Université de Montréal

L'évaluation cognitive d'individus atteints de déficience(s) sensorielle(s).

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Résumé

Les déficiences visuelles et auditives sont toutes deux liées au déclin cognitif, qui se traduit par des résultats plus faibles aux tests cognitifs. Cependant, la plupart des outils cognitifs comprennent des tâches audio-visuelles et nécessitent une audition et une vision fonctionnelles. Par conséquent, l'administration de tests cognitifs à des personnes atteintes de déficience sensorielle est difficile et peut induire en erreur l'interprétation clinique.

Les études présentées dans ce mémoire avaient pour objectif d'explorer la manière dont les chercheurs et les cliniciens adaptent leurs procédures de tests cognitifs tout en considérant les déficiences sensorielles. Pour atteindre cet objectif, une revue de la portée a exploré les adaptations rapportées aux procédures de tests cognitifs que les chercheurs ont employées lors de l'évaluation de personnes âgées ayant une double déficience sensorielle. Ensuite, une enquête clinique a examiné comment les ergothérapeutes adaptent leurs procédures de dépistage cognitif pour accommoder les personnes ayant une déficience sensorielle.

Les résultats de ce mémoire indiquent un écart entre la recherche et la pratique concernant les stratégies issues de données empiriques et les stratégies utilisées en clinique afin d'accommoder les déficiences sensorielles pendant l'administration de tests cognitifs. Alors que les chercheurs disposent de ressources supplémentaires adéquates dans des domaines spécialisés des soins de santé, les ergothérapeutes se sentent moins compétents avec leurs clients atteints de déficience sensorielle. Cette divergence entre les stratégies empiriques et pratiques soulève la nécessité de diffuser aux cliniciens des stratégies alternatives standardisées et fondées sur des données probantes par le biais d'activités d'application des connaissances.

Mots-clés : aveugle, basse vision, déficience auditive, déficience visuelle, dépistage cognitif, double déficience sensorielle, évaluation cognitive, ergothérapie, personnes âgées, surdité

Abstract

Visual and hearing impairments have both been linked to cognitive decline as expressed by lower scores on cognitive tests. However, most cognitive tools include audio-visual tasks and require functional hearing and vision for their completion. Therefore, administering cognitive tests to individuals with sensory impairments is challenging and may mislead clinical interpretation.

The studies presented in this *mémoire* had the objective to explore how researchers and clinicians adapt their cognitive testing procedures while considering sensory impairments. To achieve this goal, a scoping review explored the existing adaptations to cognitive tests procedures that researchers employed during the testing of older adults with dual sensory impairment. Subsequently, a clinical survey investigated how occupational therapists adapt their cognitive screening procedures to accommodate individuals with sensory impairment.

The evidence from this *mémoire* indicates a knowledge-to-practice gap between evidence-based and practical strategies to accommodate sensory impairment during cognitive test administration. While researchers are adequately supplied with additional resources in specialized health care fields, occupational therapists experience less self-perceive competency with their clients with sensory impairment. This discrepancy between empirical and practical strategies raises a need for standardized and evidence-based alternative strategies to be disseminated to clinicians through knowledge translation activities.

Keywords: cognitive evaluation, deaf, blind, dual sensory impairment, hard-of-hearing, hearing impairment, low vision, occupational therapy, older adults, visual impairment

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Acronyms and abbreviations

Acronym/Abbreviation	Description
AMD	Age-related macular degeneration
CCNA	Canadian Consortium on Neurodegeneration in Aging
CPS	Cognitive Performance Scale
DSI	Dual sensory impairment
HI	Hearing impairment
ON	Ontario
MMSE	Mini-Mental State Examination
MoCA	Montreal Cognitive Assessment
OT/OTs	Occupational therapy/Occupational therapists
PRISMA	Preferred reporting items for systematic review and meta-analysis protocols
QC	Quebec
TICS	Telephone Interview for Cognitive Status
VI	Visual impairment
WHO	World Health Organization

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"We think of our eyes as video cameras and our brains as blank tapes to be filled with sensory inputs."

—Michael Brant Shermer, American science writer

General introduction

As of 2021, the World Health Organization (WHO) reported 2.2 billion people worldwide living with a near or distant vision impairment and 430 million people with significant hearing loss (1,2). These sensory impairments are risk factors for the development of cognitive decline (3–5). They likely have a bi-directional relationship whereby the presence of one impairment increases the prevalence of the other (6). Additionally, sensory and cognitive functions both tend to decline with age (7). Age-related macular degeneration (AMD), glaucoma, and cataracts are some of the most common causes of visual impairment, especially in older adults (8). Presbycusis, or age-related hearing loss, is also prevalent in older adults (9). The scientific literature is abundant with theoretical models of the underlying mechanisms of this sensory-cognitive association.

The sensory deprivation hypothesis claims that sustained perceptual deficiencies may engender cognitive decline over time (10). Similar to the sensory deprivation hypothesis, the information degradation hypothesis suggests that an extra demand on cognitive resources to enhance sensory perception, caused by impoverished perceptual input, negatively affects performance during cognitive tasks (11). In contrast, a higher cognitive load, maybe caused by a cognitive dysfunction, may also negatively affect perceptual processes; the cognitive load hypothesis (12). The cascade hypothesis claims that poor perception as a result of pathology in the sensory modalities can affect physiological brain structures and reflect cognitive dysfunction. For instance, hearing loss has been linked to decreased brain volume in relevant brain structures as has also been evidenced in visual deficits (13–15). The aforementioned hypotheses reveal the importance of healthy sensory input in maintaining cognitive function. The sensory-mediated or the social-stimulation hypothesis proposes that a shortage of sensory input, due to a lack of social activities, has also been linked to decreased cognitive health, even when sensory function is controlled for (16,17). Another proposed theoretical model is the common cause hypothesis

speculating that a third general factor, such as the natural aging process, is the underlying cause of concurrent decline in both perception and cognition (18). While a certain level of sensory and cognitive decline is a normal aspect of aging, severe degradation may lead to decreased health and quality of life (19).

Sensory perception is a cognitively effortful task as we need to comprehend, remember, and respond to objects and events that we perceive (20). This process is also influenced by many personal factors such as target goals, intrinsic reward systems and motivation (20). Such factors, among others, are conveyed during the performance of cognitive screening tests such as in the *Montreal Cognitive Assessment (MoCA)* (21). Cognitive screening tests are often perceptually rich tasks. Instructions are generally presented orally, participants carry out some tasks by hand, on printed paper all while several cognitive functions are recruited for performance. Therefore, when sensory function degrades, this poses an inevitable challenge for cognitive test performance.

One shortcoming of commonly used screening tests is that their validation studies often did not include clinical sub-groups of participants such as individuals with sensory loss. Furthermore, as they are standardized and validated tests, test administrators cannot deviate from administration guidelines because such deviations may compromise the integrity of the test (22). Yet, to this day, these tools are administered to these clinical groups without rigorous parameters. Whichever mechanisms characterizes the sensory-cognitive link, a question arises: How can we sensibly and confidently administer cognitive tests to individuals living with sensory impairment? The studies presented in this *memoire* are aimed at answering this issue, offering insights from the perspectives of the research and clinical worlds.

Chapter 1 - *Adaptations During the Cognitive Evaluation of Older Adults with Dual Sensory Impairment: A Scoping Review*

Introduction

During the natural developmental process that is aging, sensory and cognitive functional decline can be observed. Hearing impairment (HI) and vision impairment (VI) in mid-life have been shown to be potentially modifiable risk factors for dementia in late life as they are associated with greater rates of cognitive dysfunction in older adults (3,4,23–25). Baltes and Lindenberger estimated that vision and hearing function account for around 93% of the age-related variability of an individuals' cognitive ability (26). However, the strength of this relationship may in part be influenced by a methodological limitation, as the traditional assessment of cognition heavily relies on functional vision and hearing at the time of administration. Impaired sensory function could therefore likely lead to the overdiagnosis of cognitive impairment, referred to as the harbinger hypothesis by Uchida et al. (23). These authors suggested that it is the degraded sensory modality, rather than cognitive function, that negatively impacts performance on neuropsychological tests (23). Empirical data support this theory because when hearing loss is simulated in cognitively healthy adults, test scores on auditory-based cognitive tests significantly decrease when compared to adults without hearing loss (24). Performance on cognitive assessments was also significantly impaired in older individuals with simulated visual disorder such as cataracts (27). Therefore, there is the possibility that cognitive deficits are simply being over-diagnosed in individuals with sensory impairment due to their disadvantage of decreased audibility and visibility during audio-visual tasks.

Overdiagnosis is critical to consider because of the lack of appropriate cognitive tests or tasks for individuals with sensory impairment. VI and HI have each been associated with poorer outcomes on cognitive assessments as illustrated by poor scores on cognitive screening tests, such

as the *Mini-Mental State Examination (MMSE)* (28) and the *MoCA* (21,29–31). This could be because individuals living with sensory impairment must exert additional effort when performing cognitive tasks. As a result of their deteriorating sensory function, this extra effort may lead to decreased performance motivation, negatively affecting their scores (20). This experience also pertains to combined VI and HI (dual sensory impairment/ DSI), where one sense cannot compensate for the other due to both being significantly impaired (32). This condition is complex and diverse in nature and intensifies the effect of sensory-cognitive aging. The majority of people living with DSI are over the age of 60 years (1,2). Age-related causes of sensory loss such as AMD and presbycusis are the principal causes of DSI (33). As a result, older adults represent a highly vulnerable population, both at risk of sensory and cognitive decline. The presence of these two impairments multiplies the effect on the affected person, impeding their quality of life (34). Therefore, the load of cognitive and sensory effort exerted during cognitive tasks requiring both vision and hearing function is also likely multiplied, increasingly affecting cognitive test performance.

There are currently no evidence-based clinical guidelines to optimize the administration of existing cognitive tests to older adults with both VI and HI. Further, there are no standardized and validated cognitive tools to administer to these older individuals. To our knowledge, the literature reports few cognitive tools designed for individuals with DSI that rely on the tactile modality (35–37). However, they have not been integrated into clinical practice and have not been validated. Therefore, the purpose of this scoping review was to explore accommodations for sensory impairment used in research during the cognitive evaluation of older adults with DSI.

Methods

A scoping review was the preferred methodological approach, given the exploratory nature of this study. We adhered to the *Joanna Briggs Institute* (JBI) methodology for scoping reviews

(38). The protocol was developed using the *Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P)* statement and reporting of this review was done with the use of the *PRISMA Extension for Scoping Reviews (PRISMA-ScR)* (39,40).

Eligibility criteria

Studies focusing on older adults with DSI (65 years +) were eligible for inclusion, given that this population is at greater risk of developing cognitive decline over time (5). For inclusion, participants in the eligible studies had to have reported both HI and VI as identified through behavioural tests or subjective reports, regardless of their nature and etiology. Study participants were not required to be diagnosed with or have suspected cognitive decline as this review addressed measures used to evaluate specific cognitive domains as well as overall cognition. Studies that did not focus on cognitive screening measures and related adaptations were excluded.

Although this scoping review focused on older adults with DSI, the initial screening of titles and abstracts was more inclusive. We did not expect a large number of studies to explicitly include participants with DSI; therefore, any study considering adaptations of cognitive measures for individuals with visual and/or hearing impairment was included at this stage of the scoping review. This procedure ensured that all potentially relevant articles made it through to the full-text screening. At the stage of full-text review, the inclusion criteria were more rigorous, only including studies comprising older participants with DSI. The final study eligibility criteria are outlined in Table 1.

Information sources

Six databases (*MEDLINE, Embase, Web of Science, CINAHL, PsycINFO, and Global Health*) were searched for articles in accordance with *PRISMA* (40). Furthermore, all eight databases from the *Evidence-based Medicine* (EBM) reviews database were searched.

Search

The concepts and database search strategies were developed with the collaboration and expertise of an experienced librarian for the *Université de Montréal*'s School of Optometry.

Search terms and keywords were explored through initial searches in the PubMed database. Relevant keywords were searched for synonyms, broader terms, narrower terms as well as alternate spellings, and were adapted for searches in the different selected databases.

The three main concepts that were explored are (A) cognitive evaluation, (B) DSI and (C) aging. Cognitive evaluation refers to any measure or tool evaluating various cognitive functions such as memory, language, abstraction, executive function and attention, either for the purpose of screening or as a neuropsychological assessment tool. Following the *Nordic Definition of Deafblindness* (32), DSI was defined as a condition that combines both hearing and vision loss to varying degrees. Impairments could be defined either based on self-report or questionnaires, or behavioral measures such as, visual acuity, contrast sensitivity or pure-tone audiograms and measures of speech perception in noise. Finally, older adults were defined as individuals aged 65 years or older.

Selection of sources of evidence

This review explored studies that adapted cognitive tools, their administration, or their scoring in order to accommodate task comprehension and performance for older individuals with DSI. Selected studies included any research design providing empirical data. Searches were not limited in publication time or location but were limited to the French, English, Portuguese and German languages. Editorials, commentaries, conference publications, academic theses and dissertations, books or letters were not included. Searches were performed in May 2021. An example of a search strategy performed in the MEDLINE database is available in Table 2.

The articles resulting from database searches were exported to the EndNote X9 software (Clarivate Analytics, PA, USA) and subsequently to the Covidence software (Veritas Health Innovation, Melbourne, Australia) where article duplicates were removed (41,42). Within Covidence, two independent reviewers screened articles' titles, abstracts, as well as full texts for

inclusion in the scoping review using the criteria presented in Table 1. Any conflict in decision making was reviewed and resolved by a senior reviewer (WW).

Data charting and synthesis of results

Articles that met the inclusion criteria had their data extracted into a *Microsoft Excel* pre-designed extraction spreadsheet. Data was synthesized in a table and included qualitative and quantitative information such as study aim, design and setting, sample characteristics, type of vision and hearing assessments, reported cognitive tests used by researchers/professionals, administration adaptations, reliability and validity data as well as study results and main points. Additionally, a frequency table was compiled to reveal tendencies and most reported data of relevance across studies.

