules set by the care facility. Regarding toothbrushing, the adolescents clearly linked childhood experiences to structure by their quote: "it has to be in your system".

3.5.2 | Anxiety and its relationship to childhood experiences, characteristics of MBID and abilities of OHPs: The anxiety cycle

The self-perpetuating pattern of negative experiences, anticipation and worry, physical and emotional distress, avoidance behaviour, deteriorating oral health, conformation of fear and reinforcement of anxiety is known as the anxiety cycle. Dental anxiety was found to be a significant barrier to dental visits, in part due to negative childhood experiences in dental settings. In addition, there were indications that OHPs did not adequately recognise signs of MBID and overestimated adolescents' coping skills. The combination with the communication challenges brought about by all three perspectives demonstrated how the MBID of the adolescents may have aggravated their dental anxiety. Consequently, these circumstances require OHPs to be highly skilled in building trusting relationships and implementing effective anxiety management techniques.

3.5.3 | Counsellor support: Balancing support needs and burgeoning autonomy with competing priorities in the background

Support from counsellors emerged as a crucial factor in all areas of the adolescents' oral health behaviour. This support was needed in reducing the adolescents' anxiety in all phases of the dental visit: preparations for the appointment, during the appointment, and in processing afterwards. In addition, it was important for creating a structured environment in which limiting the number of intakes and effective toothbrushing all become habits. Moreover, counsellors saw a role for themselves in providing tailored education about oral health. The adolescents acknowledged the importance of support by the counsellors. However, they also clearly expressed a need for autonomy in the planning and execution of oral health behaviours, demonstrating the importance of balancing support and autonomy to each adolescent's individual needs and abilities. Counsellors nonetheless

reported that competing priorities were a barrier to the provision of such support. Like the OHPs they expressed the need for an effective oral health policy to be developed by the residential care facility that valued their role.

4 | DISCUSSION

To our knowledge, this is the first study intended to identify the factors influencing the oral health behaviours of adolescents with MBID living in residential care. It obtained data from focus-group discussions and from interviews, not only with 12 of these adolescents, but also with 9 counsellors and 6 OHPs. With a view towards the development of effective oral health interventions for this group, the topics discussed included the adolescents' knowledge, attitudes, and behaviour (in terms both of its planning and its execution) regarding three key oral health behaviours: (1) toothbrushing twice daily, (2) a maximum of seven food or drink intakes per day, and (3) scheduled visits to a dental practice. In the discussion we reflect on suggestions emerging from our research regarding toothbrushing as a group activity, the role of OHPs, education, and policies within care facilities, and we give suggestions for further research. We discuss the environmental influences on the oral health of adolescents with MBID, and reflect on the strengths and limitations of our study.

4.1 | Toothbrushing as a group activity

OHPs and counsellors suggested that toothbrushing should be included as a group activity in the residential group's daily schedule. Such an approach would be consistent with a report by the Netherlands Youth Institute (Zoon, 2012) indicating the importance for these adolescents of learning through concrete exercises. Other research found deficiencies in the manual dexterity of children with MBID (Vuijk et al., 2010). A daily supervised toothbrushing activity may improve both fine motor skill execution and the oral hygiene of the adolescents involved. However, the adolescents in our study proposed a more individualised approach, in which staff supervised those who were known to be bad brushers', but not those who did well. This suggests that such group activities may be accepted by adolescents only if they balance support and supervision with respect for the adolescents' autonomy.

4.2 | The role of oral healthcare professionals

Our research findings demonstrate that known characteristics of MBID such as limitations in executive functions (i.e., planning, focus, cause-effect thinking, impulse control, and cognition), a disharmonic developmental profile (De Beer, 2016), and limitations in health literacy influence the adolescents' oral health behaviours. Therefore, it is essential for OHPs to first and foremost recognise the signs MBID. However, the adolescents had a range of attitudes towards the three

