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Shaiyini and Gijssel, Esther Bakker-van (2025) Implementation of
Annual Health Assessments for Adults With Intellectual Disabilities:
An Integrative Review. Journal of Policy and Practice in Intellectual
Disabilities, 22 (2).

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ORIGINAL ARTICLE **OPEN ACCESS**

Implementation of Annual Health Assessments for Adults With Intellectual Disabilities: An Integrative Review

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ABSTRACT

People with intellectual disabilities (ID) face health inequalities, often arising from undiagnosed health conditions. An annual health assessment (or health check) administered by a primary care provider can be a systematic method of identifying these health conditions and initiating treatment and management, leading to better health outcomes. While these health checks are recommended in many countries, including the United Kingdom (UK), they have not been administered to all adults with ID. In light of this, the barriers and facilitators to systematic implementation have not been systematically studied. The aim of this Integrative review was to identify the barriers and facilitators to the systematic implementation of health checks, using the Consolidated Framework for Implementation Research (CFIR). This model has been used in implementation research and is useful in determining the levels of healthcare interaction that are involved in the delivery of this intervention. We identified 35 peer-reviewed primary research articles that met inclusion criteria. The barriers and facilitators to health check implementation were extracted and coded according to the individual involved, whether it was a barrier or facilitator, and the domains and constructs of the CFIR model. We concluded that most factors related to the physician's role, as well as many factors related to the intervention itself. Some of these facilitators included the perceived efficacy of the health check intervention and the belief that it provides more comprehensive care. Some of the barriers include additional time that is necessary to implement the intervention and a lack of resources. Future interventions could train physicians and target some structural health system barriers to implementing health checks, and further research with physicians, patients, and carers is needed. This research may confirm the barriers and facilitators to health check implementation and explore methods to promote health checks.

1 | Introduction

In several countries, annual health assessments (commonly called health checks) are recommended by health organizations. Health check instruments for people with ID often consist of three elements: new disease detection, age- and gender-specific preventive screening, and health promotion (Bakker-van Gijssel et al. 2017). Health checks may include screening for certain cancers, cardiovascular disease, and hypertension, eye and ear problems, and counselling around lifestyle such as diet

and exercise. Some commonly used health checks include the Comprehensive Health Assessment Program (CHAP, Lennox et al. 2013) and the Cardiff Health Check (Martin et al. 1997a).

In England in 2017–2018, 147181 checks were given to people registered with their GP as having an ID; 52% of all adults for whom their GP knew they had an ID had a health check, 90% of all GP practices performed a health check on at least one adult with an ID, and 95% of adults who were known to their GP as having ID were at a practice that was giving health checks

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that year (Public Health England 2020). By 2020–2021, 75.2% of adults with IDD had received an annual health check (NHS Digital 2021).

There is growing evidence of the benefits of health checks, including better health outcomes. A systematic review and meta-analysis found that health checks can increase preventive and primary care, especially vision tests, blood pressure checks, and hepatitis B vaccination (Byrne et al. 2016). Additionally, health checks can detect previously undiagnosed needs, can lead to increased screening and health promotion activities, and are acceptable to people with IDD and their carers. They can increase awareness about health needs in this population among health professionals conducting the health check (Robertson et al. 2014). However, in spite of the benefits of health checks, there are many difficulties in implementing health checks, including: the time to administer health checks (Macdonald et al. 2018), primary care providers being reluctant to screen because they lack the information about what services are available for newly identified problems (Martin et al. 1997b), and in some jurisdictions, lack of funding to healthcare providers to complete the health check (Shooshtari et al. 2017).

For the current review, we followed an integrative review process, as described by Broome (1993). This methodology builds on a scoping review to go beyond merely describing the findings from different primary research articles and maps the key categories onto an existing theory. In this review, we used the Consolidated Framework for Implementation Research (CFIR) by Damschroder et al. (2009) to categorize the barriers and facilitators to implementing annual health checks onto the constructs that these authors posit are responsible for whether a new clinical intervention is implemented routinely.