Results

Selection of evidence sources

The database searches yielded 1013 publications that were imported into Covidence. After 338 duplicates were removed, the titles and abstracts of 675 articles were screened and a total of 238 studies were deemed eligible to be comprehensively reviewed. At the stage of full-text review, 183 studies were excluded for reasons such as the absence of cognitive evaluation, or sample population characteristics (i.e., sample did not include older adults or individuals with DSI, or only considered HI and VI separately). A final total of 55 papers dating between 1998 and 2021 exploring the cognitive evaluation of older adults with DSI were included (see *PRISMA* flow chart in Figure 1).

Characteristics of evidence sources

Study Information: Twenty-nine articles did not specify their study setting. Of the studies that did report this information, the most reported setting was long-term care homes (n = 11). Nine studies were conducted in clinics or hospitals and one in a research laboratory. Studies that did not

report their setting tended to employ a retrospective study design, for example by using population-based surveys (*n* = 14). However, the most common study designs across the scoping review were cohort studies and cross-sectional studies (*n* = 15, respectively).

Sensory impairment diagnosis: All but two included publications assessed vision and hearing function as part of their research protocols to classify participants with sensory loss. Twenty-eight studies employed behavioural measures such as the Early *Treatment Diabetic Retinopathy Study (ETDRS*; *n* = 7) chart or the *Snellen* chart (*n* = 4*)*, while 19 studies opted for subjective reports as screening tools of visual function. Six studies included both subjective and behavioural visual measures. As for measures of hearing function, 25 studies opted for behavioral measures and 23 opted for subjective assessments. Behavioural measures include pure-tone audiometry, air-conduction threshold or otoscopies. Both subjective and behavioural assessments for hearing function were used in five studies. A list of all sensory measures is available in Table 3.

Cognitive measures: A total of 21 different cognitive tools were reported in this scoping review. The cognitive tool that was the most reportedly used was the *MMSE* (31) cited by 22 studies. Ten studies evaluated distinct cognitive domains instead of global cognition with the use of cognitive subtests such as the *Digit Span Backwards subtest of the German version of the revised Wechsler Adult Intelligence Scale (WAIS–R)* to measure working-memory performance and animal naming to evaluate verbal fluency (43). The *Cognitive Performance Scale (CPS)* (44) was used in ten studies. The *MoCA* (21), the *Telephone Interview for Cognitive Status (TICS)* (45) and the *Clinical Dementia Rating* (46) were respectively cited by three studies. Other reported measures included neuropsychological test batteries to establish the presence or absence of dementia (*n* = 2), self-reported diagnosis information (*n* = 2) and self-reported perception of cognitive function (*n* = 2).

Only one of the studies used a measure that accommodated for DSI. This cognitive tool consisted of a tactile test battery that did not require the participants to have functional hearing and vision as the tasks were performed with touch (35). In this study, task instructions were provided by trained deafblind consultants in tactile sign language, spoken language, by use of written texts or other communicative means adapted to the participants' sensory function (35). Seven studies used tests that inherently accommodate for visual impairment. These included cognitive evaluations conducted over the phone, without the presentation of visual items, or tests where the visually presented items were not completed by participants and the scoring was modified accordingly (35,45,47). However, none of the studies used a test that inherently accommodated for hearing impairment.

Adaptation of evaluation administration: All identified cognitive evaluation tools and the adaptations to cognitive test administration are provided in Table 3. Of the 55 included articles, only 22 studies (40%), made use of adaptations and accommodations during the administration of their cognitive evaluation. Five categories of adaptations were identified. The most frequently reported adaptation category was the implementation of a team of experts from related fields throughout the research studies (n = 13) (35,48–59). These experts included trained research assistants, nurses and/or social workers who were trained in administering the different tests and adapt their communication to the clinical participants. Deafblind/DSI specialists administered the various tests to individuals with DSI and also served as consultants during the sessions. Clinical psychologists, geriatricians, or geriatric psychiatrists validated the cognitive status of study participants. Another reported strategy was the modification of established standardized tests' scoring procedures. For instance, the *MoCA* (21) and the *MMSE* (31) in their blind versions (29,47,60–63) were respectively administered in two studies. In these studies, the total scoring of these tests was modified by the removal of the points awarded by the visually presented items.

Communication strategies were also employed to accommodate individuals with DSI in four studies (35,57,64,65). These strategies included the use of assistive devices, adapted speech and calling for feedback during the conversation. Four studies did not require to modify the scoring of their cognitive tool as they employed cognitive tests that, by design, did not include visual items, such as the *Telephone Interview for Cognitive Status (TICS),* and/or auditory items such as tactile tests (35,45,65–67). Two studies opted for post-hoc adaptations by performing data control through statistical analyses. They controlled the effects of sensory impairment on cognition by repeating analyses with the exclusion of participants with severe cognitive dysfunction or by statistically creating models separating cognitive function to avoid mediating effects with DSI (59,68). Two studies ensured a quiet environment to conduct the examination to maximize speech perception (57,65). Nineteen studies only implemented one test administration adaptation as part of their protocol. One study combined two adaptive strategies, namely statistical adaptations as well as professional training, and two studies integrated three strategies to ensure appropriate test performance and interpretation in older individuals with DSI.

Psychometric properties: None of the 22 studies that accommodated their cognitive test administration for older adults with DSI conducted validity analyses to ensure that their modifications did not alter the way in which the cognitive tools measure cognitive function. One article established the consistency of the cognitive measure they used across test administrators by reporting an inter-rater reliability of 90% which demonstrates very good agreement between test administrators (56).

Discussion

The present study aimed to identify adaptations that have been reported in empirical research studies during the cognitive evaluation of older adults with DSI. Surprisingly, however, we discovered a glaring lack of such accommodations, suggesting considerable disregard of the

sensory profile of participants. This discovery hints at how sensory impairment likely influences test performance and consequent interpretation in undetected ways. This neglect is highly problematic because it likely results in the overdiagnosis of cognitive difficulties, given the potentially deleterious effects of sensory loss on test accessibility (23). It is imperative to ensure that older individuals with DSI perform assessments to the best of their cognitive abilities, independently of their sensory limitations.

The adaptations noted in the included studies demonstrate a shortfall of solutions across the five identified categories. The majority of studies that adapted their protocol were conducted in long-term care homes, an environment with a greater prevalence of older adults with combined sensory and cognitive impairment (50). The researchers opted for the inclusion of trained experts to conduct or assist during cognitive evaluation in older adults with DSI (50). Including these experts may increase the rigour of research protocols because their expertise will substantiate the interpretation of tests results. However, depending on the test setting, it is unclear how available such resources may be when they are needed in practice. This conundrum of resource availability hints at the significance of individual clinicians using alternative strategies (or clinical intuition), that will not imply additional costly and time-consuming resources. Furthermore, this extension of clinical responsibility may indicate that individual clinicians do not feel competent enough in their own ability to deliver services to their clients with DSI, potentially affecting their clinical decision-making. Therefore, the focus of adaptation could be shifted to test administration procedures as well as clinician-centered strategies that will improve clinician competency. Client-centered strategies such as the provision of visual and/or hearing aids as well as other assistive technologies and strategies should also be explored.

Very few articles included in this review made use of alternative communication or environmental strategies. Only four studies used standardized cognitive tests where the visually

presented items were removed, and the scoring was adjusted accordingly. The *MoCA-Blind* has been validated against its full version, including the visually presented items (47). Wittich et al. have established that withdrawing the visual items from the tests and the score adjustment generated excellent test specificity (98%) and adequate sensitivity (63% in individuals with mild cognitive impairment) (47). Therefore, this modified version is reliable and valid for individuals with visual impairment. The blind version of the *MMSE,* the *MMSE-Blind,* that uses age-dependent cut-off values, has also been validated and reports excellent sensitivity (91-100%) and specificity (80-100%) (60). These assessments do not require clients to visually perceive test items and can also be administered over the phone. The obstacle with these measures is that they still do not accommodate for hearing impairment, which is problematic when such measures are administered remotely. Participants still need to hear and understand instructions in order to perform the tasks. The tactile test battery proposed by Bruhn and Dammeyer is an innovative step towards the validation of a measure for that population (35). However, for such a measure to be implemented for clinical and/or research purposes, the psychometric properties of cognitive measures must be revisited for administration in this clinical population. Unfortunately, such rigor was not observed in this scoping review as only one article reported reliability data, and none provided validity data. These characteristics must be substantiated by experts in neuropsychology, vision and hearing rehabilitation, speech communication, geriatrics as well as in nursing and occupational therapy. However, there is a potential risk that these adapted tools will be considered more cumbersome as they may require additional testing material, training, and time for practitioners.

Limitations

This scoping review is limited in that it focused on DSI in older adults. This condition only recently started receiving increased scientific attention given the increase in prevalence (22). As a result, implementing novel strategies that require rigorous standardization and validation is a lengthy process that is not yet reflected in clinical practice. By focusing our review on DSI, it is

possible that existing adaptive strategies specific to the administration of cognitive tests to individuals with only VI or HI have been missed. This prevents cross-comparisons in those strategies that may be suitable with clients with DSI. Furthermore, it would be relevant to explore accommodations used for individuals with sensory impairment of all ages and compare them across age groups.

Conclusion

Failure to ensure optimal cognitive testing for individuals with sensory impairment can lead to significant consequences, such as the misinterpretation of results due to a lack of consideration of the sensory abilities of clients (22,69). In addition, there is a risk of reduced test integrity by modifying scoring techniques, individual test items or the method of administration (22,70). Clinicians and researchers must consider many factors when planning the administration of cognitive evaluations to individuals with DSI and the interpretation of the subsequent results. It is crucial to have the proper knowledge and resources necessary when faced with this vulnerable population by appropriately preventing, detecting, diagnosing, or treating potential cognitive decline. In research settings, such misjudgment may lead to erroneous inferences about the cognitive abilities of participants. In clinical practice, the misinterpretation of cognitive tests may lead the provision of unnecessary services or inadequate treatment or referral and decreased clinicians' confidence in their practice. For that reason, exploring guidelines and adaptations to cognitive test administration to individuals living with sensory impairment is essential.

Transition

The scoping review highlighted the current practice in research with regard to the cognitive evaluation of individuals with decreased sensory function. Although the review focused on a specific population (older adults) with a distinct, complex condition (DSI), the results revealed administration strategies that are used in complex cases of sensory impairment, compared to single impairments. The main issue observed in the literature was a bias toward the recruitment of external resources in the adaptations and accommodations for DSI during cognitive evaluation. This may suggest that researchers feel that it is optimal to address the cognitive function of individuals with DSI by enriching their research team with experts. However, it is important to note that in research protocols, researchers aim to control as many variables as possible when investigating a hypothesis. Empirical research settings are arranged, controlled environments where a maximum of resources are recruited to attain scientific quality and rigour. Additionally, certain populations are targeted in those studies, with specific inclusion and exclusion criteria of participation eligibility, reducing the variability of individual characteristics in participants.

It is debatable whether similar practices are implemented in real time in current practice. In fact, clinical settings are variable environments with a constant flux of clients with unpredictable and various conditions. Therefore, we must inquire if what has been reported as strategies during cognitive test administration is reflected in current clinical practice. The study in the following chapter drew on the evidence from the scoping review and aimed to identify a potential knowledge-to-practice gap between the reported accommodations for sensory impairment in the research literature and in clinical practice in Canada. This investigation will contribute to the identification and recognition of clinical needs for optimal cognitive evaluation of individuals with sensory impairment.

Chapter 2 - *Canadian Occupational Therapists' Practice and Self-Competency in Screening Cognitive Function of Persons Living with Sensory Impairment*

Introduction

Cognitive impairment is a debilitating condition that can negatively affect several aspects of an individual's life including relational and psychological health as well as his or her occupational performance and functional independence (19). Preventing or minimizing the effect of cognitive impairment on quality of life is imperative. The early detection and management of signs of cognitive decline have demonstrated to improve treatment course of action and disease prognosis (71). Although primary care health providers (e.g., family physicians or nurses) recognize the importance of routine cognitive screening tests, they acknowledge that they face difficulties in the detection (screening), evaluation (assessment), treatment and management of sensory as well as cognitive impairment compared to other geriatric conditions (72). Consequently, the majority do not consistently perform cognitive screening tests in their practice with their elderly clients (73). They also describe principally administering cognitive assessments only when their clients indicate a subjective cognitive concern or report a biological risk factor for cognitive decline, such as family history (73,74). To fill the gap of missing information, the responsibility of cognitive screening often then lies with secondary care providers, such as occupational therapists.

Occupational therapists (OTs) are essential healthcare workers generally operating at the rehabilitation stage, with the professional goal of improving the occupational performance of their clients, while considering their disabilities (75). By its very nature, occupational therapy is part of secondary care, as it is a referred specialty from primary care, after a diagnosis or intervention is appointed during the first point of contact in healthcare provision. It has even been suggested that occupational therapy could be added to the primary care model of health services (76). In their practice, OTs are likely to encounter a wide range of clinical populations and provide

individualized interventions, rendering them expanded knowledge and expertise (76,77). They also perform tasks that are assumed to be of primary care delivery such as health prevention and the management of chronic diseases (77). Integrating occupational therapy in primary care could positively contribute to the prevention, management, and rehabilitation of disabilities such as cognitive dysfunction (77).