behaviours we assessed. Aligning with the 'Guideline effective interventions for youngsters with MID' (de Wit et al., 2012), OHPs should therefore be aware that, to implement oral health interventions, including anxiety management, effectively in this group, it is vital to first assess each adolescent's individual strengths and needs. Such a need for individualised care was emphasised by the adolescent participants in our study, who indicated that 'what works for one doesn't work for all.' Effective communication skills on the part of OHPs are key to achieve this, as is the case with Motivational Interviewing (MI). This technique is often used in Dutch general dental practice to enhance patients' intrinsic motivation for adhering to oral-health-promoting behaviours (Gresnigt-Bekker, 2011). The OHPs in our study also indicated using this technique, although its effectiveness in oral healthcare has not yet been confirmed (Carra et al., 2020; Gao et al., 2014; Ulliana et al., 2021). In addition, it should be noted that there are various ways in which MI should be tailored to the special needs of those with MBID, such as adapting the language, summarising frequently, and using visual aids and role-play (Frielink & Embregts, 2013). For successful implementation of MI with adolescents with MBID, a collaboration between OHPs and psychologists may be necessary, as is already practiced in Dutch Centers for Special Dental Care. Moreover, OHPs should recognise the important role of counsellors, emerging from our research, as intermediaries between adolescents with MBID and OHPs. Nevertheless, based on the Consolidated Framework for Implementation Research (<https://cfirguide.org>) the effectiveness of MI in oral healthcare needs a robust evidence portfolio before its adjustment for MBID and implementation. A modern approach is the Implementation Research Logic Model (Smith et al., 2020) as that can also aid implementation researchers and implementation partners in the planning and execution of practice change initiatives.

4.3 | Education

Our results show that while adolescents with MBID do have a knowledge of certain oral health-related behaviours, this knowledge may not be based on understanding, and may easily be taken out of context. This implies that messages about preventive oral health may not reach adolescents with MBID very successfully. As school-based educators are trained to educate this specific target group, policymakers should be made aware of the suggestion emerging from current research that this message may be transmitted effectively by improved in-school education on oral-health-promoting behaviour. Next to the three oral health-related behaviours we discussed, also diet quality should be included in preventive oral health messages, as this is low in people with MBID (Gast et al., 2021). Moreover, OHPs have suggested that an educational leaflet on oral-health-related behaviours should be created for counsellors, who serve as information-transfer intermediaries between adolescents and OHPs, to help them educate the adolescents. This suggestion fits well with the counsellors' suggestion to provide oral health information during the weekly educational hour on personal care in the group home and deserves further investigation.

4.4 | Policies within the residential care facility

The counsellors—whose crucial role became very apparent during our study—reported that competing priorities were a barrier to facilitating effective oral health behaviour in adolescents. Like the OHPs, they believed that the residential care facility should develop a policy for promoting oral health effectively. Such a need is underscored by research evaluating the working ingredients of carer-led oral hygiene interventions for people with disabilities (Waldron et al., 2020), which reported an overwhelming consensus that, if an intervention is to work, a system-level approach is essential. The research in question also saw stakeholder involvement as an opportunity to identify the barriers to the implementation and sustainability of the oral health promoting policy within the care facility.

4.5 | Oral health, only a matter of behaviour?

Although our focus on the influence of personal behaviour on oral health may suggest that caries and periodontitis can be seen as behavioural diseases, we also found the influence of environmental factors such as childhood experiences and education. Robust systematic reviews support this finding with evidence that a higher risk of caries is associated with low socioeconomic position, with components including education, parental education, income, and social position (Schwendicke et al., 2015; WHO, 2022). This association is particularly strong in developed countries (Jepsen et al., 2017).

Although the experiences of parents were not captured in this study, the importance of parents' role in teaching children how to brush their teeth and in "getting twice-daily toothbrushing into the system" appeared several times in our results. Regarding parental support it should also be taken into account that parents of adolescents with MBID may also have an intellectual disability (De Beer, 2016), indicating an increased risk of limited social support, poverty and poor access to health services during the childhood of adolescents with MBID (Nouwens et al., 2017; Wieland & Zitman, 2016). This supports the finding of Duijster et al. (2014) that children in organised families have significantly fewer cavities than those in less well-functioning families, the frequency of toothbrushing being influenced particularly by family organisation, structure, and routine.

The strong influence of socioeconomic position and family organisation implies that preventive and restorative oral healthcare may not have reached adolescents with MBID very successfully during childhood and underscores the importance of developing effective oral health interventions for this vulnerable group.