2 | Methods

2.1 | Theoretical Framework

The CFIR model (Damschroder et al. 2009) is useful to assist researchers and clinicians in identifying the barriers and facilitators to implementing an evidence-based practice because it identifies multiple levels at which barriers and facilitators may have an effect on implementation. These levels include the individual clinician's attributes, the inner setting of the organization, the outer setting of the organization, the intervention itself, and the process by which the intervention is implemented. The aim of this integrative review is to identify the barriers and facilitators to implementing annual health checks for adults with ID by mapping these factors onto the CFIR model. With regard to clinical practices such as health checks, there are multiple levels of interaction: the individual patient and clinician, the environment of both the health centre and the environment of the larger health organization. The characteristics of the intervention itself and the steps taken to implement a specific intervention can also impact whether a routine practice such as a health check is routinely implemented. By examining the different levels that may affect whether health checks are implemented by a given organization, we hope to identify any barriers to systematic implementation that may be addressed through training or policy and

the facilitators to implementing this intervention to increase its uptake in parallel settings. A summary of the CFIR model is given in Table 1.

2.2 | Eligibility Criteria

For the review, the following inclusion criteria were used to determine if a research article was included in the data extraction and analysis: (1) patients 18 years and older included (although patients aged 14–18 years may be included in some countries, studies that exclusively looked at those under the age of 18 were excluded); (2) articles written in English; (3) article included primary research results (quantitative, qualitative, or mixed methods); (4) included patients with intellectual disabilities; (5) health checks conducted as part of primary care visits; and (6) article was peer reviewed. Accordingly, the exclusion criteria was: (1) participants were patients under 18 years; (2) commentary, expert opinion, practice guidelines, systematic or narrative review articles; (3) screening was for a specific condition (e.g., hearing, vision, cancer, oral); (4) the article was not specific to health checks; (5) article did not include factors related to implementing health checks; and (6) the article was not specific to patients with intellectual disabilities.

The protocol for this integrative review was registered on the Open Science Framework in May 2023 (Open Science Framework 2024) and made public.

2.3 | Literature Search

A systematic search of three international research databases, PubMed, PsycINFO, and CINAHL, was conducted in August–September 2020, using the search strategies given in Table 2. This search was repeated using the same search terms in all databases in August 2022, but no additional studies meeting inclusion criteria were identified at this time.

TABLE 1 | CFIR constructs (adapted from Damschroder et al. 2009).

Construct	Short description
Intervention	Relates to characteristics of the intervention itself.
Outer setting	Relates to the wider environment the implementation occurs within
Inner setting	Relates to the institution and cultural aspects that the implementation occurs within
Characteristics of Individuals	Relates to aspects of the individuals and how they interact to implement the intervention
Process	Relates to the steps taken to implement the intervention.

TABLE 2 | Search strategy.