Since cognitive function is generally linked to functional ability (78), it is advised that OTs conduct cognitive screening before undertaking an intervention to conscientiously understand their clients and their needs. OTs can perform cognitive screening through different means such as the observation of their clients' functional ability while performing various tasks of daily living, the use of standardized cognitive tests, self-reported cognitive complaints, or the retrospective examination of clinical history (79–81). Nonetheless, cognitive screening using standardized cognitive tests is usually the favored approach in clinical practice because they are quick and efficient (82). Cognitive screening tests usually undergo an extensive, empirical validation process before implementation in practice. They mostly serve the purpose of patient observation, the recognition of dysfunction and the identification of potential risk, but are not intended or designed to make a formal diagnosis of dementia (82).

Although standardized cognitive screening tests are great tools in measuring changes in cognitive function over time, they are not perfect. Various client characteristics can interact and reduce their validity and subsequent interpretation such as age, fatigue, and intrinsic motivation (20,83). Sensory impairment is a variable that may negatively affect cognitive test performance due to the audio-visual nature of traditional cognitive tests. As a result, the presence of sensory impairment can negatively influence the clinical judgment of cognitive abilities and may lead to misdiagnosis, especially the overdiagnosis of cognitive decline, misattributed to cognitive function instead of impaired sensory modalities (23).

Even though validated, some standardized cognitive tools lack evidence of how they can best be used with client groups affected by different impairments in clinical practice (82). One of the reasons why these tests are not being used in primary care is because they are considered inadequate for some client groups, such as individuals presenting neuropsychiatric symptoms or individuals with sensory impairment (82,84). This is potentially also the case when it comes to clients living with sensory deficit(s) because variables such as population heterogeneity, the disease etiology and the individuals' needs make the administration and interpretation of test results more complex (83). The scoping review of the literature presented in the previous chapter has revealed various accommodations that have been applied during the administration of cognitive tests to minimize their inefficiency in this clinical population. In empirical settings, researchers and clinicians mostly accommodate their clients with DSI by consulting with experts of different disciplines (32,35,53). Other reported adaptations included the modification of standardized tests' scoring and the use of cognitive tools without visually presented items (29,61). Clinical settings, however, are rarely controlled environments and professionals are often faced with various barriers in optimizing the administration of cognitive tests to individuals with sensory deficits. Clinicians admit that they use their past clinical experience more so than evidence-based research as a guide during clinical decision-making (85,86). A significant number of OTs report dismissing empirical evidence to complement their clinical practice (87). In addition, OTs report low competency about sensory impairment in general and expressed a lack of education on topics such as hearing, visual and dual sensory impairment rehabilitation as well as cognitive rehabilitation (80,88).

Consequently, it is imperative to inquire about what is currently being conducted in clinical practice regarding cognitive screening procedures in clients living with sensory impairment(s). The aim of this study was to explore the various adaptations and accommodations that Canadian occupational therapists employ when administering cognitive screening tests to individuals with HI

(D/deaf or hard-of-hearing), VI or DSI. We investigated whether practicing OTs judge themselves as equipped with strategies to accommodate for sensory impairment(s) during cognitive screening, and if they feel the necessity to improve their clinical knowledge about providing services to clients with sensory difficulties. Overall, we expected great variability in the strategies reported by clinicians. We hypothesized that clinicians would feel less satisfied with their own ability to deliver services to individuals with DSI, compared to clients with only VI or HI. Although we expected self-rated satisfaction of service ability to be correlated with the number of reported strategies, these two variables would not differ as a function of geographical location. However, OTs who had been working in the profession for longer and had more professional experience and those who had been working in long-term care homes were expected to demonstrate better service ability satisfaction and greater number of reported strategies.

Methods

The study protocol received ethical approval by *Clinical Research Ethics Committee* of the Université de Montréal (#2021-1252).

Study Design

Using a cross-sectional on-line survey, we recruited a convenience sample of Canadian OTs working with individuals with VI, HI or DSI. This study design allowed to explore the frequency of reported strategies across currently practicing OTs by recruiting from a large pool of potential participants. A previous study successfully employed this approach to recruit OTs across Canada (88).

Participants & Recruitment

Practicing OTs who administer cognitive screening tests to individuals with sensory impairment of any age were eligible to participate. They were recruited through their respective provincial regulatory bodies as well as national clinical and research organizations such as the

Canadian Association of Occupational Therapists, as well as the *Canadian Consortium on Neurodegeneration in Aging* (*CCNA*). Various online means of distribution were used including emails, newsletters, official websites advertisement and social media such as Twitter. Fluency in reading and responding in English or French was required to complete the questionnaire. Exclusion criteria comprised clinicians that were not currently practicing or those who had never administered a cognitive screening test to individuals where they were aware that they were living with HI (whether D/deaf or hard-of-hearing), VI or DSI.

Study Instrument

Development. Two members of the research team (SD and WW) developed the initial questionnaire in English inspired by the *Knowledge, Attitudes, and Practices (KAP) Survey Model* (89) and the empirical literature on cognitive evaluation in people with sensory impairment. The survey was reviewed and pilot-tested by ten members of Team 17 of the *CCNA*, a national network of sensory-cognitive research experts and trainees with the common goal of contributing to research on age-related neurodegenerative sensory and cognitive conditions and comorbidities (90). Taking this feedback into consideration, an updated version of the survey was finalized and translated to French by a bilingual team member (SD).

Final survey. The final survey comprised 22 questions divided in three sections and required between five and ten minutes to complete. The first section included two statements assessing eligibility to participate in the study. Participants who were eligible and provided consent then completed the second section of the survey. This section contained Likert-scale and multiple-choice questions regarding cognitive tool use, clinical service ability satisfaction, test administration strategies and educational interest. The complete questionnaire in both English and French is available in Supplementary materials 1 and 2. Participants were given the opportunity to

insert additional answers beyond the provided choices. Demographic questions were asked about participants' age, sex, gender, geographical location, and professional specialization.

Data collection

The student leader of the project created an online version of this survey using the web based *LimeSurvey* service (91) where the data were confidentially collected and stored. The distribution of the survey through the different professional associations initiated on December 1st, 2021. Interested participants had the opportunity to complete the survey before March 22nd, 2022.

Data analysis

The survey data were imported into a master *Microsoft Excel* sheet where all participant data were compiled after the completion of data collection. This spreadsheet was coded to facilitate data interpretation for statistical analyses. The *JASP* statistical software (92) was used for data analyses, using descriptive, parametric and non-parametric approaches, as appropriate.

Results

Statistical analyses of ordinal variables were conducted using Friedman's analyses of variance (ANOVA), Wilcoxon's Signed Rank tests, Spearman's Rank-Order correlations as well as Kruskal-Wallis tests. Effect sizes were expressed using Cohen's *d*, rank-biserial correlations (*r*) and partial eta squared (η_p^2).

Response Rate

Recruitment of OT's was challenging given the ongoing COVID-19 pandemic where healthcare professions experienced delays in the provision of services as well as an increased workload. Provincial professional associations and orders for Canadian OTs in six provinces (Ontario, Quebec, Alberta, Saskatchewan, New Brunswick & Manitoba) were contacted by email and agreed to support the distribution of the participation invitation for this study. The Canadian Association of Occupational Therapists agreed to support this study nationally. Proportional

response rates could not be accurately calculated because the number of active OTs reached by each provincial professional order was unknown. The data from three provinces (British Columbia, Alberta and the Canadian territories) were removed from the dataset due to their respective sample size (n = 1) being too small to perform statistical analyses.

Characteristics of survey respondents

Complete demographic information about the participants is available in Table 4. A total of 87 practicing OTs completed the survey from the provinces of Quebec (QC; n = 66) and Ontario (ON; n = 21), M_{age} = 42.74, sd_{age} = 9.11, $range_{age}$ = 26-63. Overall, 40% of OTs had been working in the profession for more than 20 years (n = 35). Participating clinicians practiced in various settings such as public hospitals (n = 38), rehabilitation centers (n = 19), long-term care facilities or nursing homes (n = 13), public (n = 8) or private clinics (n = 6), and other settings including local community service centers or in-home care (n = 22). Fifteen OTs were working across two different settings at the time of the survey and two were working across three settings. In our sample, most OTs worked primarily with older adults (geriatrics; n = 37).

Reported cognitive screening tools

The most frequently reported cognitive screening tools used by OTs included the *MoCA* (21) (n = 82) and the *MMSE* (31) (n = 66) to screen the cognitive function of their clients with sensory impairment (see Table 5 for a complete list of measures). Noting self-reported cognitive complaints from their clients was the third most reported measure of cognition (n = 24) followed by the use of cognitive sub-tests (n = 19). Only three clinicians reported the use of tests adapted for sensory impairment: the *MoCA* in its blind (47) (n = 1) and hearing-impaired (93) (n = 1) versions as well as the *COGnitive Evaluation in VISual impairment* (COGEVIS; n = 1). Other reported cognitive tools included the *Cognitive Assessment Scale for the Elderly (CASE)* (94) (n =7), the

Rowland Universal Dementia Assessment Scale (RUDAS) (95) (n = 6), as well as clinical and functional observations.

Self-rated satisfaction of service ability

OTs were asked to rate their overall satisfaction with their own ability to deliver services to individuals with VI, HI and DSI using a 5-point Likert scale (1 = extremely unsatisfied, 5 = extremely satisfied). A Friedman's test was performed to compare the effect of the clientele's sensory status on clinical competence. There was a statistically significant difference in OTs' satisfaction with their ability to provide services to the three sensory impairment groups (X^2_F (2) = 61.13, p < .001). Post-hoc tests using a Wilcoxon signed-rank test with a Bonferroni adjustment showed that participants reported no statistically significant difference in their perception of service ability when providing services to VI (M = 3.06, SD = 0.94) and HI clients (M = 3.03, SD = 0.83), Z = .329, p = .72, d = -0.06. Clinical satisfaction was however statistically significantly lower when interacting clients living with DSI (M = 2.32, SD = 0.91) compared to the VI and HI sensory impairment groups, VI-DSI: Z = 127, p < .001, d = -0,83; and HI-DSI: Z = 101, p < .001, d = -0.86, respectively. Only three professionals felt extreme satisfaction in their healthcare ability with individuals with VI while none declared the same for clients with HI and DSI. A greater number of participants were extremely unsatisfied with their service ability to individuals with DSI (n = 19) compared to VI (n = 7) and HI (n = 4).

Accommodation strategies used during cognitive screening test administration

All sensory conditions combined, clinicians reported a varied number of strategies they utilize during cognitive screening tests, ranging between 8 and 41 (*mode* = 16).

Accommodations for clients with visual impairment. Overall, clinicians reported using between 2 and 12 strategies (*mode* = 6) during the administration of cognitive tests to individuals with VI. The most reported accommodation used during the administration of cognitive screening

tests to individuals with VI was to encourage clients to use their own visual aids during test administration. Over 95% (n = 83) of the sample implemented this strategy in their practice. Ensuring that the lighting in the room was adequate for reading was an environmental strategy that was identified by 73 clinicians. To screen the client or to inquire about their visual function with a subjective assessment before performing the test was the third most reported strategy (n = 61). See Table 6 for the complete list of strategies for working with this sensory group.

*Accommodations for clients who are hard-of-hearing***.** Clinicians reported a larger range of reported strategies (*range* = 0-12, *mode* = 7) with clients who were hard-of-hearing but were still able to use spoken communication compared to clients with other sensory profiles. A similar pattern of identified strategies for VI was identified. Again, the promotion of the client's wearing of hearing aids was a prominent strategy (n = 85) and assuring a noiseless environment (n = 84) were two important actions undertaken as well as ensuring slow and clear speech with an appropriate tone (n = 83). See Table 7 for the complete list of strategies for this sensory group.

Accommodations for clients who are D/deaf. The number of reported strategies decreased when OTs face individuals who were D/deaf, including those who used sign language (*range* = 0-12, *mode* = 1). In this case, the top accommodative strategies stated were ensuring face-to-face communication to promote lip- and speech-reading (n = 40), encouraging the use of hearing aids (n = 33), and speaking at a slower, clearer pace with an appropriate tone (n = 31). See Table 8 for the complete list of strategies for working with this sensory group.

Accommodations for clients with dual sensory impairment. The smallest number of strategies was reported with clients who have DSI (*range* = 0-9, *mode* = 3). Encouraging clients to wear their visual and hearing aids was a noted recommendation (n = 62). When and if these were not available, professionals suggested that they would subjectively screen the visual and hearing

functions of their clients (n = 54) and/or offer them assistive technology while they perform the cognitive test (n = 41). See Table 9 for the complete list of strategies for this sensory group.

Self-rated service ability and reported number of strategies based on location

A Spearman's rank correlation was computed to assess the relationship between the self-rated satisfaction of clinicians' service ability to clients of each sensory impairment group and the number of reported strategies for each respective sensory group of clients. There was no correlation between the number of strategies reported during the cognitive screening of individuals with VI and how satisfied OTs felt with their service ability with this clinical population, $r(85)$ = .17, p = .118, 95% CI [-0.04, 0.37]. Similarly, there was no correlation between the number of strategies with clients who are D/deaf and the self-rated satisfaction with clients with HI, $r(85)$ = .17, p = .121, 95% CI [-0,05, 0.37]. These analyses suggest that, for these clients, the number of reported strategies varies independently from the self-perceived service satisfaction of OTs. Statistically significant correlations were identified between satisfaction and clients who are hard-of-hearing ($r(85)$ = .25, p < .05, 95% CI [0.04, 0,43]) as well as between satisfaction and clients with DSI (r(d85) = .34, p < .05, 95% CI [-0.14, 0.52]), suggesting that an increase in the use of strategies is correlated with an increase in self-perceived satisfaction with these two clienteles. See Tables 10 and 11 for complete data distribution of these variables.