4.6 | Strengths and limitations

A strength of this study is that it gives a voice to a vulnerable group of adolescents, i.e., those with MBID who do not live at home with their parents. As far as we are aware, it is the first to report the views of this group on the barriers to and facilitators of oral health behaviours.

These views were augmented by two other perspectives: those of counsellors working with these adolescents, and those of OHPs experienced in special dental care. In our judgement, this combination enabled us to identify a balanced range of influencing factors that will be relevant to all stakeholders involved in promoting oral health for adolescents with MBID.

A possible limitation of our study was our selection of participants. The adolescents and counsellors were recruited from group homes for adolescents with MBID within a single residential care facility for people with intellectual disabilities. Recruitment was organised by the manager of the facility according to the willingness and availability of eligible participants on the day planned for the interviews. Reasons for declining participation were not systematically recorded. We cannot rule out the possibility that the results were influenced by this selection method. As this raises the question of whether these results can be generalised, it represents a call for replication studies on a wider scale.

5 | CONCLUSION

Nine factors, related to four stakeholders, influence multiple aspects of the oral health behaviour of adolescents with MBID, showing the complexity of the oral care process. Three factors are pivotal: (1) Structure, or the lack thereof, is a major factor influencing twice-daily toothbrushing and the ability to limit the number of food and drink intakes to a maximum of seven per day. Structure has to be looked at in a broad sense, involving the planning and focus of the adolescents themselves, the structure in their daily schedule as facilitated by the counsellors, and the rules set by the care facility. (2) Anxiety is a major factor impeding dental visits. (3) Support by counsellors. Counsellors have a crucial role, not only in providing daily guidance of the adolescents' oral hygiene and diet, but also as intermediaries between adolescents and OHPs to reduce adolescents' dental anxiety. Counsellors need to balance support with the burgeoning autonomy of the adolescents, and require a clear oral health policy within the care facility to address competing priorities.

AUTHOR CONTRIBUTIONS

All authors gave final approval and agreed to be accountable for all aspects of work ensuring integrity and accuracy. SKS contributed to conception and design, analysis and interpretation, and drafted the manuscript. RvZ contributed to conception and design, data collection, analysis and interpretation, and critically revised the manuscript. DSA contributed to data collection, analysis and interpretation, and critically revised the manuscript. HA contributed to conception and design, data collection, analysis and interpretation, and critically revised the manuscript. CV contributed to analysis and interpretation, and critically revised the manuscript.

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CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflicts of interest.

DATA AVAILABILITY STATEMENT

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

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REFERENCES

- Carra, M. C., Detzen, L., Kitzmann, J., Woelber, J. P., Ramseier, C. A., & Bouchard, P. (2020). Promoting behavioural changes to improve oral hygiene in patients with periodontal diseases: A systematic review. *Journal of Clinical Periodontology*, 47(S22), 72–89. <https://doi.org/10.1111/jcpe.13234>
- Chapple, I. L., Bouchard, P., Cagetti, M. G., Campus, G., Carra, M. C., Cocco, F., Nibali, L., Hujoel, P., Laine, M. L., Lingström, P., Manton, D. J., Montero, E., Pitts, N., Rangé, H., Schlueter, N., Teughels, W., Twetman, S., van Loveren, C., van der Weijden, F., ... Schulte, A. G. (2017). Interaction of lifestyle, behaviour or systemic diseases with dental caries and periodontal diseases: Consensus report of group 2 of the joint EFP/ORCA workshop on the boundaries between caries and periodontal diseases. *Journal of Clinical Periodontology*, 44, S39–S51. <https://doi.org/10.1111/jcpe.12685>
- De Beer, Y. (2016). *Kompas Licht Verstandelijke Beperking, definitie, aspecten en ondersteuning*. Uitgeverij CP.
- de Wit, M., Moonen, X., & Douma, J. (2012). *Guideline effective interventions for youngsters with MID: Recommendations for the development and adaptation of behavioural change interventions for youngsters with mild intellectual disabilities*. Dutch Knowledge Centre on MID [Google Scholar].
- Doyle, J. (2009). Using focus groups as a research method in intellectual disability research: a practical guide. The national federation of voluntary bodies providing services to people with intellectual disabilities.
- Duijster, D., Verrips, G. H. W., & van Loveren, C. (2014). The role of family functioning in childhood dental caries. *Community Dentistry and Oral Epidemiology*, 42(3), 193–205. <https://doi.org/10.1111/cdoe.12079>
- Frielink, N., & Embregts, P. J. C. M. (2013). Modification of motivational interviewing for use with people with mild intellectual disability and