Database	Block 1	Block 2
PubMed	(“Intellectual Disability”[Mesh:noexp] OR “Mentally Disabled Persons”[Mesh] OR “Developmental Disabilities”[Mesh] OR intellectual disab*[tiab] OR intellectually disab*[tiab] OR learning disab*[tiab] OR developmental disab*[tiab] OR developmentally disab*[tiab] OR mental disab*[tiab] OR mentally disab*[tiab] OR mental retard*[tiab] OR mentally retard*[tiab] OR mental handicap*[tiab] OR mentally handicap*[tiab] OR mental deficient*[tiab] OR mentally deficient*[tiab])	((“Mass Screening”[Mesh:noexp] OR “Outcome Assessment (Health Care)”[Mesh:noexp] OR “Preventive Health Services”[Mesh:noexp]) OR health screening[tiab] OR health protocol*[tiab] OR health guideline*[tiab] OR health assessment[tiab] OR health check*[tiab] OR health maintenance[tiab] OR preventive health research[tiab] OR preventive health service*[tiab] OR proactive healthcare[tiab] OR pro-active healthcare[tiab] OR pro-active health care[tiab] OR proactive health care[tiab] OR preventive care[tiab] OR preventive health care[tiab] OR preventive healthcare[tiab] OR proactive disease prevention[tiab] OR pro-active disease prevention[tiab])
CINAHL	(MH “Mentally Disabled Persons”) OR (MH “Developmental Disabilities”) OR TI (intellectual disab* OR intellectually disab* OR learning disab* OR developmental disab* OR developmentally disab* OR mental disab* OR mentally disab* OR mental retard* OR mentally retard* OR mental handicap* OR mentally handicap* OR mental deficient* OR mentally deficient*) OR AB (intellectual disab* OR intellectually disab* OR learning disab* OR developmental disab* OR developmentally disab* OR mental disab* OR mentally disab* OR mental retard* OR mentally retard* OR mental handicap* OR mentally handicap* OR mental deficient* OR mentally deficient*) OR (MH “Mental Retardation”)	(MH “Health Screening”) OR (MH “Health Status Indicators”) OR (MH “Hearing Screening”) OR (MH “Vision Screening”) OR (MH “Outcome Assessment”) OR TI (outcome assessment OR health screening OR health protocol* OR health guideline* OR health assessment OR health check* OR health maintenance OR preventive health research OR preventive health service* OR proactive healthcare OR pro-active healthcare OR pro-active health care OR proactive health care OR preventive care OR preventive health care OR preventive healthcare OR proactive disease prevention OR pro-active disease prevention) OR AB (outcome assessment OR health screening OR health protocol* OR health guideline* OR health assessment OR health check* OR health maintenance OR preventive health research OR preventive health service* OR proactive healthcare OR pro-active healthcare OR pro-active health care OR proactive health care OR preventive care OR preventive health care OR preventive healthcare OR proactive disease prevention OR pro-active disease prevention)
PsycINFO	Exp intellectual development disorder/or delayed development/or developmental disabilities/ or learning disabilities/or (intellectual disab* or intellectually disab* or learning disab* or developmental disab* or developmentally disab* or mental disab* or mentally disab* or mental retard* or mentally retard* or mental handicap* or mentally handicap* or mental deficient* or mentally deficient*).ti,ab	Screening/or health screening/or physical examination/ or (outcome assessment or health screening or health protocol* or health guideline* or health assessment or health check* or health maintenance or preventive health research or preventive health service* or proactive healthcare or pro-active healthcare or pro-active health care or proactive health care or preventive care or preventive health care or preventive healthcare or proactive disease prevention or pro-active disease prevention).ti,ab

The initial search resulted in 6189 articles across the three databases. Once the articles were assessed for eligibility for full-text review and duplicates were removed, a total of 87 articles were assessed for full-text review. After full-text review, 32 studies met inclusion criteria and thus were included in the data extraction and coding process. The reasons for studies not meeting inclusion criteria are given in Figure 1. We subsequently reran the searches on CINAHL, PsycINFO (on EBSCO databases) and PubMed using the same terms in May 2024, and found an additional three journal articles that met inclusion criteria, for a total of 35 articles being included in the review. The full-text screening was conducted by two of the authors, and the two authors had 100% agreement with which articles were to be included.

2.4 | Data Extraction and Analysis

All of the articles that met inclusion criteria underwent data extraction by two authors (GB and RT). The results section of each article was read, and any barriers and facilitators to implementing health checks were entered into a spreadsheet and coded by the individual involved in the factor (patient, physician, carer, or other) and whether it was a barrier or facilitator. Each factor was then coded according to the CFIR model (i.e., individual clinician's attributes, the inner setting of the organization, the outer setting of the organization, the intervention itself, and the process by which the intervention is implemented). Each of the included articles was evaluated for its quality using either Critical Appraisal Skills Programme