Effect of location and self-rated service ability satisfaction, as well as the reported number of strategies based on location

Mann-Whitney t-tests indicated that clinicians' satisfaction scores of working with the three sensory impairment groups did not differ between OTs working in QC versus in ON: VI: U= 768.5, p = .427, r = .11; HI: U= 714, p = .827, r = .03; DSI: U= 763.5, p = .466, r = .10, respectively. Similarly, there were no differences between the two provinces on the number of strategies implemented by OTs: with clients with VI (U= 785, p = .36, r = .13), clients who were

hard-of-hearing (U= 806.5, p = .251, r = .16), D/deaf (U= 756.5, p = .524, r = .09) and those living with DSI (U= 700.5, p = .944, r = .01), respectively.

Effect of career duration and self-rated service ability satisfaction as well as the reported number of strategies

Between-groups ANOVAs (Kruskal-Wallis H tests) demonstrated that service satisfaction did not differ as a function of how long OTs had been working in the profession. This applied to all sensory impairment groups (VI = F (3,83) = 0.87, p = .459, η_p^2 = .031; HI= F (3,83) = 1.04, p = .378, η_p^2 = .036; DSI = F (3,83) = 0.11, p = .952, η_p^2 = .004). Furthermore, no significant statistical difference was observed among the number of strategies reported for clients with VI (F (3,83) = 2.48, p = .066, η_p^2 = .082), those who are hard-of hearing (F (3,83) = 2.62, p = .056, η_p^2 = .086; H (3) = 8.04, p = .045), those who are D/deaf (F (3,83) = 0.49, p = .692, η_p^2 = .017) or those living with DSI = F (3,83) = 1.69, p = .176, η_p^2 = .058).

Effect of work setting and self-rated service ability satisfaction as well as the reported number of strategies

Self-rated service ability satisfaction for each sensory impairment group did not statistically differ across the different settings in which the OTs were working (VI = F (3,70) = 0,41, p = .750, η_p^2 = .017; HI = F (3,70) = 0.53, p = .665, η_p^2 = .022; DSI = F (3,70) = 0.34, p = .800, η_p^2 = .014). Furthermore, no difference in the number of strategies reported was observed for any of the sensory conditions, VI = F (3,70) = 0.92, p = .435, η_p^2 = .038; hard-of-hearing= F (3,70) = 0.28, p = .839, η_p^2 = .012; D/deaf = F (3,70) = 0.69, p = .559, η_p^2 = .029; DSI = F (3,70) = 0.91, p = .442, η_p^2 = .037.

Continuing education needs about cognitive screening tests in individuals with sensory impairment

Clinicians who reported not accommodating for the needs of individuals with a vision impairment (n = 3) or those that are deaf or hard-of-hearing (n = 5) were asked which accommodations for sensory impairment they would like to learn more about to enhance cognitive test administration. All of them were interested in increasing their knowledge about potential test adaptations for sensory impairments that can be implemented to already existing and available cognitive evaluation tools. All participating OTs were asked which accommodations for DSI they would like to learn more about. For this question, communication strategies (n = 77) and test adaptations to existing cognitive screening tests (n = 75) were the most selected strategies. Only one OT in the sample felt no need to learn about supplementary strategies with clients with DSI. See Table 11 for the complete data.

Discussion

The purpose of this study was to survey occupational therapists on the strategies that they implement in practice to accommodate for sensory impairment during the administration of cognitive screening tests. In addition, we explored their level of satisfaction with their own service delivery abilities with this clientele. The resulting data distribution of the reported strategies with each sensory group (VI, HI, DSI) suggest great variability in the reported strategies. OTs reported a mixture of client-centered, communication, environmental strategies in different proportions. These results are thought-provoking if we consider that both service ability satisfaction and the number of reported strategies did not differ as a function of province, work setting or career duration for all sensory clienteles. It was expected that the variability of the reported strategies would reflect differences in satisfaction and the number of reported strategies. As this is not the case, we must further inquire about the decision-making process of clinicians and what factors incline them to favor a strategy over another.

We initially speculated that OTs with more professional experience would indicate greater clinical satisfaction and number of reported strategies when dealing with all clients presenting with sensory impairment. The rationale behind this hypothesis was that OTs have previously reported using their clinical experience as a major guide in clinical decision-making (96). As a result, they would have developed more strategies with the clinical populations of interest over the course of their career. However, the survey data contradicted this assumption suggesting similar levels of competence across all levels of professional experience. These results speak to the variability and the unpredictability of sensory deficits and the importance of individualized services for such clients. Therefore, OTs should increase their continuing education opportunities on optimal service delivery to clinical groups presenting with complex profiles.

Sensory impairment and cognitive decline are prevalent conditions in long-term care facilities (50,97). Furthermore, aging and co-morbid conditions are risk factors for the developments of VI, HI and cognitive dysfunction (98–100). The patient population in long-term care homes mostly consists of older individuals with chronic and/or co-morbid illnesses (101). Consequently, we expected OTs working in that setting to be more proficient with clients living with sensory impairment as they frequently deliver services in this environment. However, this was not the case because similar ratings of service ability were observed across settings. This finding suggests that the diversity of the patient population is comparable in hospitals, clinics, long-term care homes, and other settings and does not have an effect on clinical decision-making. This result is significant because it entails that all OTs should have universal knowledge about the sensory-cognitive association and how to address it with their clients.

Over 86% of OTs expressed their interest in learning about test adaptations for existing cognitive screening/assessment for DSI. All of the OTs who reported not accommodating for separate vision and separate hearing impairments expressed the same enthusiasm for vision and

hearing sensitive tests. To our knowledge, the only potential cognitive tools adapted to DSI that have been proposed in the literature are tactile tests (35–37). However, these have not been standardized and validated for implementation in clinical practice, and it remains unsure if they are sensitive and/or reliable enough to detect cognitive dysfunction. Therefore, it is meaningful to explore evidence-based strategies for cognitive screening tests that are already used in practice. Such feasible adaptations could improve the sensibility and sensitivity of cognitive tests with individuals with VI and/or HI and potentially decrease clinical misjudgment. These expressed interests could motivate the development and dissemination of standardized and evidence-based alternative strategies to be disseminated to clinicians through knowledge transfer and translation and continuing education activities.

As mentioned in the previous chapter, DSI is a complex condition that potentially multiplies the detrimental effect on the functioning of the individual (34). DSI can be expressed in different degrees of severity of VI and HI, ranging from partial to complete blindness and/or D/deafness, and research is still ongoing to meticulously and universally define DSI (102). Moreover, depending on the etiology of the DSI and the onset of the vision and hearing decline, the communicative ability of the affected individual is variable (33). OTs must navigate this heterogenous clientele in their work. This complexity is reflected in clinical practice where significant lower ratings of service ability satisfaction are observed in OTs with clients with DSI. OTs also reported the least number of strategies when conducting cognitive screening tests with individuals with DSI, further strengthening this perception. When reported, a very minimal number of clinicians made use of communication strategies such as using sign language, braille reading material, fingerspelling, or tactile tests. These means of communication require a considerable amount of time, resources and energy which may not be feasible and/or available in daily practice. This lack of proficiency may explain why the most reported topic of interest for

future learning on cognitive screening tests in individuals with DSI relates to communication strategies. The most reported strategies were client-centered (i.e., wearing visual/hearing aids, screening for visual/hearing function, providing assistive technology), suggesting a transfer of responsibility for effective communication to the client. This is problematic since it cannot be assumed that clients have the self-awareness of their levels of sensory impairment (103). Also, it cannot be assumed that they have been provided with the necessary assistive devices and proper training to efficiently use those tools, which could further contribute to the reduced integrity of test performance. In these cases, a shift of responsibility to clinicians could be favorable.

Limitations

The first limitation of this study is that our sample participants only consisted of OTs. There are other healthcare specialists who administer cognitive screening tests in their practice such as family physicians, nurses, psychologists, and others. These professions vary in their educational curriculum and in their scope of work. The results of the current clinical survey only depict a certain portion of healthcare workers and cannot be generalized to the complete healthcare environment. Therefore, in order to describe a more comprehensive picture of current practice, it is necessary to also inquire into the cognitive screening practices of these other professions. Furthermore, it would be pertinent to compare the strategies reported in each profession to learn more about the discrepancies within clinical practice. By those means, specialized knowledge translation methods would be promoted in a way that is applicable and relevant for the different fields of work. Additionally, we excluded OTs who had never administered a cognitive screening test to individuals where they knew they were living with sensory impairment. In actuality, OTs may not always be aware of the sensory profile of the clients to which they deliver services. The perspective of these clinicians who were ruled out of our study should be considered. It would be valuable to explore how they adapt to clients who present themselves with sensory impairment

without prior knowledge of their sensory function and what actions are then undertaken for specialized provision of care.

The second limitation of this study is that there is an undeniable lack of depth in the answers provided by OTs due to the multiple-choice nature of the questionnaire. Being prompt with answer choices may have engendered cognitive biases during responses and may have resulted in data inflexibility. In order to recruit a maximum number of OTs in a realistic timeframe, we opted for a very short questionnaire that would give us just enough information to identify a knowledge-to-practice gap. However, in-depth interviews could have been better means in acquiring this information as the OTs would have had the opportunity to provide context to their responses.

A third limitation is that sensory impairment and the three identified sensory groups (VI, HI and DSI) are used very generally. It is evident that these conditions have different etiologies and occur with variable levels of severity. Individuals with sensory impairment present a highly heterogeneous population and grouping them so broadly is not accurate. Interventions for these individuals should be individualized based on not only their sensory function, but also on their needs, without neglect of co-morbid conditions.

Finally, in order to limit the length of the survey, only clinicians who did not accommodate for VI or HI during test administration were asked about their interest in learning about accommodations for these sensory impairments. As a result, we do not know whether clinicians who did report employing strategies feel the need to acquire knowledge on further accommodations for test administration. Such data would further clarify the needs for future continuing education topics.

Conclusion

Sensory deficits may be underdiagnosed or misdiagnosed in individuals with cognitive impairment (104). Consequently, addressing sensory impairment is often overshadowed by

cognitive impairment (105,106). To avoid such ambivalence, several studies have explored the development of vision- and hearing-independent cognitive screening tests. Although these tests are readily available and have been empirically validated, the present study results demonstrated that most OTs fail to make use of such resources for their clients with these sensory deficits, perhaps as a consequence of unavailability. Instead, OTs seem to employ inconsistent strategies, hinting as a gap in knowledge transfer and translation. We must determine why evidence-based data that could equip OTs did not effectively transfer over into their practice. For D/deafness and DSI, the literature falls short of validated cognitive measures. We must then turn to research and evidence-based guidelines to enrich clinical knowledge and training and facilitate cognitive test administration for populations with sensory impairment.

General conclusion

The two studies presented in this manuscript uncovered a knowledge-to-practice gap between evidence-based and practical strategies to accommodate sensory impairment during cognitive test administration. In the scoping review, the responsibility of accommodating test procedures for older adults with DSI was generally directed by the expertise of specific healthcare professionals. Strategies that would be more controllable by the test administrator such as communication and environmental strategies were overlooked. When we explored occupational therapy practice, we observed a complete shift of strategies. In real practice, external resources such as sign-language interpreters, specialists in DSI or professionals trained in sensory impairments (psychologists, nurses, etc.) are often not immediately available. This experience manifested lower satisfaction of self-perceived service ability in OTs, especially when working with clients living with DSI. This diminished satisfaction explains that the inclusion of experts for assistance is a resourceful strategy.

The problem that arises from this situation is that OTs may not feel that they possess the competency to optimally administer cognitive screening tests to their clients with sensory impairment. For that reason, they appear to make use of client-centered strategies such as encouraging their clients to wear their aids or asking them to self-report their sensory function. To augment the parameters of their interactions with their clients with sensory impairment, they also make an effort of controlling modifiable aspects such as communication and environmental strategies. However, the data demonstrate that they do not make use of these strategies in a systematic way. It is unknow whether our respondents received the proper training for implementing sensory-appropriate alternatives during test administration. Therefore, we cannot confirm that such strategies do not compromise the integrity of the cognitive test used.

More insight into the clinical decision-making process of OTs when interacting with clients with sensory impairment is necessary to conscientiously illustrate their current state of practice. Semi-structured interviews, focus groups or extensive surveys depicting case scenarios are valuable methodological designs to gain more insight on the issue at hand. This procurement of information will promote an active exchange between clinical and research settings. Thereafter, knowledge transfer activities can be conducted in which evidence-based research findings are disseminated to clinicians in order to increase their clinical knowledge, ability, and proficiency. Continuing education, courses offered to healthcare workers to update them on healthcare advancements, could serve as great diffusion channels. It could also be worthwhile to include the perspectives of clients with sensory impairment with lived experience of cognitive test administration to gain insight on their perspective and their needs.

Other future directions could include the development, standardization, and validation of tactile cognitive tests for DSI. During the development of such tools, it would be recommended to implicate an interdisciplinary team including neuropsychologists, speech-language pathologists, geriatricians, experts on sensory impairment, OTs, nurses, and others. Researchers must also conduct validation studies including participants of varied sensory and cognitive profiles. Furthermore, the sensitivity and specificity of the proposed tests, their ability to detect the presence or the absence of cognitive dysfunction, should be evaluated before implementation in practice. Eventually, the screening tools should also be compared to currently used, standardized, and validated measures.

OTs are assigned to the rehabilitation of the functional dependence of individuals with various health conditions. They comprehensively evaluate their clients after consideration of their co-morbid health conditions. Professions rooted in primary care such as physicians, may not have the resources to evaluate their patients with a global perspective. Therefore, implementing

occupational therapy, or other vision and hearing rehabilitation professions, in primary care could positively contribute to the prevention, management, and rehabilitation of disabilities. These global risk assessments provide a post-hoc interpretation of the function and independence of clients with disabilities and could reinforce integrated healthcare. Sensory impairment is an important risk factor for cognitive decline that impedes on the quality of life of the person affected (19,34,50). As a result, educating OTs and other sensory rehabilitation professionals on how to optimally be pro-active in the detection of cognitive dysfunction of individuals with sensory impairment would contribute to adequate service ability and subsequent increased quality of life.

