Alzheimer's & Dementia: Translational Research & Clinical Interventions 5 (2019) 501-507

Alzheimer's & Dementia

Featured Article

The case-finding study: A novel community-based research recruitment approach for engaging participants with early cognitive decline

Joseph B. Dubé[a], Tianzheng Lin[a], Sarah Best[a], Julia Truemner[a], Patricia Sargeant[b], Michael J. Borrie[a,b,*]

[a]*Parkwood Institute Research, Lawson Health Research Institute, London, ON, Canada*
[b]*Department of Medicine, Schulich School of Medicine and Dentistry, Western University, Victoria Hospital, London, ON, Canada*

Abstract

Introduction: Innovative recruitment strategies are needed to better engage potential research participants at a preclinical stage of cognitive decline.
Methods: Local newspaper advertisements attracted community-dwelling people ≥55 years with memory concerns, who were interested in research, to self-refer for cognitive assessment and discuss cognitive research involvement. Respondents completed telephone screening and then attended an in-person cognitive screening assessment with a study partner. Case conferencing with a clinician researcher characterized a "clinical suspicion" of the participant's cognitive concern.
Results: Of 209 respondents who underwent in-person assessment, 203 participants were classified as having subjective cognitive decline (47%), mild cognitive impairment (44%), or dementia (9%). Thirty percent of participants were enrolled in observational studies or randomized controlled trials.
Discussion: Community-based engagement, cognitive screening, and case conferencing effectively combined to identify research participants at risk of cognitive decline and recruited participants into cognitive research studies. Those not recruited continued to be followed up longitudinally.

Keywords: Recruitment; Screening; Clinical trials; Community-based; Self-referral; Subjective cognitive decline; Mild cognitive impairment; Alzheimer's disease; Dementia

1. Introduction

Alzheimer's disease (AD) remains the leading cause of dementia for which effective treatments are urgently being researched [1]. Cognitive decline leading to AD is believed to follow a gradual and insidious course, where distinct stages of cognitive impairment have been conceptualized [2]. Subjective cognitive decline (SCD) represents the earliest stage at risk for cognitive decline and refers to an individual's persistent concern about their change in cognition without any objective evidence of cognitive decline [3]. Mild cognitive impairment (MCI) is believed to follow SCD on the spectrum of cognitive decline and refers to an objective decline in cognitive performance without any impact on instrumental daily activities [4–6]. Together, the engagement of individuals with suspected SCD and MCI may be crucial for clinically monitoring patients at risk of cognitive impairment as well as for research initiatives aimed at understanding the progression of AD and investigating new treatment interventions earlier in the disease course.

Participant recruitment represents a consistent barrier to the timely completion of many cognitive research studies. As a consequence, various recruitment strategies have been implemented. Strategies include internet-based recruitment or geographically focused mailing campaigns that cast a wide net to populate large-scale registries [7]. These approaches have open inclusion criteria but low cognitive research study enrollment rates, and low general practitioner interest in cognitive research promotion. Another approach

*Corresponding author. Tel.: 1-519-685-4021.
E-mail address: Michael.borrie@sjhc.london.on.ca

https://doi.org/10.1016/j.trci.2019.07.009

to cognitive research recruitment implemented extensive community-based engagement and the establishment of a centralized "Recruitment Operations" program which led to improved study enrollment for prescreened participants and reduced the median time from initial contact to study enrollment [8]; however, additional improvements are needed.

We report the methodology and implementation of the case-finding study, a novel cognitive research study recruitment strategy that used self-referral from a local older community-dwelling population with persistent cognitive concerns as a means to engage potential participants at early stages on the spectrum of cognitive decline. The case-finding study uniquely emphasized more selective participant recruitment, case conferencing to review participant data, and longitudinal follow-up with communication of our findings with each participant's family physician. Our approach to cognitive research recruitment offers additional strategies for identifying and retaining potential candidates for cognitive studies.