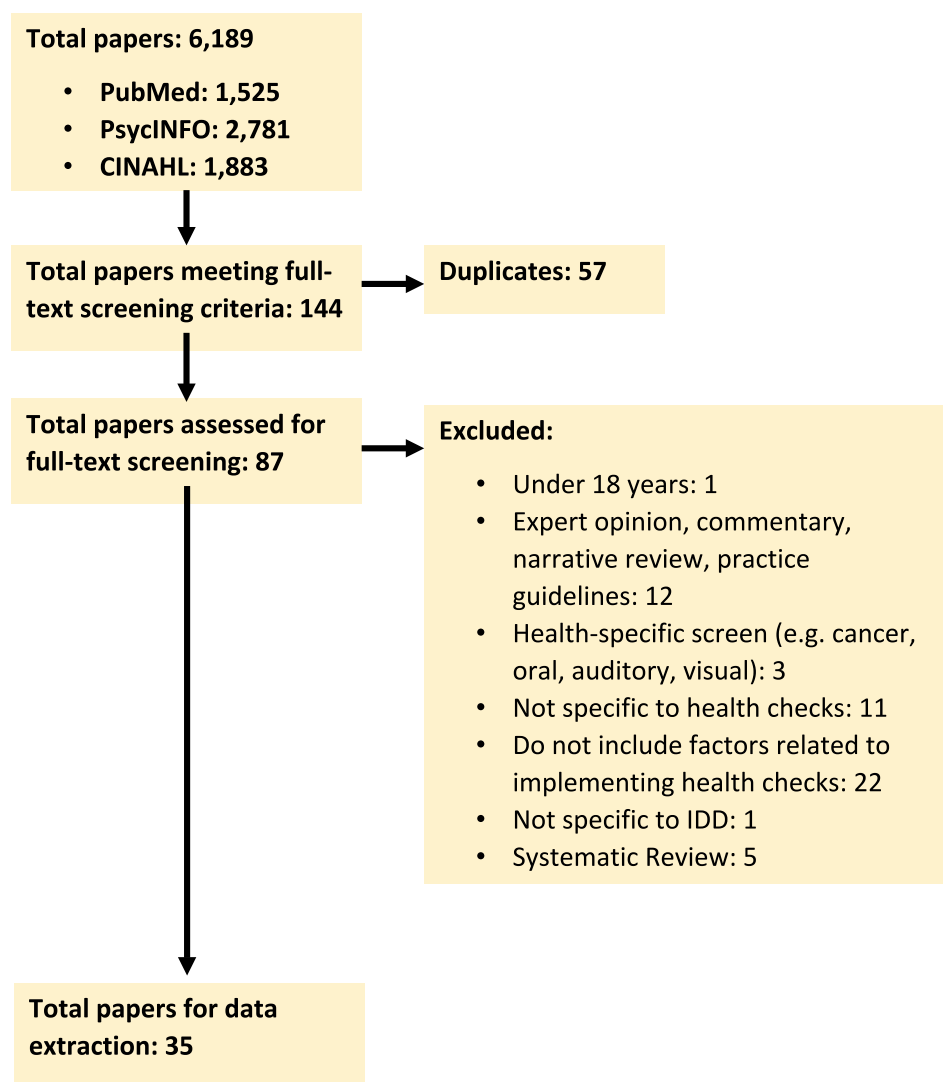


FIGURE 1 | Study flow.

(Critical Appraisal Skills Programme 2024), Joanna Briggs Institute (Joanna Briggs Institute n.d.), or the Mixed Methods Appraisal Tool (MMAT, Hong et al. 2018) criteria by one of two authors (GB and SR), and calibration was reached between the two authors. Generally, the CASP criteria were used, but JBI or MMAT would be used if CASP did not have a checklist for that specific methodology in the study. For both the data extraction, data coding, and quality assessment, a subset of articles was scored by both scorers, and calibration of at least 80% was reached before the remaining studies were scored separately.

3 | Results

Of the 35 articles included in the data extraction and analysis, all were published between 1996 and 2023. Thirteen articles used qualitative methods (e.g., interviews, focus groups), 18 articles used quantitative methods (e.g., surveys, audits of available data, randomized controlled trials) and four studies used mixed methods. In total, 21 studies took place in the UK, two in the Netherlands, six in Australia, five in Canada, and one in New Zealand. More information about each study is in Table 3.

Out of the 35 articles, 218 factors were extracted. When considering which construct of the CFIR model the factors were related to, 116 factors were related to the physician or health professional in the interaction, 49 related to the patient, 11 were related to the carer, and 42 factors were not specifically related to an individual in the interaction. This data is shown in Table 4.

In total, 80 factors were barriers, and 138 factors were facilitators. An example of a barrier is that a GP feels they do not have sufficient time to complete a health check, or that it is difficult to determine the eligible patients. Examples of facilitators include having easy-read information about the health check or having additional clinical support to assist with the health checks.