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Table 1: *Scoping review inclusion and exclusion criteria*

Abstract and title screening	
Include	Exclude
- Studies that consider the cognitive status of the individuals with hearing and/or visual impairment with standardized cognitive tests in their methodology. This includes studies that assess/measure cognitive domains such as short & long-term memory, executive function, processing speed, language and verbal skills, etc. - Studies that consider participants with sensory loss (visual impairment, hearing impairment, dual sensory impairment). It is not mandatory that all participants have hearing and/or visual impairment. - Studies that also explore modifications to cognitive screening tests to accommodate for sensory loss but may not include participants with sensory loss. - Studies that include older adults in their participants (65+). It is not mandatory that all participants are older adults.	- The cognitive function of individuals with hearing and/or visual impairment is not considered i.e these sensory impairments were not variables in the studies. - The study participants do not have hearing and/or visual impairment - The study participants are not aged 65 and older - The study focuses only psychological/mental health aspects (i.e., depression, anxiety) - Dual sensory impairment (if applicable) is about other senses than hearing and vision - Animal model studies - Editorials, comments, conference publications, academic thesis/dissertations, books or letters.
Full text review	
- Study sample must include at least one participant with dual sensory impairment.	- Articles that are not written in English, French, Portuguese and German

Table 2: *Example of a search strategy*

Concept	#	Searches	Results
	1	exp Neuropsychological Tests/	182118
	2	((neuropsychologic* or neuro-psychologic* or Behavioral or Psychiatric or neuropsychiatric* or neuro-psychiatric* or memory or Bender-Gestalt or Bender Visual Motor Gestalt Test or language or Hooper Visual Organization or Controlled Oral Word Association or Continuous Performance or clock or Symbol Digit Modalities or vocabulary or Boston Naming or Paced Auditory Serial Addition or "Tower of London" or aphasia or developmental or Learning or Mental Navigation or stroop or trail making or Halstead Category or Seashore Rhythm or Speech Sounds Perception or Tactual Performance or Wisconsin Card Sorting) adj2 (test* or assess* or exam* or task* or status* or battery or interview* or scal*)).tw.	144477
	3	((Cognitive* or mental or dementia or neurocogniti* or neuro-cogniti* or alzheimer) adj (screening or Function? or test* or impair* or status* or scal* or decline? or assess*)).tw.	159162
	4	(AX-CPT or CPT or NEPSY or CANTAB or TOMAL or FCRS or M-WCST or WCST or MMSE or MOCA or CPS or GPCOG or UPDRS Panel? or COGNISTAT or CDR or ADRDA).tw.	45123
	5	(Delis-Kaplan Executive Function System or "Test of Everyday Attention" or Rey-Osterrieth Complex Figure? or stroop effect? or stroop paradigm? or Halstead-Reitan Battery or "Test of Memory Malingering" or "Alzheimer's Disease and Related Disorders Association").tw.	2359
	6	((Wechsler Memory or Wittenborn or Factor Construct Rating or Edinburgh Postnatal Depression or Katz Adjustment?) adj1 scal*).tw.	4051
	7	("Assessment of Cognition" or Mini Mental State Examination? or Unified Parkinson's Disease Rating Scale or Mini-Cog or MiniCog or Dementia Rating? or MicroCog or Micro-Cog).tw.	20589
A	8	1 or 2 or 3 or 4 or 5 or 6 or 7	430716
	9	exp Deaf-Blind Disorders/	1123
	10	((sensory or sensation) adj (impair* or loss* or disorder? or deficienc* or dysfunction? or defect? or handicap*) adj10 (dual or double or multi or multiple)).tw.	320
	11	(Sensation Disorders/ or (exp Hearing Disorders/ and exp Vision Disorders/)) and (dual or double or multi or multiple).tw.	948
	12	(((vision or visual*) adj (impair* or loss* or disorder? or deficienc* or dysfunction? or defect? or handicap*) adj10 (dual or double or multi or multiple)) and ((hearing or auditory or auditive) adj (impair* or loss* or disorder? or deficienc* or dysfunction? or defect? or handicap*) adj10 (dual or double or multi or multiple))).tw.	49
	13	(Deaf* and blindness* and (dual or double or multi or multiple)).tw.	124

	14	(dual impairment? or dual dysfunction? or "hearing and vision loss*" or "Vision and Hearing Loss*" or deafblind* or deaf-blind* or Deafness Blindness or Blind-Deaf* or Deaf-Mutism-Blind or "hearing and visual impairment?" or "hearing and visually impaired" or "hearing and visual disability" or "hearing and visual disabilities" or "hearing and visually disabled" or "vision and hearing impairment?" or "visually and hearing disabled" or "vision and hearing disability" or "vision and hearing disabilities" or "vision and hearing dysfunction" or "vision and hearing defect").tw.	1124
	15	(((Usher or Hallgren or Wolfram) adj Syndrome?) or Dystrophia Retinae Pigmentosa-Dysostosis Syndrome? or Retinitis Pigmentosa Deafness Syndrome? or Deafness-Retinitis Pigmentosa Syndrome? or (Retinitis Pigmentosa and Congenital Deafness*)).tw.	1701
B	16	9 or 10 or 11 or 12 or 13 or 14 or 15	3855
	17	exp aged/ or Housing for the Elderly/ or Homes for the Aged/ or Senior Centers/ or Adult Day Care Centers/ or Healthy Aging/	3239641
	18	(aged or old or older or elder* or frail or ageing or aging or senescence or "over 65" or "over 80" or "65 year*" or "85 year*" or Nonagenarian? or Octogenarian? or Centenarian? or ((retirement or senior?) adj (center? or centre? or home?))).tw.	2315414
	19	Health Services for the Aged/ or Geriatrics/ or geriatric assessment/ or Geriatric Psychiatry/ or Geriatric Nursing/ or Geriatric Dentistry/	87523
	20	(geriatr* or psychogeriatr* or sociogeriatr* or Geronto* or Beers Criteria).tw.	60344
	21	((elder* or aged) adj2 (care or caring or healthcare or (Health adj (Service? or centre? or center? or facilt* or institution?)) or hospital or clinic? or institutionali#ed)).tw.	13650
C	22	17 or 18 or 19 or 20 or 21	4898433
A and B and C	23	8 and 16 and 22	175
A and B and C limited	24	limit 23 to (english or french or german or spanish)	168

Table 3: *Results of individual sources of evidence*

#	References	Vision measures used	Hearing measures used	Cognitive evaluation tool(s) used	Reported adaptation(s) to cognitive test administration
1	(107)	- Near-vision Rosenbaum card	- Whisper test	- Mini Mental State Examination (MMSE)	-
2	(108)	- Self-report	- Self-report	- Neuropsychological test battery - Clinical Dementia Rating (CDR)	-
3	(109)	- Self-report	- Self-report	- Two self-assessed measures of cognitive function (trouble remembering and frequency of confusion)	-
4	(110)	- Bailey–Lovie distance visual acuity test - Pelli–Robson contrast sensitivity test	- Pure tone average	- Mini Mental State Examination (MMSE)	-
5	(35)	Not reported	- Not reported	- Tactile test battery	1. **Tests that do not include visual/audio items** (tactile test) 2. **Targeted team of experts** (deafblind consultants) 3. **Communication strategies** (instructions given in tactile sign language, spoken language, by use of written texts or other communicative means)
6	(48)	- Self-report	- Self-report	- Korean version of the Consortium to Establish a Registry for Alzheimer's Disease (CERAD-K)	1. **Targeted team of experts** (geriatric psychiatrist, clinical psychologist, and a nurse)
7	(49)	- Medical case records - Self report	- Medical case records - Self report	- Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE)	1. **Targeted team of experts** (deafblind consultant)
8	(111)	- Resident Assessment Instrument-Home Care (RAI-HC)	- Resident Assessment Instrument-Home Care (RAI-HC)	- Cognitive Performance Scale (CPS)	-
9	(64)	- Self-report	- Self-report - Observation	- Four cognitive sub-tests (unnamed)	1. **Communication strategies** (Participants were assessed with their visual and hearing aids if they had them.)
10	(112)	- Self-report	- Self-report	- Diagnosis - ICD-9 dementia diagnosis codes	-
11	(29)	- Snellen far visual acuity	- Audiometric evaluation (Words-in-noise test)	- Montreal Cognitive Assessment-Blind (MoCA-Blind)	1. **Modified scoring procedures** (eliminating visual items from the MoCA)
12	(113)	- Self-report	- Self-report	- American Community Survey (ACS)	-
13	(114)	- Snellen chart	- Audiometric evaluation (Pure tone thresholds test)	- Telephone Interview for Cognitive Status (TICS)	-
14	(115)	- Early Treatment Diabetic Retinopathy Study	- Pure-tone audiometry - Self-report	- Mini Mental State Examination (MMSE)	-

		(ETDRS) chart - LogMAR chart			
15	(116)	Not reported	-Pure- tone average	- Mini Mental State Examination (MMSE)	-
16	(117)	- Electronic Visual Acuity test - Pelli-Robson chart - Medical records	- Self-report	- Mini Mental State Examination (MMSE) - Trails B (paper and pencil test) - Visual Closure Subtest of the Motor Free Visual Perception Test	-
17	(118)	- Kombinert Alvorlig Sansesvikt (Combined Serious Sensory Impariment; KAS) Screen - interRAI (Resident Assessment Instrument) Acute Care (AC)	- Kombinert Alvorlig Sansesvikt (Combined Serious Sensory Impariment; KAS) Screen - interRAI (Resident Assessment Instrument) Acute Care (AC)	- Cognitive Performance Scale (CPS)	-
18	(50)	- Deafblind Severity Index (DbSI) - Resident Assessment Instrument-Home Care (RAI-HC) - Resident Assessment Instrument–Minimum Data Set 2.0 (RAI-MDS)	- Deafblind Severity Index (DbSI) - Resident Assessment Instrument-Home Care (RAI-HC) - Resident Assessment Instrument–Minimum Data Set 2.0 (RAI-MDS)	- Cognitive Performance Scale (CPS)	1. **Targeted team of experts** (registered nurses)
19	(51)	-Deafblind Severity Index (DbSI) from the Resident Assessment Instrument-Home Care (RAI-HC)	- Observation	- Cognitive Performance Scale (CPS)	1. **Targeted team of experts** (registered nurses and social workers)
20	(52)	- Deafblind Severity Index (DbSI) from the Resident Assessment Instrument-Home Care (RAI-HC)	- Deafblind Severity Index (DbSI) from the Resident Assessment Instrument-Home Care (RAI-HC)	- Cognitive Performance Scale (CPS)	1. **Targeted team of experts** (registered nurses)
21	(119)	- The lighthouse international chart	- Otoscopic examination - Screening tympanometry	- Mini Mental State Examination (MMSE)	-

		- Tumbling E (for participants unable to read or write)	- Air and bone conduction hearing thresholds - Pure-tone hearing thresholds.		
22	(65)	- Distance visual acuity chart - Self-report	- Audiometric assessment of both ears - Self-report	- Four cognitive sub-tests (1. Counting Backwards from 100 for 30 seconds; 2. Digit Span Backwards subtest of the German version of the revised Wechsler Adult Intelligence Scale WAIS–R; 3. Animal Naming; 4. subtest Similarities taken from the German WAIS–R)	1. **Tests that do not include visual/audio items** (tests administered verbally only) 2. **Communication strategies** (speak slowly, clearly, and loudly, ask for feedback during conversation) 3. **Environmental strategies** (testing took place in very quiet room)
23	(61)	- LogMAR chart - Distance visual acuity chart - Pinhole acuity - Early Treatment Diabetic Retinopathy Study	- Pure-tone audiometry	- Mini Mental State Examination-Blind (MM-Blind)	1. **Modified scoring procedures** (excluding vision-related items of the MMSE)
24	(53)	- Self-report	- Self-report	- Mini Mental State Examination (MMSE) - Clinical Dementia Rating (CDR) - Modified Mini-Mental State Examination (3MSE) - Cognitive subscale of the Alzheimer's Disease Assessment Scale (ADAS-Cog) - Neuropsychological battery of tests	1. **Targeted team of experts** (adjudication committee for dementia classification)
25	(120)	- Lighthouse Near Visual Acuity Test	- Whisper test	- Mini Mental State Examination (MMSE)	-
26	(121)	- Early Treatment Diabetic Retinopathy Study Chart - Groningen Edge Contrast cart - Friedman Visual Field Analyzer - Ability to read text	- Pure-tone air conduction audiometry	- Mini Mental State Examination (MMSE) - Cognitive subtest (short-term memory test derived from the verbal learning test)	-
27	(122)	- Visual acuity - Self-report	- Pure-tone audiometry	-Mini Mental State Examination (MMSE)	-
28	(123)	Not reported	- Self-report	- Mini Mental State Examination (MMSE)	-
29	(124)	- Self-report	- Self-report	- Diagnosis - Self-reported diagnosis information - Measured cognitive	-

				performance in 3 domains (unnamed)	
30	(125)	- Early Treatment of Diabetic Retinopathy Scale (ETDRS)	- Pure tone audiometry	- Mini Mental State Examination (MMSE)	-
31	(126)	- Self-report	- Self-report	- 22-item Neurobehavioral Symptom Inventory (NSI-22)	-
32	(127)	- Self-report	- Self-report	- Modified version of the cognitive score developed by Batty, Deary, and Zaninotto (2016) referring to working memory and executive function	-
33	(128)	- Binocular visual acuity - Bailey Lovie Targets	- Hand-held audiometer	- Modified version of the Mini Mental State Evaluation (3MS)	-
34	(129)	- Self-report	- Self-report	- Mini Mental State Examination (MMSE)	-
35	(130)	- Self-report	- Self-report	- Validated instruments (unnamed)	-
36	(131)	- Early Treatment Diabetic Retinopathy Study (ETDRS)	- Pure-tone audiometry - Air-conductiong threshold	- Montreal Cognitive Assessment (MoCA)	-
37	(7)	- Self-report	- Self-report	- Three surveys (unnamed)	-
38	(66)	- Self-report	- Self-report	- Telephone Interview for Cognitive Status (TICS) - Three cognitive sub-tests (episodic memory, serial 7s, backward counting)	1. **Tests that do not include visual/audio items** (The TICS is administered over the phone and does not include visually presented items).
39	(54)	- Self-report	- Self-report	- Functional assessment (unnamed)	1. **Targeted team of experts** (trained and certified investigators)
40	(62)	- Visual field examination (Zeiss Humphrey Field Analyzer II 750i)	- Bilateral otoscopy - Pure tone air-conduction audiometry	- Mini Mental State Examination (MMSE)	1. **Modified scoring procedures** (The MMblind omits 8 visually presented items)
41	(55)	- Self-report	- Self-report	- Mini Mental State Examination (MMSE) - SIDAM - Global Deterrioration Scale - Blessed Dementia Rating Scale - Clinical Dementia Rating Scale	1. **Targeted team of experts** (research assistants, psychologists, geriatricians, or geriatric psychiatrists)
42	(132)	- Bailey-Lovie chart - Self-report	- Welch Allyn portable audiometer - Pure-tone auditory (PTA) threshold	- Mini Mental State Examination (MMSE) - Trail-making Test - Part B of the Halsted Reitan Battery - Verbal fluency test (VFT)	-
43	(56)	- Early Treatment of	- Audiometry (Madson 304	- Mini Mental State Examination (MMSE)	1. **Targeted team of experts** (research nurses)