2. Methods

2.1. Study design and recruitment

Our study was approved by the Western Research Ethics Board under the project title "Case Finding of People with Mild Cognitive Impairment (MCI) Who Are Interested in Participating in MCI Research Studies." We refer to this project here as the case-finding study. The case-finding study design is summarized in Fig. 1. We used print advertising in local newspapers. Inclusion criteria specified any community-dwelling person $\geq$55 years old with persistent memory concerns and an interest in cognitive research participation. "Case Finding" candidates were excluded based on a history of a non-AD condition that could explain cognitive decline such as stroke or an unmanaged mood disorder. Respondents contacted our research group to complete a telephone screening survey and potential participants were invited to an in-person interview and cognitive assessment with a research coordinator.

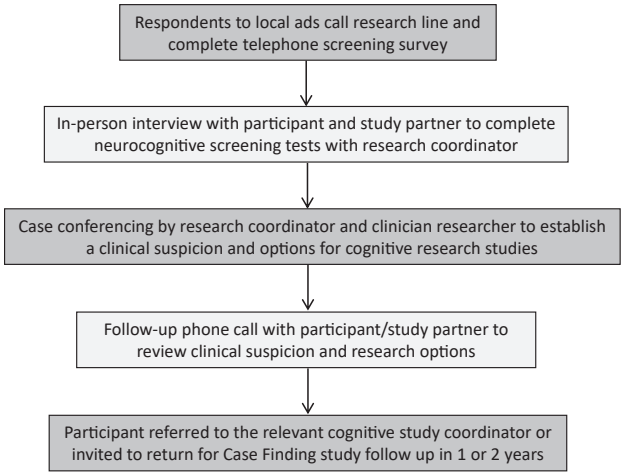

Fig. 1. Case-finding study methodology flow chart.

2.2. Cognitive assessment and clinical suspicion

Informed consent from the participant and their study partner was followed by focused history-taking with the participant about their cognitive concern. Case-finding participants were assessed through an in-person interview using screening neurocognitive tests with a research coordinator and a collateral interview with their study partner. Past medical and surgical history, currently prescribed medications, risk factors, and relevant social history were recorded. The study partner was interviewed separately and provided collateral history on any subtle or more obvious changes they had noted in the participant's cognitive abilities.

Case-finding participants were assessed using the Standardized Mini–Mental Status Examination incorporating both the spelling of "world" backward and serial seven subtraction [9,10], and the Montreal Cognitive Assessment (MoCA) from which we calculated the memory index subscore [11,12]. Mini–Mental Status Examination and MoCA cutoff scores for normal cognition were 27/30 and 26/30, respectively. Study partners' insight provided collateral assessment using the AD8 and the Lawton-Brody Activities of Daily Living survey to capture the participant's independence in the instrumental activities of daily living (IADLs) and basic activities of daily living (ADLs) [13,14].

Each participant's mood was assessed using the Geriatric Depression Scale administered with the participant, and the Cornell Scale for Depression in Dementia which was completed with the study partner [15,16].

After the participant's interview and assessment, case conferencing occurred with the research coordinator and a clinician researcher (M.J.B.) to formulate a clinical suspicion to characterize the participant's cognitive concern. We provided a "clinical suspicion", as opposed to a "clinical impression", as the participant was not assessed in person by the clinician researcher. This process involved reviewing the participant's focused history, memory and mood testing, and collateral information provided by the study partner. Participants were categorized into one of three groups based on clinical suspicion of their cognitive concern. Participants suspected of having SCD had persistent cognitive concerns but demonstrated cognitive testing scores at or above the normal cutoff score as well as intact IADLs and ADLs. Participants suspected of having MCI had a history of persistent and progressive cognitive decline, a cognitive testing score below the normal MoCA cutoff score, and intact IADLs and ADLs. Finally, participants suspected of having dementia had a history of cognitive decline, a cognitive testing score below the normal cutoff score, and significant impairment in IADLs or ADLs presumed to be due to a progressive neurocognitive disorder.