- challenging behaviour. *Journal of Intellectual & Developmental Disability*, 38(4), 279–291. <https://doi.org/10.3109/13668250.2013.809707>
- Gan, C., Campbell, K. A., Snider, A., Cohen, S., & Hubbard, J. (2008). Giving youth a voice (GYV): A measure of youths' perceptions of the client-centredness of rehabilitation services. *Canadian Journal of Occupational Therapy*, 75(2), 96–104. <https://doi.org/10.1177/000841740807500205>
- Gao, X., Chu, C. H., Kot, S. C. C., & Chan, K. S. (2014). Motivational interviewing in improving Oral health: A systematic review of randomized controlled trials. *Journal of Periodontology*, 85(3), 426–437. <https://doi.org/10.1902/jop.2013.130205>
- Gast, D. L., De Wit, G. L. C., Van Hoof, A., De Vries, J. H., Van Hemert, A. M., Didden, R., & Giltay, E. J. (2021). Diet quality among people with intellectual disabilities and borderline intellectual functioning. *Mental Handicap Research*, 35(2), 488–494. <https://doi.org/10.1111/jar.12958>
- Geukes, C., Bröder, J., & Latteck, Ä. D. (2019). Health literacy and people with intellectual disabilities: What we know, what we do not know, and what we need: A theoretical discourse. *International Journal of Environmental Research and Public Health*, 16(3), 463.
- Ghafari, M., Bahadivand-Chegini, S., Nadi, T., & Doosti-Irani, A. (2019). The global prevalence of dental healthcare needs and unmet dental needs among adolescents: A systematic review and meta-analysis. *Epidemiology and Health*, 41, e2019046. <https://doi.org/10.4178/epih.e2019046>
- Green, J., & Thorogood, N. (2018). *Qualitative methods for Health Research*. SAGE Publications Limited.
- Gresnigt-Bekker, C. O. V. M. (2011). Motivational interviewing in de tandheelkundige praktijk. *Het Tandheelkundig Jaar*, 2011, 136–150.
- Jepsen, S., Blanco, J., Buchalla, W., Carvalho, J. C., Dietrich, T., Dörfer, C., Eaton, K. A., Figuero, E., Frencken, J. E., Graziani, F., Higham, S. M., Kocher, T., Maltz, M., Ortiz-Vigón, A., Schmoekel, J., Sculean, A., Tenuta, L. M. A., van der Veen, M. H., & Machiulskiene, V. (2017). Prevention and control of dental caries and periodontal diseases at individual and population level: Consensus report of group 3 of joint EFP/ORCA workshop on the boundaries between caries and periodontal diseases. *Journal of Clinical Periodontology*, 44, S85–S93. <https://doi.org/10.1111/jcpe.12687>
- Kim, J. K., Baker, L. A., Davarian, S., & Crimmins, E. (2013). Oral health problems and mortality. *Journal of Dental Sciences*, 8(2), 115–120. <https://doi.org/10.1016/j.jds.2012.12.011>
- Nouwens, P. J. G. G., Lucas, R., Embregts, P. J. C. M. C. M., & van Nieuwenhuizen, C. (2017). In plain sight but still invisible: A structured case analysis of people with mild intellectual disability or borderline intellectual functioning. *Journal of Intellectual and Developmental Disability*, 42(1), 36–44. <https://doi.org/10.3109/13668250.2016.1178220>
- Parker, A., & Titter, J. (2006). Focus group method and methodology: Current practice and recent debate. *International Journal of Research and Method in Education*, 29(1), 23–37. <https://doi.org/10.1080/01406720500537304>
- Peres, M. A., Macpherson, L. M., Weyant, R. J., Daly, B., Venturelli, R., Mathur, M. R., Listl, S., Celeste, R. K., Guarnizo-Herreño, C. C., Kearns, C., Benzan, H., Allison, P., & Watt, R. G. (2019). Oral diseases: A global public health challenge. *The Lancet*, 394(10194), 249–260. [https://doi.org/10.1016/S0140-6736\(19\)31146-8](https://doi.org/10.1016/S0140-6736(19)31146-8)