In terms of the CFIR Domains, 107 factors related to the Intervention Domain, 23 related to the Outer Setting, 19 related to the Inner Setting, 45 related to the Individual, and 24 related to the implementation Process. Within each Domain, Relative Advantage was the most common construct relating to the Intervention ($n = 39$). This is a belief that the benefits of conducting an annual health assessment outweigh the resources

TABLE 3 | Characteristics of included studies.

Author	Year	Study aim(s)	Methods	Country	Participants
Antaki and Chinn	2019	How companions manage their claim to know information over which the patient has prior rights of entitlement	Qualitative (conversation analysis)	England (UK)	Consultation between GPs and patients and their companions
Bakker-van Gijssel et al.	2017	To explore GP's considerations about applying a health assessment for people with ID	Qualitative	Netherlands	General Practitioners
Bakker-van Gijssel et al.	2020	To further develop the health assessment questionnaire with respect to comprehensibility and clarity for the target population	Qualitative (Cognitive interviewing technique)	Netherlands	People with IDD
Barr et al.	1999	To study how community IDD nurses could assist people with IDD in being healthier by conducting health checks	Quantitative	Northern Ireland (UK)	People with IDD
Bond et al.	1997	The aim of this study was to compare the attitudes of GPs in Gwent to those of GPs in west Gloucestershire, using the intellectual disability attitude questionnaire, and also to explore the factors underlying these attitudes for all GPs who responded	Quantitative	England (UK)	General Practitioners
Burton and Walters	2013	The aim of this research was to gain a better understanding of whether and how people with ID access annual comprehensive health assessments (ACHAs)	Semi-structured interviews were conducted with people with ID and their carers	Australia	People with IDD and their carers
Carey et al.	2017	To evaluate whether or not annual health checks for adults with ID have reduced emergency hospitalization, and to describe health, health care and mortality for adults with ID	A retrospective matched cohort study using primary care data linked to national hospital admissions and mortality data sets	England (UK)	People with IDD
Cassidy et al.	2002	The aim was to provide systematic health checks to detect, quantify and treat physical and mental health conditions in a population with IDD	Quantitative	England (UK)	People with IDD
Cavanagh et al.	2024	To identify health issues during annual health checks	Qualitative	Wales (UK)	People with IDD
Chauhan et al.	2010	To explore the additional value of a health check for people with ID compared with standard care provided through the current QOF structure	Quantitative	England (UK)	People with IDD
Durbin et al.	2016	Study aims are to describe the practice changes made to implement the health check, and to evaluate how the practice context affected the implementation decisions	Qualitative	Ontario (Canada)	People with IDD

(Continues)

TABLE 3 | (Continued)

Author	Year	Study aim(s)	Methods	Country	Participants
Durbin et al.	2019	To implement a Health Check protocol for patients with intellectual and developmental disabilities (IDD) and assess outcomes	Quantitative (survey)	Ontario (Canada)	People with IDD and providers
Giles et al.	2020	This study explored service users' and health professionals' perspectives and experiences of adopting minimally invasive diagnostic and screening devices, known as point-of-care testing (POCT) as a means of improving access and engagement	Focus groups and semi-structured interviews	England (UK)	People with IDD and providers
Hunt et al.	2001	The rationale was that people with learning disabilities were already used to this particular environment, and to seeing community nurses there	Quantitative	England (UK)	People with IDD
Iacono et al.	2006	The study aims were to: (1) identify and describe the extent of health screening service utilization among adults with DD; and (2) explore potential factors that may influence the use of health screenings for people with DD, in particular, living arrangement, severity and type of DD, and age	Quantitative (survey)	Australia	People with IDD
Jones and Kerr	1997	An intervention which helps GPs to target opportunistically those areas of health most often deficient in people with learning disability would appear to be of considerable benefit. The study was designed to evaluate the health care impact of the prompt	Quantitative	Wales (UK)	Patients with IDD
Jones et al.	2010	Despite this complex picture of health needs, health screening for individuals with Down syndrome is not reported in the literature, and does not appear to be routinely carried out. In Fife, a multi-disciplinary health screening clinic for people with Down syndrome has been carried out over the past 2 years, with the aim of detecting any changes in health across a broad spectrum of issues. This paper describes the clinic and its process, with findings after 18 months	Quantitative	Wales (UK)	People with IDD
Kerr, Dunstan, and Thapar	1996	Assess GP's views of routine care, health promotion and annual health checks for people with IDD and the role of specialists	Postal survey to measure attitudes towards people with IDD	Wales (UK)	GPs in Gwent, South Wales