2.3. Letter to the family physician

After case conferencing, we communicated with participants by phone to convey our clinical suspicion with options to consider for further research involvement. With each participant's consent, we provided a one-page letter signed by the clinician researcher to the participant's family physician along with copies of the completed cognitive tests. This summarized the participant's cognitive risk factors, cognitive test scores, as well as our clinical suspicion of their cognitive concern. Family physicians were encouraged to contact our group with any questions or concerns regarding our findings.

2.4. Statistical analyses

Statistical analyses were performed in SPSS, version 23. Participant demographics were compared using t-tests, Wilcoxon tests, or Fisher Exact tests where appropriate with statistical significance defined as a P value $\leq .05$.

3. Results

3.1. Participant recruitment and demographics

A total of 209 respondents were screened between 2009 and 2018. Two hundred three respondents were enrolled and attended in-person interviews followed by case conferencing with a clinician researcher (Fig. 2). Baseline demographics for the 203 participants are presented in Table 1. Female participants comprised most enrolled participants (66%) and differed significantly from male participants on median age and the proportions that lived alone, regularly consumed alcohol or smoked cigarettes, and expressed depressive symptoms.

Table 1
Case-finding study participant baseline demographics

Demographic categories	Female	Male	P value
Social demographics			
Number (%)	134 (66)	69 (34)	-
Age (years)	68 ± 8	71 ± 8*	.011
Secondary education (%)	117/122 (96)	65/68 (96)	ns
Reported to family doctor (%)	69/127 (54)	42/67 (63)	ns
Lives alone (%)	36/111 (32)	6/58 (10)*	.001
Risk factors			
Regular alcohol consumption (%)	85/124 (69)	57/67 (85)*	.015
Smoking history (%)	53/130 (41)	41/69 (59)*	.017
Heart disease (%)	13/112 (12)	23/69 (33)	ns
Cerebrovascular accident (%)	3/130 (2)	1/69 (1)	ns
Type 2 diabetes (%)	8/131 (6)	10/69 (14)	ns
History of brain injury (%)	24/130 (18)	20/69 (29)	ns
Hypertension (%)	58/132 (44)	27/69 (32)	ns
Hyperlipidemia (%)	50/131 (38)	30/69 (43)	ns
Obesity (%)	31/109 (28)	10/61 (16)	ns
Depressive symptoms (%)	42/130 (32)	13/69 (19)*	.047

Abbreviation: ns, not statistically significant.
*Statistically significant P values.

3.2. Cognitive testing and assessment

Study participants were divided into three clinical suspicion groups: SCD (47%), MCI (44%), and dementia (9%). Table 2 indicates the baseline median cognitive test scores as well as the proportional differences in known cognitive risk factors between the three clinical suspicion groups. The SCD group scored significantly higher compared with