		Diabetic Retinopathy Study (ETDRS)	portable audiometer)		
44	(133)	- Snellen's E chart	- Pure tone audiometry	- Mini Mental State Examination (MMSE)	-
45	(67)	- Self-report	- Self-report	- Telephone Interview for Cognitive Status (TICS) - Two cognitive subtests (word recall test, pentagon drawing test)	1. **Tests that do not include visual/audio items** (The TICS is administered over the phone and does not include visually presented items).
46	(134)	- Early Treatment of Diabetic Retinopathy Study (ETDRS)	- Pure-tone air and bone conduction audiometry	- Mini Mental State Examination (MMSE)	-
47	(135)	-Visual acuity measurement (Snellen and Parinaud charts) - Amsler grid	- Hearing Handicap Inventory for the Elderly Screening (HHIE-S)	- Mini Mental State Examination (MMSE)	-
48	(136)	- Self-report	- Self-report	- Blessed Orientation-Memory-Concentration test (BOMC)	-
49	(63)	- Medical records	- Medical records	- Montreal Cognitive Assessment-Blind (MoCA-blind) - Cognitive Performance Scale (CPS)	1. **Modified scoring procedures** (eliminating auditory and visual items from the MoCA)
50	(57)	Not reported	Not reported	- Four cognitive sub-tests (1. counting backwards from 100 for 30; 2. digit-span backwards subtest of the German version of the revised Wechsler Adult Intelligence scale (WAIS-R); 3. animal naming; 4. similarities subtest of the German WAIS-R)	1. **Targeted team of experts** (trained research assistant with psychology background) 2. **Communication strategies** (speak slowly, clearly, and loudly, ask for feedback during conversation, encourage participants to wear hearing aids if applicable and available) 3. **Environmental strategies** (testing took place in very quiet room)
51	(137)	- Resident Assessment Instrument-Home Care (RAI-HC)	- Resident Assessment Instrument-Home Care (RAI-HC)	- Cognitive Performance Scale (CPS)	-
52	(138)	- Visual acuity - Subjective refraction - Slit lamp examination - Intraocular pressure measurement - dilated fundus examination - Fundus photography	- Self-report	- Abbreviated Mental Test (AMT)	-
53	(58)	- InterRAI (Resident Assessment Instrument) Long-Term Care Facilities (LTCF)	- InterRAI (Resident Assessment Instrument) Long-Term Care Facilities (LTCF)	- Cognitive Performance Scale (CPS)	1. **Targeted team of experts** (study researchers)

54	(68)	- InterRAI (Resident Assessment Instrument) Long-Term Care Facilities (LTCF)	- InterRAI (Resident Assessment Instrument) Long-Term Care Facilities (LTCF)	- Cognitive Performance Scale (CPS)	1. **Data control** (statistics & analyses)
55	(59)	- InterRAI (Resident Assessment Instrument) Long-Term Care Facilities (LTCF)	- InterRAI (Resident Assessment Instrument) Long-Term Care Facilities (LTCF)	- Cognitive Performance Scale (CPS)	1. **Targeted team of experts** (study researchers, nursing home staff) 2. **Data control** (excluding residents with severe dementia from analyses)

Table 4: *Survey Response Proportions and Participant Characteristics*

Variable	***n***	**%***
Participants who completed the survey	87	100
Sex		
Male	3	3.45
Female	83	95.40
Prefer not to say	1	1.15
Gender		
Man	4	93.1
Woman	81	4.6
Something else (e.g., gender fluid, non-binary)	2	2.3
Age		
21-29	6	6.9
30-39	26	29.88
40-49	33	37.93
50-59	17	19.54
60+	5	5.75
Survey language		
English	31	35.63
French	56	64.37
Province		
Ontario	21	24.14
Quebec	66	75.86
Profession setting		
Public hospital	38	
Public clinic	8	
Private clinic	6	
Rehabilitation center	19	
Long-term care facility/ Nursing home	12	
Other	22	
Career length		
Between 0-5 years	7	8.05
Between 5-10 years	13	14.94
Between 10-20 years	32	36.78
Between 20+ years	35	40.23

**Value rounded to two decimal places.*

Table 5: *Frequency of reported cognitive measures used by OTs*

	n	**%***
Cognitive tool		
Montreal Cognitive Assessment (MoCA)	82	94.25
Mini-Mental State Examination (MMSE)	66	75.86
Self-report	24	27.59
Cognitive sub-tests	19	21.84
Cognitive Assessment Scale for the Elderly (CASE)	7	8.05
Rowland Universal Dementia Assessment Scale (RUDAS)	6	6.9
Informant Questionnaire on Cognitive Decline In The Elderly (IQCODE)	5	5.75
Standardized Mini-Cog Instrument (Mini-Cog)	4	4.6
Clinical Dementia Rating Scale (CDR)	1	1.15
Cognitive Performance Scale (CPS)	1	1.15
Telephone Interview for Cognitive Status (TICS)	1	1.15
Neurobehavioral Symptom Inventory (NSI)	1	1.15
Other (i.e., performance assessment of activities of daily living, caregiver questionnaires, functional evaluation, COGEVIS (COGnitive Evaluation in VISual impairment), etc.)	17	19.54

**Value rounded to two decimal places.*

Table 6: *Frequency of reported strategies during cognitive screening test with clients living with visual impairment.*

	n	**%***
Strategy		
I do not accommodate for vision impairments.	3	3.45
I use a version of the cognitive test that does not contain any visually presented items.	50	57.47
I modify the scoring procedures.	32	36.78
I screen/inquire about their visual function prior to test administration with a subjective assessment.	61	70.12
I screen/inquire about their visual function prior to test administration, with an objective assessment.	14	16.09
I strongly encourage the client to use their own visual aids, if applicable/available (glasses, contact lenses, magnifier, etc.).	83	95.4
I provide the client with assistive technology, if applicable/available (glasses, contact lenses, magnifier, closed-circuit device, larger print material, braille reading material, computer with braille, etc.).	40	45.98
I ensure that the printed material provided has high contrast.	41	47.13
I provide a large-print version of the visual test items.	47	54.02
I ensure that the lighting in the room is adequate for reading.	73	83.91
I ensure that the curtains on the window are closed to avoid glare on printed material.	29	33.33
I rephrase instructions to ensure comprehension.	49	56.32
I ask the client for feedback during the appointment.	45	51.72
I reschedule the appointment to allow for proper accommodation.	17	19.54
I ensure the presence of an intervenor.	3	3.45
I refer the client to a specialist.	14	16.09

**Value rounded to two decimal places.*

Table 7: *Frequency of reported strategies during cognitive screening test with clients who are hard-of-hearing (i.e., those who use spoken communication).*

	n	**%***
Strategy		
I do not accommodate for hearing impairments during the administration of cognitive screening tests in individuals who are hard of hearing.	0	0
I use a version of the cognitive test that is adapted to people with hearing impairment.	13	14.94
I modify the scoring procedures.	16	18.39
I screen/inquire about their hearing function prior to test administration with a subjective assessment.	68	78.16
I screen/inquire about their hearing function prior to test administration, with an objective assessment.	10	11.49
I strongly encourage the client to wear their own hearing aids, if applicable/available (hearing aid, cochlear implant, etc.).	85	97.7
I provide the client with assistive technology, if applicable/available (computer to communicate, volume control telephone, teleprinter, teletypewriter, telecommunications device for the deaf, amplifier, pocket-talker, etc.).	60	68.97
I ensure that the environment is as noiseless as possible by closing the door and reducing background noise.	84	96.55
I ensure face-to-face communication to promote lip-reading.	79	90.81
I ensure speaking at a slower, clearer pace with an appropriate tone.	83	95.4
I rephrase instructions to ensure comprehension.	69	79.31
I ask the client for feedback during the appointment.	50	57.47
I reschedule the appointment to allow for proper accommodation.	15	17.24
I ensure the presence of an intervenor.	3	3.45
I refer the client to a specialist.	11	12.64

**Value rounded to two decimal places.*

Table 8: *Frequency of reported strategies during cognitive screening test with clients who are D/deaf (i.e., those who use sign language).*

	n	**%***
Strategy		
I do not accommodate for hearing impairments during the administration of cognitive screening tests in individuals who are deaf.	5	5.75
I use a version of the cognitive test that is adapted to people with hearing impairment.	15	17.24
I modify the scoring procedures.	14	16.09
I screen/inquire about their hearing function prior to test administration with a subjective assessment.	27	31.03
I screen/inquire about their hearing function prior to test administration, with an objective assessment.	5	5.75
I strongly encourage the client to wear their own hearing aids, if applicable/available (hearing aid, cochlear implant, etc.).	33	37.93
I provide the client with assistive technology, if applicable/available (computer to communicate, volume control telephone, teleprinter, teletypewriter, telecommunications device for the deaf, amplifier, pocket-talker, etc.).	25	28.74
I ensure that the environment is as noiseless as possible by closing the door and reducing background noise.	22	25.29
I ensure face-to-face communication to promote lip-reading.	40	45.98
I ensure speaking at a slower, clearer pace with an appropriate tone.	31	35.63
I rephrase instructions to ensure comprehension.	24	27.59
I ask the client for feedback during the appointment.	18	20.69
I reschedule the appointment to allow for proper accommodation.	9	10.35
I ensure the presence of an intervenor.	29	33.33
I refer the client to a specialist.	17	19.54

**Value rounded to two decimal places.*

Table 9: *Frequency of reported strategies during cognitive screening test with clients who live with dual sensory impairment.*

	n	**%***
Strategy		
I do not accommodate for dual sensory impairment.	9	10.35
I screen/inquire about their hearing and visual function prior to test administration with a subjective assessment.	54	62.07
I screen/inquire about their hearing and visual function prior to test administration with an objective assessment.	12	13.79
I strongly encourage the client to wear their own hearing and/or use their visual aids, if applicable/available.	62	71.26
I provide the client with assistive technology, if applicable/available.	41	47.13
I use a tactile test.	3	3.45
I use sign language.	3	3.45
I use fingerspelling.	1	1.15
I require an assistant.	28	32.18
I communicate using social haptics.	2	2.3
I use Tadoma communication.	0	0
I use braille reading material.	0	0
I ask the client for feedback during the appointment.	24	27.59
I reschedule the appointment to allow for proper accommodation.	16	18.39
I ensure the presence of an intervenor.	27	31.03
I refer the client to a specialist.	28	32.18

**Value rounded to two decimal places.*

Table 10: *Frequency distribution of the number of participants that reported a given number of strategies as a function of their self-rated competence with clients who are hard-of-hearing.*

	Reported number of strategies used											
Self-rated competence	**0**	**1**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Total**
1 – Extremely unsatisfied	1	0	0	0	2	0	0	1	0	0	0	**4**
2 - Unsatisfied	0	1	0	1	3	7	1	2	0	1	0	**16**
3 – Neither satisfied nor unsatisfied	0	0	2	2	7	11	7	7	3	1	0	**20**
4 - Satisfied	0	0	0	0	5	9	1	6	4	1	1	**27**
5 - Extremely satisfied	0	0	0	0	0	0	0	0	0	0	0	**0**
Total	**1**	**1**	**2**	**3**	**17**	**27**	**9**	**16**	**7**	**3**	**1**	**87**

Table 11: *Frequency distribution of the number of participants that reported a given number of strategies as a function of their self-rated competence with clients living with dual sensory impairment.*