(Continues)

TABLE 3 | (Continued)

Author	Year	Study aim(s)	Methods	Country	Participants
Koritsas, Iacono, and Davis	2012	Evaluate uptake of IDD health assessment items	Using Australian Medicare Benefits Schedule statistics to evaluate uptake of health assessments	Australia	Australian GPs
Lennox, Green, Diggins, and Ugoni	2001	Determine the effect of variance interventions on health maintenance activities and to assess their acceptability to GPs (evaluate use of CHAP)	Questionnaire-based postal survey	Australia	GP-patient dyads
Lennox et al.	2013	To describe GP perceptions of using the CHAP for the first time	Qualitative study: interviews with GPs	Australia	GPs
Macdonald, Morrison, Melville, Baltzer, MacArthur, and Cooper	2018	Explore practice nurse perceptions and experience of delivering an anticipatory health check for people with IDD	RCT of practice nurse led health check with embedded qualitative study	Scotland (UK)	Practice nurses
Martin et al.	1997a	Identify the experiences, expectations and opinions of people with intellectual disability and their carers of primary care services	Mixed methods: forum of carers, service, users, and service providers, focus groups of service users and survey of unpaid carers	England (UK)	Patients, carers, and GPs
Martin, Roy, Wells, Lewis	1997b	Evaluate experiences of primary health care with people with intellectual disability and their carers	Questionnaires, focus groups	UK	People with IDD, carers
McConkey, Moore, and Marshall	2002	Examine how the attitudes of GPs towards health screening for people with IDD is affected by specialty health screening service provided by two nurses	Postal survey (pre/post)	Northern Ireland (UK)	GPs involved in health screening service
McConkey, Taggart, and Kane	2015	To review the possible factors affecting the provision of health checks and contribution of team of staff known as health facilitators	Audit of anonymized data	Northern Ireland (UK)	Patients receiving health checks
McNeil et al.	2024	To co-design and conduct implementation strategies with stakeholders to increase the uptake of periodic health checks	Qualitative methods	Canada	Primary care providers
Perry, Felce, Ken, Bartley, Tomlinson, Felce	2014	Gather patients' experiences with health checks as part of Disability Rights Commission inquiry and evaluate annual checks initiative in Wales	Qualitative (focus groups)	Wales (UK)	People with IDD
Potvin, Fulford Ouellette-Kuntz, Cobigo	2019	To understand the support needs of people with IDD in scheduling, travelling to, and attending health checks	Qualitative	Canada	People with IDD

(Continues)

TABLE 3 | (Continued)

Author	Year	Study aim(s)	Methods	Country	Participants
Shooshtari et al.	2017	Determine the feasibility of implementing the CHAP in Manitoba, Canada	Qualitative study using a purposive sample of physicians, nurse practitioners, support workers, families; semi structured interviews and focus groups	Canada	Physicians, nurse practitioners, support workers and families
Walker, Beck, Eccles, Weston	2016	Recommendation to implement annual health check to identify gaps in current service provision and make recommendations to address unmet health needs and reduce health inequalities	Data audit of clinical from GP practices	UK	People with IDD
Walmsley	2011	To describe an investigation of the implementation of Annual Health Checks in an English county, Oxfordshire	Mixed Methods	UK	GPs and practice nurses/practice managers, self-advocates
Ware and Lennox	2016	To assess the characteristics of people who when offered a health check with their GP at no cost completed the health check	Pooled data from three randomized controlled trials	Australia	People with IDD
Webb and Rogers	1999	Persuade health system to implement health checks, train staff to use health checks and for GPs to introduce health checks, decide how to fund health checks, develop resources for health checks, monitor health checks and see whether goals met	Audit of clinical data	New Zealand	People with IDD
Wigham et al.	2022	To improve GP primary care access for people with IDD and co-produce recommendations	Qualitative	UK	People with IDD