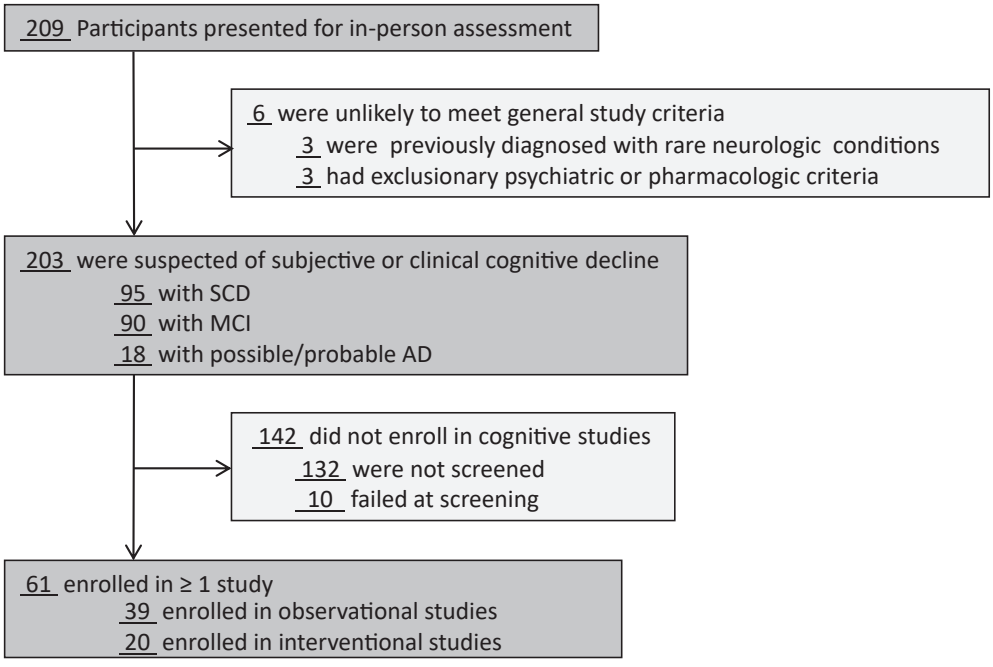

Fig. 2. Screening, assessment, and study enrollment among case-finding study participants.

Table 2
Baseline clinical testing, enrollment, and dementia risk factors by clinical suspicion

Characteristics	SCD (n = 95, 47%)	MCI (n = 90, 44%)	Dementia (n = 18, 9%)	*P* value SCD to MCI	*P* value SCD to dementia
Cognitive testing and enrollment					
MMSE (world)	30 (1)	28 (2)*	25 (4)*	<.001	<.001
MMSE (serial 7)	29 (2)	27 (3)*	24 (4)*	<.001	<.001
MoCA	27 (3)	23 (2)*	18 (3)*	<.001	<.001
MoCA–MRIS	23 (3)	18 (5)*	14 (7)*	<.001	<.001
GDS	3 (4)	3 (4)	1 (3)	ns	ns
CSDD	4 (6)	5 (5)	6 (5)	ns	ns
Study enrollment	22/95 (23%)	33/90 (37%)	6/18 (33%)	ns	ns
Cognitive risk factors					
Age, years	66 (8)	70 (8)*	75 (7)*	.002	<.001
Male	25/95 (26%)	35/90 (39%)	9/18 (50%)	ns	ns
Secondary education	88/90 (98%)	84/87 (97%)	11/15 (73%)*	ns	.004
Any alcohol consumption	74/93 (80%)	57/84 (68%)	12/16 (75%)	ns	ns
Smoking history	46/94 (49%)	37/90 (41%)	11/17 (65%)	ns	ns
Lives alone	22/90 (24%)	23/88 (26%)	2/17 (12%)	ns	ns
Family history of dementia	46/90 (51%)	31/86 (36%)*	9/18 (50%)	.049	ns
Heart disease	12/93 (13%)	22/89 (25%)	3/17 (18%)	ns	ns
Cerebrovascular accident	2/93 (2%)	2/90 (2%)	0/18 (0%)	ns	ns
Type 2 diabetes	7/93 (8%)	9/90 (10%)	2/17 (12%)	ns	ns
History of brain injury	19/93 (20%)	23/90 (26%)	2/17 (12%)	ns	ns
Hypertension	36/93 (39%)	40/90 (44%)	9/18 (50%)	ns	ns
Hyperlipidemia	30/93 (32%)	41/89 (46%)	9/18 (50%)	ns	ns
Obesity	18/80 (23%)	21/77 (27%)	2/13 (15%)	ns	ns
Depressive symptoms	27/93 (29%)	25/89 (28%)	3/17 (18%)	ns	ns

Abbreviations: MMSE, Mini–Mental Status Examination; MoCA, Montreal Cognitive Assessment; MRIS, memory recall index score; GDS, Geriatric Depression Scale; CSDD, Cornell scale for depression in dementia; ns, not significant.
Clinical tests reported as median values (interquartile range).
*Statistically significant *P* value.

the MCI and dementia groups on median Mini–Mental Status Examination and MoCA scores. The SCD group did not differ significantly on median Geriatric Depression Scale or Cornell Scale for Depression in Dementia scores compared with the MCI and dementia groups.