- Schallock, R. L., Borthwick-Duffy, S. A., Bradley, V. J., Buntinx, W. H. E., Coulter, D. L., Graig, E. M., Gomez, S. C., Lachapelle, Y., Luckasson, R., Reeve, A., Shogren, K. A., Snell, M. E., Spreat, S., Tasse, M. J., Thompson, J. R., Verdugo-Alonso, M. A., Wehmeyer, M. L., & Yeager, M. H. (2010). *Intellectual disability: Definition, classification, and systems of supports* (11th ed.). American Association on Intellectual and Developmental Disabilities.
- Schuller, A. A., Vermaire, J. H., van Kempen, C. P. F., van Dommelen, P., & Verrips, G. H. W. (2018). *A survey on oral health and preventive behaviour of children and young adults in The Netherlands – Main study Report* R10317 (Vol. 2018). TNO. <https://www.tno.nl/nl/aandachtsgebieden/gezond-leven/roadmaps/youth/kies-voor-tanden/>
- Schwendicke, F., Dörfer, C. E., Schlattmann, P., Page, L. F., Thomson, W. M., & Paris, S. (2015). Socioeconomic inequality and caries: A systematic review and meta-analysis. *Journal of Dental Research*, 94(1), 10–18. <https://doi.org/10.1177/0022034514557546>
- Smith, J. D., Li, D. H., & Rafferty, M. R. (2020). The implementation research logic model: A method for planning, executing, reporting, and synthesizing implementation projects. *Implementation Science*, 15, 84. <https://doi.org/10.1186/s13012-020-01041-8>
- Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*, 19(6), 349–357. <https://doi.org/10.1093/intqhc/mzm042>
- Ulliana, S. B., Utami, U., Nurwanti, W., & Nurrochman, A. (2021). Brief motivational interviewing counseling to improve Oral hygiene behaviour among adolescent. *Pakistan Journal of Medical and Health Sciences*, 15(10), 3103–3108. <https://doi.org/10.53350/pjmhs2115103103>
- Valm, A. M. (2019). The structure of dental plaque microbial communities in the transition from health to dental caries and periodontal disease. *Journal of Molecular Biology*, 431(16), 2957–2969. <https://doi.org/10.1016/j.jmb.2019.05.016>
- van der Molen, M. J., Van Luit, J. E. H., Jongmans, M. J., & Van der Molen, M. W. (2007). Verbal working memory in children with mild intellectual disabilities. *Journal of Intellectual Disability Research*, 51, 162–169. <https://doi.org/10.1111/j.1365-2788.2006.00863.x>
- Vermaire, J. H., Kalf, S. M., & Schuller, A. A. (2020). Oral health and oral health behaviour of adolescents with mild or borderline intellectual disabilities compared with a national representative sample of 17-year-olds in The Netherlands. *Journal of Applied Research in Intellectual Disabilities*, 34(June), 1–9. <https://doi.org/10.1111/jar.12829>
- Vuijk, P. J., Hartman, E., Scherder, E., & Visscher, C. (2010). Motor execution of children with mild intellectual disability and borderline intellectual functioning. *Journal of Intellectual Disability Research*, 54(11), 955–965. <https://doi.org/10.1111/j.1365-2788.2010.01318.x>
- Waldron, C., MacGiolla Phadraig, C., & Nunn, J. (2020). What is it about carer-led oral hygiene interventions for people with intellectual disabilities that work and why? A realist review. *Community Dentistry and Oral Epidemiology*, 48(6), 522–532. <https://doi.org/10.1111/cdoe.12564>
- Wieland, J., & Zitman, F. G. (2016). It is time to bring borderline intellectual functioning back into the main fold of classification systems. *BJPsych Bulletin*, 40(4), 204–206. <https://doi.org/10.1192/pb.bp.115.051490>
- World Health Organization. (2022). *Global oral health status report: Towards universal health coverage for oral health by 2030*. World Health Organization.
- Zoon, M. (2012). *Wat werkt bij jeugdigen met een licht verstandelijke beperking?* Nederlands Jeugd Instituut. www.nji.nl

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