required to routinely implement annual health checks. External Policy and Incentives was the most common construct related to the Outer Setting ($n = 16$). This construct refers to when there may be a financial incentive to clinicians who conduct the health check, or the time available for each primary care appointment enables the health professional to utilize additional time to engage with the annual health check routinely with patients. Structural Characteristics was the most common construct related to the Inner Setting ($n = 12$), for instance, if an academic health centre associated with the primary care facility promotes the routine implementation of annual health checks. Reflect and Evaluate was the most common construct for Process ($n = 10$), for example, health professionals believing that the majority of patients with intellectual disabilities received better care in settings in which the annual health check is routinely implemented. Knowledge and Beliefs about the Intervention was the most common construct for the Individual Domain ($n = 30$). An example of this construct is if an individual clinician believes that the benefits of implementing an annual health check (for instance detecting unmet health needs) outweigh the inconveniences of implementing an annual health check (for instance the additional time and resources required to implement a health check routinely). Please see Table 4 for more information about the number of factors related to each construct.

Examples of factors related to the Intervention domain include having a standardized form with questions so that health checks are implemented more uniformly (Barr et al. 1999) and the belief by physicians that implementing health checks can aid in detecting unmet health needs (Cassidy et al. 2002). The structure of specialist learning disability nursing teams in some countries that cater to the needs of this population, including annual health checks, is an example of a facilitator related to the implementation of annual health checks (Bond et al. 1997). A facilitator that is internal to the inner setting of implementing an annual health check is when in some countries health professionals may access a register or list of individuals at that clinic who are recognized to have intellectual disabilities and thus are eligible for a health check (Durbin et al. 2016). A barrier that may occur that is specific to an individual health professional would be if they feel they lack sufficient training (either pre-registration or continuing professional training) to successfully and efficiently implement annual health checks for patients with intellectual disabilities in their care (Macdonald et al. 2018). An example of a facilitator related to the process of implementation is if, by conducting the annual health check, the physician reaches out to people with intellectual disabilities who are not currently seen by the primary care team (Bakker-van Gijssel et al. 2017).

A quality assessment of each of the 35 included articles was conducted by two of the authors, using one of the three quality appraisal criteria (CASP, JBI, or MMAT) appropriate to the study methods. All articles were appraised to be of sufficient quality to be included in the review, with all articles scoring the maximum or near maximum score on quality.

4 | Discussion

We found that many factors related to the individual, specifically the physician, in their ability to promote health checks. It

TABLE 4 | Summary of analysis of studies.

Variable	Level	Factor	Count
Participant involved	Physician or health professional		116
		Patient	49
		Carer	11
		Other	42
Type of factor	Barrier		80
		Facilitator	138
CFIR domain	Intervention		107
		Relative Advantage	39
		Adaptability	14
		Evidence strength and quality	5
		Design and packaging	12
		Cost	8
		Trialability	1
		Complexity	28
		Outer	23
		Patient needs and resources	14
		External Policy and Incentives	8
		Peer pressure	1
		Inner	19
		Structural characteristics	12
		Readiness for Implementation	3
		Networks and Communication	2
		Implementation climate	2
		Individuals	44
		Knowledge and beliefs about the intervention	30
		Self-efficacy	10
		Other attributes	5

(Continues)

TABLE 4 | (Continued)

Variable	Level	Factor	Count
	Process		25
		Reflect and Evaluate	10
		Executing	9
		Engaging	3
		Planning	2
Total factors			186

is possible that developing interventions aimed at physicians, for example continuing medical education, may increase the uptake of health checks. Previous research has shown that younger physicians generally have more positive attitudes towards the community inclusion of individuals with ID (Breau et al. 2021). Developing interventions to modify physicians' attitudes towards community inclusion, and to provide training on how to effectively deliver health checks, may be beneficial.