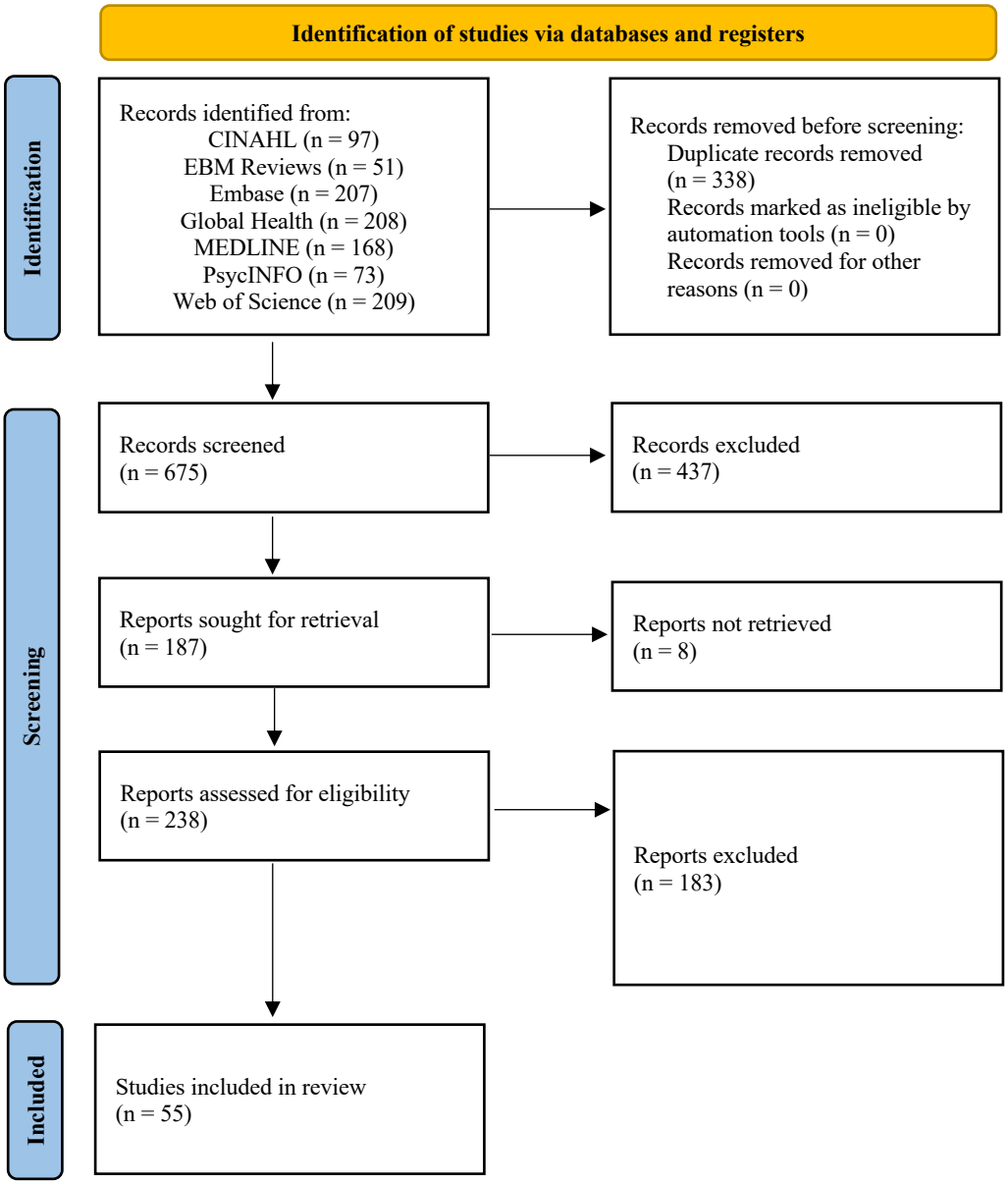
	Reported number of strategies used										
Self-rated competence	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Total**
1 – Extremely unsatisfied	3	5	1	5	3	1	0	0	1	0	**19**
2 - Unsatisfied	0	7	3	5	7	2	2	2	0	1	**29**
3 – Neither satisfied nor unsatisfied	2	4	1	7	3	8	3	1	2	0	**31**
4 - Satisfied	0	0	0	2	0	3	0	3	0	0	**8**
5- Extremely satisfied	0	0	0	0	0	0	0	0	0	0	**0**
Total	**5**	**16**	**5**	**19**	**13**	**14**	**5**	**6**	**3**	**1**	**87**

Table 12: *Frequency of selected topics of interest for future learning on cognitive screening tests in individuals with sensory impairment*

	Technological strategies	Environmental strategies	Communication strategies	Alternative strategies	Test adaptations for existing cognitive screening/assessment	The association between the sensory group and cognition	I feel like I have enough knowledge on this topic
Sensory status							
Visual impairment (n = 3)*	1	1	1	2	3	1	0
Hearing impairment (n = 5)*	4	4	4	4	5	3	0
Dual sensory impairment (n = 87)**	71	61	77	68	75	57	1

*Only clinicians who indicated not accommodating for VI or HI were asked about the accommodations for these sensory impairments they would you like to learn about to enhance cognitive test administration.
** All participating clinicians were asked about the accommodations for DSI they would you like to learn about to enhance cognitive test administration.

Figure 1: *PRISMA Flow Diagram*



Supplementary material 1: *Clinical practice survey in English*

Screening cognition in persons living with sensory impairment: Current practice

You are invited to participate in a research study on the accommodations and adaptations you might use when administering cognitive screening tests to individuals with hearing and/or visual impairments. This survey will only take you about 5 minutes. Thank you for your participation in this study.

Statements to confirm eligibility that will appear before the consent form.

I am a healthcare professional.

- ☐ Yes
- ☐ No

I deliver services to individuals with hearing and/or visual impairment.

- ☐ Yes
- ☐ No

If "no" and "no", they will be taken to a thank you page. If "yes" and "no", they will be taken to a thank you page.
If "yes" and "yes" they will be taken to the consent form. If they agree to the terms and conditions listed in the consent form, they will be then taken to the survey. If they do not agreethey will be taken to a thank you page.

The following questions explore aspects of your clinical practice when you may bescreening your clients or patients for the presence of cognitive difficulties.

Do you use cognitive screening test(s) routinely in your practice?

- ☐ Yes
- ☐ No

If "yes", they will pursue the survey.
If "no", they will be taken to a thank you page.

Which cognitive screening test(s) do you routinely use in your practice? Please select all that apply.

- ☐ Mini-Mental State Examination (MMSE)
- ☐ Montreal Cognitive Assessment (MoCA)
- ☐ National Institute of Neurological and Communicative Disorders and Strokeand the Alzheimer's Disease and Related Disorders Association (NINCDS-ADRDA Alzheimer's Criteria)
- ☐ Clinical Dementia Rating Scale (CDR)
- ☐ IQCODE
- ☐ Cognitive Performance Scale (CPS)
- ☐ ICD-9 Dementia Diagnosis
- ☐ Telephone Interview for Cognitive Status (TICS)
- ☐ The Alzheimer's Disease Assessment Scale–Cognitive Subscale (ADAS-Cog)
- ☐ Neurobehavioral Symptom Inventory (NSI)

- General Practitioner assessment of Cognition (GPCOG)
- Standardized Mini-Cog Instrument (Mini-Cog)
- Cambridge Cognitive Examination (CAMCOG)
- Cognitive sub-tests
- Self-report
- Other:

Please rate your overall satisfaction of your own ability to deliver services to individuals with visual impairment (1= Extremely unsatisfied, 5=Extremely satisfied).

- 1
- 2
- 3
- 4
- 5

How do you accommodate for vision impairments during the administration of cognitive screening tests? Please select all that apply.

- I do not accommodate for vision impairments.
- I use a version of the cognitive test that does not contain any visually presented items.
- I modify the scoring procedures.
- I screen/inquire about their visual function prior to test administration with a subjective assessment.
- I screen/inquire about their visual function prior to test administration, with an objective assessment.
- I strongly encourage the patient to use their own visual aids, if applicable/available (glasses,contact lenses, magnifier, etc.).
- I provide the patient with assistive technology, if applicable/available (glasses, contact lenses,magnifier, closed-circuit device, larger print material, braille reading material, computer with braille, etc.).
- I ensure that the printed material provided has high contrast.
- I provide a large-print version of the visual test items.
- I ensure that the lighting in the room is adequate for reading.
- I ensure that the curtains on the window are closed to avoid glare on printed material.
- I rephrase instructions to ensure comprehension.
- I ask the patient for feedback during the appointment.
- I reschedule the appointment to allow for proper accommodation.
- Other:

If clinician selects "I do not accommodate for vision impairments." in the previous question,then ask:

What accommodations for vision impairments would you like to learn about to enhance cognitive test administration? Please select all that apply.

- Technological strategies
- Environmental strategies
- Communication strategies
- Alternative strategies
- Test adaptations for existing cognitive screening/assessment tools
- The association between visual impairment and cognition

- I feel like I have enough knowledge on this topic
- Other:

Please rate your overall satisfaction of your own ability to deliver services to individuals with hearing impairment (1= Extremely unsatisfied, 5=Extremely satisfied).

- 1
- 2
- 3
- 4
- 5

How do you accommodate for hearing impairment during the administration of cognitive screening tests in individuals who are hard of hearing (i.e., those who use spoken communication)? Please select all that apply.

- I do not accommodate for hearing impairments during the administration of cognitive screening tests in individuals who are hard of hearing.
- I use a version of the cognitive test that is adapted to people with hearing impairment.
- I modify the scoring procedures.
- I screen/inquire about their hearing function prior to test administration with a subjective assessment.
- I screen/inquire about their hearing function prior to test administration, with an objective assessment.
- I strongly encourage the patient to wear their own hearing aids, if applicable/available (hearing aid, cochlear implant, etc.).
- I provide the patient with assistive technology, if applicable/available (computer to communicate, volume control telephone, teleprinter, teletypewriter, telecommunications devicefor the deaf, amplifier, pocket-talker, etc.)
- I ensure that the environment is as noiseless as possible by closing the door and reducing background noise.
- I ensure face-to-face communication to promote lip-reading.
- I ensure speaking at a slower, clearer pace with an appropriate tone.
- I rephrase instructions to ensure comprehension.
- I ask the patient for feedback during the appointment.
- I reschedule the appointment to allow for proper accommodation.
- Other:

How do you accommodate for hearing impairment during the administration of cognitive screening tests in individuals who are deaf (i.e., those who use sign language)? Please select all that apply.

- I do not accommodate for hearing impairments during the administration of cognitive screening tests in individuals who are deaf.
- I use a version of the cognitive test that is adapted to people with hearing impairment.
- I modify the scoring procedures.
- I screen/inquire about their hearing function prior to test administration with a subjective assessment.
- I screen/inquire about their hearing function prior to test administration, with an objective assessment.
- I strongly encourage the patient to wear their own hearing aids, if applicable/available

(hearing aid, cochlear implant, etc.).
- I provide the patient with assistive technology, if applicable/available (computer to communicate, volume control telephone, teleprinter, teletypewriter, telecommunications devicefor the deaf, amplifier, pocket-talker, etc.)
- I ensure that the environment is as noiseless as possible by closing the door and reducing background noise.
- I ensure face-to-face communication to promote lip-reading.
- I ensure speaking at a slower, clearer pace with an appropriate tone.
- I rephrase instructions to ensure comprehension.
- I ask the patient for feedback during the appointment.
- I reschedule the appointment to allow for proper accommodation.
- Other:

If clinician selects "I do not accommodate for hearing impairments during the administration of cognitive screening tests in individuals who are hard of hearing" and/or "I do not accommodate for hearing impairments during the administration of cognitive screening tests in individuals who are deaf" in the previous questions, then ask:

What accommodations for hearing impairments would you like to learn about to enhance cognitive test administration? Please select all that apply.
- Technological strategies
- Environmental strategies
- Communication strategies
- Alternative strategies
- Test adaptations for existing cognitive screening/assessment tools
- The association between hearing impairment and cognition
- I feel like I have enough knowledge on this topic
- Other:

Please rate your overall satisfaction of your own ability to deliver services to individuals with both hearing and visual impairment (1= Extremely unsatisfied, 5=Extremely satisfied).
- 1
- 2
- 3
- 4
- 5

How do you accommodate for dual sensory impairment (concurrent hearing and visual impairment) during the administration of cognitive screening tests? Please select all that apply.
- I do not accommodate for dual sensory impairment.
- I screen/inquire about their hearing and visual function prior to test administration with a subjective assessment.
- I screen/inquire about their hearing and visual function prior to test administration with an objective assessment.
- I strongly encourage the patient to wear their own hearing and/or use their visual aids, if applicable/available.
- I provide the patient with assistive technology, if applicable/available.

- ☐ I use a tactile test.
- ☐ I use sign language.
- ☐ I use fingerspelling
- ☐ I require an assistant.
- ☐ I communicate using social haptics.
- ☐ I use Tadoma communication.
- ☐ I use braille reading material.
- ☐ I ask the patient for feedback during the appointment.
- ☐ I reschedule the appointment to allow for proper accommodation.
- ☐ I ensure the presence of an intervenor.
- ☐ I refer the client to a specialist.
- ☐ Other:

What accommodations for dual sensory impairment would you like to learn about to enhance cognitive test administration? Please select all that apply.

- ☐ Technological strategies
- ☐ Environmental strategies
- ☐ Communication strategies
- ☐ Alternative strategies
- ☐ Test adaptations for existing cognitive screening/assessment
- ☐ The association between dual sensory impairment and cognition
- ☐ I feel like I have enough knowledge on this topic.
- ☐ Other:

The following questions are about your personal and professional background.

What is your current age in years?

What sex were you assigned at birth, meaning on your original birth certificate?

- ☐ Male
- ☐ Female
- ☐ Intersex
- ☐ Prefer not to say

Which best describes your current gender identity?

- ☐ Male
- ☐ Female
- ☐ Indigenous gender minority identity (e.g., Two-Spirit) or other cultural gender minority identity
- ☐ Something else (e.g., gender fluid, non-binary)
- ☐ Prefer not to say

In what province do you currently practice in?

- ☐ Ontario
- ☐ Quebec
- ☐ Nova Scotia
- ☐ New Brunswick
- ☐ Manitoba

- British Columbia
- Prince Edward Island
- Saskatchewan
- Alberta
- Newfoundland and Labrador
- Canadian territories

What is your profession?

- Medical doctor/General practitioner
- Occupational therapist
- Nurse
- Psychologist/Neuropsychologist/Neuropsychiatrist
- Other, please specify

What is your professional specialization?