Known cognitive risk factors were compared between the SCD group and the MCI and dementia groups. SCD participants showed a significantly lower median age (66 years) versus the MCI group (70 years), and the dementia group (75 years). SCD participants also showed a significantly higher percentage with secondary education (98%) versus dementia participants (73%), and SCD participants with a known family history of dementia in a first degree relative (51%) versus MCI participants (36%).

3.3. Further participant enrollment in cognitive clinical studies

Further study enrollment was similar among the three clinical suspicion groups (Table 2): SCD (23%), MCI (37%), and dementia (33%). Fig. 2 shows the distribution of the overall enrolled participant cohort into observational studies and randomized controlled trials. Thirty percent of case-finding participants went on to enroll in research studies with 64% of this group enrolling in observational studies and 36% enrolling in interventional studies.

Table 3 shows the most common reasons for participant nonenrollment in cognitive research studies. Of the 142 case-finding participants who did not enroll in cognitive studies, 125 (87%) were represented by four reasons: participants declined further study enrollment (20%), study personnel did not follow-up with participants (22%), participants were ineligible for present observational studies or randomized controlled trials (20%), or participants lost interest in longitudinal follow-up (25%). The remaining 13% of participants who did not enroll in additional studies was represented by 7% who screened for additional studies and did not meet study enrollment criteria and 6% who were awaiting study screening.

Table 3
Frequency of explanations for non-enrollment in cognitive research among case-finding study participants

Non-enrollment explanations	n (%)
Lost interest in participation	36 (25)
No follow-up	31 (22)
Declined available studies	29 (20)
Ineligible for available studies	29 (20)
Screen fail	10 (7)
Other	7 (6)

Table 4
Case-finding study participants with longitudinal follow-up by clinical suspicion

Characteristics	SCD	MCI	Dementia	*P* value SCD to MCI	*P* value SCD to dementia
Number	62/95 (65%)	37/90 (41%)*	5/18 (28%)*	.001	.004
Age, years	66 (12)	68 (12)*	82 (2)*	.047	.003
Period, years	2 (4)	3 (4)	2 (2)	ns	ns
Number of visits	3 (2)	3 (3)	3 (1)	ns	ns

Abbreviation: ns, not significant.
Age, period, and number of visits reported as median (interquartile range).
*Statistically significant *P* value (<0.05) comparing MCI or dementia to SCD.

3.4. Longitudinal follow-up

After the first assessment, 104 of the 203 participants (51%) returned for ≥1 annual follow-up visit. This ranged from 1 follow-up visit to 8 follow-up visits and a minimum period of 1 year up to a maximum of 9 years. Table 4 details longitudinal data for participants based on their baseline clinical suspicion group. SCD participants comprised a significantly higher percentage of participants returning for longitudinal follow-up (65%) compared with the MCI group (41%) and the dementia group (28%). The median age in years was significantly higher in participants suspected of MCI (68 years) or dementia (82 years) when compared with participants suspected of SCD (66 years).

4. Discussion

This study examined the implementation of a novel community-based self-referral approach to identifying cognitive research candidates early in the spectrum of cognitive decline preceding dementia. We demonstrated the ability to engage potential research participants who expressed initial interest in cognitive research who might meet the criteria for SCD or MCI. Thirty percent of our "Case-Finding" participants successfully enrolled in one or more cognitive research studies and 51% maintained continued engagement with our research group with ongoing longitudinal follow-up.

This approach to single-site cognitive research study recruitment provides an additional strategy to the large-scale registries aimed at attracting interested people who are also at risk of cognitive decline. We engaged community-dwelling people with cognitive concerns and found most participants met a clinical suspicion for either SCD (47%) or MCI (44%) which placed them at early stages on the spectrum of cognitive decline preceding dementia. Use of community interest and self-referral thus provides an effective alternative approach to recruitment from specialist memory clinics where the referred patients may already have dementia or complex diagnoses that are often exclusionary for research studies. Our approach also supports the identification of people with cognitive concerns years before the onset of significant cognitive decline and before many have discussed their concerns with their family physician.