It is important that more of the factors identified in the data analysis were facilitators to promote the implementation of health checks, rather than barriers that would inhibit annual health check implementation. Some key facilitators in this analysis included physicians having the belief that the health check identifies unmet needs (e.g., Cassidy et al. 2002), or would promote more comprehensive care for adults with ID (e.g., Carey et al. 2017). The perceived quality of the health check intervention was also seen as a benefit (e.g., Lennox et al. 2001). Alternatively, lack of time to complete the health check (e.g., Macdonald et al. 2018; McConkey et al. 2002) and lack of training for completing the health check (e.g., Macdonald et al. 2018) were seen as barriers that perhaps a future intervention to promote the health check as a standard of care would be helpful.

In terms of the CFIR constructs, most factors were related to the intervention itself, such as belief in the efficacy of the health check intervention (e.g., Lennox et al. 2001) and the belief that it leads to more comprehensive care (e.g., McConkey et al. 2002) are perceived benefits of the intervention itself that future training for physicians could emphasize. Other barriers, such as lack of time or resources to conduct the screening (e.g., McConkey et al. 2015) point to structural characteristics that are barriers to implementation and indicate the need for structural and policy changes to facilitate screening. Thus, likely a two-pronged approach: providing more training for healthcare providers responsible for administering the health check intervention and advocating for policy changes to facilitate screening are likely needed to more systematically implement health checks in multiple countries. An added difficulty is that training alone may not lead to changes in practice; thus, adaptations at the institutional level (inner setting as per the CFIR model) may be needed to create changes to routine practice, for example changing how appointment time is accounted for in the clinic setting so that there is a greater incentive to account for the time to implement the annual health check routinely.

There were some limitations to the current study. For example, the studies were limited to English-language articles, and thus

certain countries were overrepresented. This is a limitation of the current review because many non-English speaking countries routinely conduct annual health checks. Also, no studies from low- and middle-income countries were identified, limiting the transferability of findings to non-high-income countries. Also, the systematic search was limited to peer-reviewed manuscripts: it is possible that had grey literature been included, these manuscripts could have provided useful data, although it was felt to maintain the rigor of the review, the search would be limited to peer-reviewed journal articles. This is the first article where we use a model (CFIR) to examine the factors that play a role in performing a health check. While the CFIR model was chosen as most relevant to the review aims, it is possible that other theoretical models, such as the Theoretical Domains Framework (Cane et al. 2012) would also have been useful. Normalization Process Theory (Murray et al. 2010) may also be useful in understanding how health checks can be implemented routinely, especially in this theory the process for deciding whether there is sufficient evidence that the new intervention is clinically feasible. Additionally, the included studies focused on the role of clinicians (such as general practitioners and learning disability nurses) in implementing health checks. The perspectives of policy makers, who also have an influential role in the structural framework for implementing health checks systematically, have not been reviewed extensively to date. Finally, it is possible that there may be learnings from implementing annual health checks in other populations, such as those with cardiovascular disease or certain mental illnesses.

In conclusion, while health checks have been proven to have many benefits (Robertson et al. 2014), they are not universally implemented, even in countries that recommend annual health checks. Future interventions could focus on factors at both the individual and system level. For instance, providing additional training to health professionals responsible for administering routine primary care, including health checks, could ease the implementation process and increase rates of administering health checks. Making changes in some countries to allow primary care providers more time within an appointment to conduct an annual health check, and having monetary incentives to health professionals who perform health checks, could also increase health check rates. Further, qualitative studies with healthcare providers administering the health checks, and patients and carers involved in the health checks, are needed to confirm which barriers could be overcome through interventions, and how facilitators could be more widely adopted.

Acknowledgments

The development work from this project was originally developed by EB and Heidi Diepstra, PhD (Surrey Place, Toronto, Ontario, Canada). Conceptualization of this project also took place as part of a Task and Finish Group at the International Association for the Scientific Study of Intellectual and Developmental Disabilities Health Issues Special Interest Research Group conference in June 2017 in Belfast, Northern Ireland.

Ethics Statement

Because this is a systematic review manuscript, no institutional ethical approval was required or sought. All primary research included in the review was peer reviewed and thus followed ethical principles.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The authors have nothing to report.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.