How long have you been practicing?

- 0-5 years
- 5-10 years
- 10-20 years
- 20+ years

In what institution are you practicing?

- Public hospital
- Private hospital
- Public clinic
- Private clinic
- Rehabilitation centre
- Long-term care facility
- Nursing home

If you have any comments or suggestions regarding this survey, please share them below (optional).

Supplementary material 2: *Clinical practice survey in French*

Dépistage de la cognition chez les personnes vivant avec une déficience sensorielle: Pratique actuelle

Vous êtes invité(e) à participer à un projet de recherche portant sur les adaptations et les accommodations que vous pourriez utiliser lors de l'administration de tests de dépistage cognitif auprès de personnes atteintes de déficience auditive et/ou visuelle. Ce sondage ne vous prendra qu'environ 5minutes. Nous vous remercions de votre participation à cette étude.

Déclarations pour confirmer l'éligibilité qui apparaîtront avant le formulaire de consentement.

Je suis un(e) professionnel(le) de la santé.

- ☐ Oui
- ☐ Non

Je fournis des services aux personnes ayant une déficience auditive et/ou visuelle.

- ☐ Oui
- ☐ Non

Si "non" et "non", ils seront dirigés vers une page de remerciement.
Si "oui" et "non", ils seront dirigés vers une page de remerciement.
Si "oui" et "oui", ils seront dirigés vers le formulaire de consentement. S'ils acceptent les termes et conditions énumérés dans le formulaire de consentement, ils seront ensuite dirigés vers l'enquête. S'ils ne sont pas d'accord, ils seront dirigés vers une page de remerciement.

Les questions suivantes explorent les aspects de votre pratique clinique lorsque vous êtes amené à dépister la présence de troubles cognitifs chez vos clients ou patients.

Utilisez-vous un/des test(s) de dépistage cognitif dans votre pratique?

- ☐ Oui
- ☐ Non

Si "oui", ils poursuivront l'enquête.
Si "non", ils seront dirigés vers une page de remerciement.

Quel(s) test(s) de dépistage cognitif utilisez-vous systématiquement dans votre pratique ? Veuillez sélectionner tous ceux qui s'appliquent.

- ☐ Mini-Mental State Examination (MMSE)
- ☐ Montreal Cognitive Assessment (MoCA)
- ☐ National Institute of Neurological and Communicative Disorders and Strokeand the Alzheimer's Disease and Related Disorders Association (NINCDS-ADRDA Alzheimer's Criteria)
- ☐ Clinical Dementia Rating Scale (CDR)
- ☐ IQCODE
- ☐ Cognitive Performance Scale (CPS)
- ☐ ICD-9 Dementia Diagnosis
- ☐ Telephone Interview for Cognitive Status (TICS)

- The Alzheimer's Disease Assessment Scale–Cognitive Subscale (ADAS-Cog)
- Neurobehavioral Symptom Inventory (NSI)
- General Practitioner assessment of Cognition (GPCOG)
- Standardized Mini-Cog Instrument (Mini-Cog)
- Cambridge Cognitive Examination (CAMCOG)
- Sous-tests cognitifs
- Auto-évaluation
- Autre:

Veuillez évaluer votre satisfaction générale quant à votre propre capacité à fournir des services aux personnes atteintes de déficience visuelle (1=Extrêmement insatisfait(e), 5=Extrêmement satisfait(e)).

- 1
- 2
- 3
- 4
- 5

Comment tenez-vous compte des <u>déficiences visuelles</u> pendant l'administration des tests de dépistage cognitif? Veuillez sélectionner toutes les réponses qui s'appliquent.

- Je ne tiens pas compte des déficiences visuelles.
- J'utilise une version du test cognitif qui ne contient pas d'éléments présentés visuellement.
- Je modifie les procédures de notation.
- J'effectue un dépistage/une enquête sur leur fonction visuelle avant l'administration du test, par une évaluation subjective.
- J'effectue un dépistage/une enquête sur leur fonction visuelle avant l'administration du test, par une évaluation objective.
- J'encourage fortement le client d'utiliser ses propres aides visuelles, si elles sont applicables/disponibles (lunettes, lentilles de contact, loupe, etc.).
- Je fournis au client une technologie d'assistance, si elle est applicable/disponible (lunettes, lentilles de contact, loupe, dispositif en circuit fermé, matériel imprimé plus grand, matériel de lecture en braille, ordinateur avec braille, etc.).
- Je m'assure que le matériel imprimé fourni présente un contraste élevé.
- Je fournis une version en gros caractères des éléments du test visuel.
- Je m'assure que l'éclairage de la pièce est adéquat pour la lecture.
- Je m'assure que les rideaux de la fenêtre sont fermés pour éviter l'éblouissement du matériel imprimé.
- Je reformule les instructions pour m'assurer de leur compréhension.
- Je demande au client de me faire part de ses commentaires pendant le rendez-vous.
- Je reprogramme le rendez-vous pour permettre une adaptation adéquate.
- Je m'assure de la présence d'un intervenant.
- Je réfère le client à un spécialiste.
- Autre::

Si le clinicien/la clinicienne choisit " Je ne tiens pas compte des déficiences visuelles." à la question précédente, demander:

Quelles accommodations pour les déficiences visuelles aimeriez-vous connaître pour améliorer l'administration des tests cognitifs ? Veuillez sélectionner toutes les réponses qui s'appliquent.

- Stratégies technologiques
- Stratégies environnementales
- Stratégies de communication
- Stratégies alternatives
- Adaptation des tests existants pour les dépistages/évaluations cognitifs
- L'association entre la déficience visuelle et la cognition
- J'ai le sentiment d'avoir suffisamment de connaissances sur ce sujet
- Autre:

Veuillez évaluer votre satisfaction générale quant à votre propre capacité à fournir des services aux personnes ayant une déficience auditive (1=Extrêmement insatisfait(e), 5=Extrêmement satisfait(e)).

- 1
- 2
- 3
- 4
- 5

Comment tenez-vous compte des <u>déficiences auditives</u> pendant l'administration des tests de dépistage cognitif chez les <u>personnes malentendantes</u> (c'est-à-dire celles qui utilisent la communication orale)? Veuillez choisir toutes les réponses qui s'appliquent.

- Je ne tiens pas compte des déficiences auditives pendant l'administration des tests de dépistage cognitif chez les personnes malentendantes.
- J'utilise une version du test cognitif adaptée aux personnes ayant une déficience auditive.
- Je modifie les procédures de notation.
- J'effectue un dépistage/une enquête sur leur fonction auditive avant l'administration du test avec une évaluation subjective.
- J'effectue un dépistage/une enquête sur leur fonction auditive avant l'administration du test, avec une évaluation objective.
- J'encourage fortement le client à porter ses propres appareils auditifs, s'ils sont applicables/disponibles (prothèse auditive, implant cochléaire, etc.).
- Je fournis au client une technologie d'assistance, s'il y a lieu/disponible (ordinateur pour communiquer, téléphone à volume contrôlé, téléimprimeur, appareil de télécommunication pour les sourds, amplificateur, appareil de poche pour parler, etc.).
- Je m'assure que l'environnement est aussi silencieux que possible en fermant la porte et en réduisant le bruit de fond.
- J'assure une communication en face à face pour favoriser la lecture labiale.
- Je veille à parler à un rythme plus lent et plus clair avec un ton approprié.
- Je reformule les instructions pour en assurer la compréhension.

- Je demande au client de me faire part de ses commentaires pendant le rendez-vous.
- Je reprogramme le rendez-vous pour permettre une adaptation adéquate.
- Je m'assure de la présence d'un intervenant.
- Je réfère le client à un spécialiste.
- Autre:

Comment tenez-vous compte des <u>déficiences auditives</u> pendant l'administration des tests de dépistage cognitif <u>chez les personnes sourdes</u> (c'est-à-dire celles qui utilisent le langage des signes)? Veuillez choisir toutes les réponses qui s'appliquent.

- Je ne tiens pas compte des déficiences auditives pendant l'administration des tests de dépistage cognitif chez les personnes sourdes.
- J'utilise une version du test cognitif adaptée aux personnes ayant une déficience auditive.
- Je modifie les procédures de notation.
- J'effectue un dépistage/une enquête sur leur fonction auditive avant l'administration du test avec une évaluation subjective.
- J'effectue un dépistage/une enquête sur leur fonction auditive avant l'administration du test, avec une évaluation objective.
- J'encourage fortement le client à porter ses propres appareils auditifs, s'ils sont applicables/disponibles (prothèse auditive, implant cochléaire, etc.).
- Je fournis au client une technologie d'assistance, s'il y a lieu/disponible (ordinateur pour communiquer, téléphone à volume contrôlé, téléimprimeur, appareil de télécommunication pour les sourds, amplificateur, appareil de poche pour parler, etc.).
- Je m'assure que l'environnement est aussi silencieux que possible en fermant la porte et en réduisant le bruit de fond.
- J'assure une communication en face à face pour favoriser la lecture labiale.
- Je veille à parler à un rythme plus lent et plus clair avec un ton approprié.
- Je reformule les instructions pour en assurer la compréhension.
- Je demande au client de me faire part de ses commentaires pendant le rendez-vous.
- Je reprogramme le rendez-vous pour permettre une adaptation adéquate.
- Je m'assure de la présence d'un intervenant.
- Je réfère le client à un spécialiste.
- Autre::

Si le clinicien/la clinicienne sélectionne : « Je ne tiens pas compte des déficiences auditives pendant l'administration des tests de dépistage cognitif chez les personnes malentendantes » ou « Je ne tiens pas compte des déficiences auditives pendant l'administration des tests de dépistage cognitif chez les personnes sourdes. » dans les questions précédentes, demander :

Quelles accommodations pour les déficiences auditives aimeriez-vous apprendre pour améliorer l'administration des tests cognitifs?

- Stratégies technologiques
- Stratégies environnementales
- Stratégies de communication
- Stratégies alternatives
- Adaptation des tests existants pour les dépistages/évaluations cognitifs

- L'association entre la déficience auditive et la cognition
- J'ai le sentiment d'avoir suffisamment de connaissances sur ce sujet
- Autre: :

Veuillez évaluer votre satisfaction générale quant à votre propre capacité à fournir des services aux personnes atteintes de déficience auditive et visuelle simultanée (1= Extrêmement insatisfait(e), 5=Extrêmement satisfait(e)).

- 1
- 2
- 3
- 4
- 5

Comment tenez-vous compte de la <u>double déficience sensorielle</u> (déficience auditive et visuelle simultanée) pendant l'administration de tests de dépistage cognitif? Veuillez choisir toutes les réponses qui s'appliquent.

- Je ne fais pas d'adaptation pour la double déficience sensorielle.
- J'effectue un dépistage/une enquête sur leur fonction auditive et visuelle avant l'administration du test avec une évaluation subjective.
- J'effectue un dépistage/une enquête sur leur fonction auditive et visuelle avant l'administration du test avec une évaluation objective.
- J'encourage fortement le client à porter ses propres aides auditives et visuelles, si elles sont applicables/disponibles.
- Je fournis au client une technologie d'assistance, si elle est applicable/disponible.
- J'utilise un test tactile.
- J'utilise le langage des signes.
- J'utilise l'épellation digitale.
- J'ai besoin d'un assistant.
- Je communique en utilisant l'haptique sociale.
- J'utilise la communication Tadoma.
- J'utilise du matériel de lecture en braille.
- Je demande au client de me faire part de ses commentaires pendant le rendez-vous.
- Je reprogramme le rendez-vous pour permettre une adaptation adéquate.
- Je m'assure de la présence d'un intervenant.
- Je réfère le client à un spécialiste.
- Autre: :

Quelles accommodations pour la double déficience sensorielle (déficience auditive et visuelle) aimeriez-vous apprendre pour améliorer l'administration des tests cognitifs? Veuillez choisir toutes les réponses qui s'appliquent.

- Stratégies technologiques
- Stratégies environnementales
- Stratégies de communication
- Stratégies alternatives
- Adaptation des tests existants pour les dépistages/évaluations cognitifs

- L'association entre la double déficience sensorielle et la cognition
- J'ai le sentiment d'avoir suffisamment de connaissances sur ce sujet

Les questions suivantes portent sur votre parcours personnel et professionnel.

Quel est votre âge actuel en années ?

Quel sexe vous a-t-on assigné à la naissance, c'est-à-dire sur votre certificat de naissance original ?

- Homme
- Féminin
- Intersexe
- Préfère ne pas répondre
- Autre: :

Laquelle décrit le mieux votre identité de genre actuelle ?

- Homme
- Femme
- Identité de minorité de genre autochtone (p. ex. bispirituel) ou Autre: identité de minorité degenre culturelle
- Autre: (p. ex., genre fluide, non-binaire)
- Préfère ne pas répondre

Dans quelle province exercez-vous actuellement ?

- Ontario
- Québec
- Nouvelle-Écosse
- Nouveau-Brunswick
- Manitoba
- Colombie-Britannique
- Île-du-Prince-Édouard
- Saskatchewan
- Alberta
- Terre-Neuve et Labrador
- Territoires canadiens
- Autre: :

Quelle est votre profession ?

- Médecin/généraliste
- Ergothérapeute
- Infirmier(e)
- Psychologue/Neuropsychologue/Neuropsychiatre
- Autre: :

Quelle est votre spécialisation professionnelle ?

Depuis combien de temps pratiquez-vous ?

- 0-5 ans
- 5 à 10 ans
- 10-20 ans
- Plus de 20 ans

Dans quel établissement pratiquez-vous ?

- Hôpital public
- Hôpital privé
- Clinique publique
- Clinique privée
- Centre de réadaptation
- Maison de soins de longue durée
- Maison de retraite
- Autre: :

Si vous avez des commentaires ou des suggestions concernant cette étude, veuillez les partager ci-dessous (optionnel).