We reported 30% successful recruitment of "Case-Finding" participants to one or more cognitive research studies. Similar strategies that prescreened interested community-dwelling candidates for further cognitive research showed varying success in recruitment. For example, one strategy implemented a prevention registry that engaged strategic zip codes through a mailing campaign and subsequent prescreening of respondents which successfully enrolled approximately 15% of candidates considered ready to enter prevention trials [7]. A neuroimaging study in cognitively impaired older people implemented a prescreening approach that yielded 34% enrollment [17]. And finally, following a focused approach to community-based engagement and prescreening, Vidoni et al. reported an increase in successful study enrollment from 33% to 82% albeit over the span of a year [8]. Accordingly, the case-finding approach has shown viability on par with related recruitment strategies and warrants continued development and implementation.

Our case-finding methodology also involved sharing the participant's case conferencing and cognitive test information with their family physician. Although 111 of 194 participants (57%) in our study sample had already reported their cognitive concerns to their family physicians, this was the first time that many participants completed screening neurocognitive tests. Family physicians are often challenged by the time constraints of family practice and the uncertainty that can arise with managing cognitive concerns [18]. Sharing participants' cognitive testing with their family physicians often gave a first objective measure of a participant's cognitive concerns. The case-finding approach also helped build capacity with local family physicians and increased their awareness of the value of baseline and follow-up cognitive screening tests. In some instances, case-finding led to the clinical referral of people for further assessment in a specialist memory clinic. Case-finding may also shorten the wait time to address a person's cognitive concerns and may also reduce the anxiety that concerned individuals often face when waiting for a specialist memory clinic assessment.

In Ontario, Canada, a recent innovation in primary care is the Primary Care Collaborative Memory Clinic Model that trains specific family physicians and team members within a Family Health Team to manage the cognitive concerns of the older individuals served by the Family Health Team [19]. These Family Health Teams are supported by collaborating specialist geriatricians, geriatric

psychiatrists, and cognitive neurologists from specialist memory clinics.

Limitations to our approach primarily involved the 70% of participants who did not enroll in further cognitive research studies. Our analysis of the likely reasons behind this proportion of unenrolled case-finding participants suggested that 87% of our study participants who did not enroll in further studies were explained by modifiable reasons. Issues of participants losing interest in research, appropriate studies not available at the time, or not receiving follow-up from a research coordinator can be mitigated by facilitating longitudinal follow-up with participants as studies more fitting for a participant's interests may arise later in time. The case-finding study has been lead by several research coordinators at our site over the 9 years this study has been implemented. A research coordinator whose primary responsibility is focused on recruitment and retention of case-finding participants may improve continuity of follow-up with participants. We believe this will foster participant interest and provide education about new cognitive research studies.

Barriers to cognitive research study recruitment have been discussed and provide guidance for the continued development and optimization of case-finding methodology and implementation [20,21]. We have initiated steps to improve case-finding recruitment through advertising on Facebook which will help us connect with a broader demographic. Isaacson et al. utilized Facebook to promote an AD educational portal which most commonly registered participants in the 50-year-old age range [22]. As many cognitive research studies set age limit cutoffs beginning at $\geq$50 years of age, we plan to replicate a similar approach using advertising through Facebook.

To conclude, the case-finding study demonstrated an effective approach to engaging community-dwelling people with cognitive concerns and connecting case-finding participants with new cognitive research studies as they became available. We also supported the initiation of clinical management of nonurgent cognitive concerns by providing each case-finding participant's family physician with our clinical suspicion and cognitive tests. Our approach may help build capacity in primary care by raising awareness about screening cognitive tests in older adults who have persistent memory concerns. It also provides an additional strategy to support cognitive research and longitudinal follow-up of potential research participants.

Acknowledgments

Internal funding from the Cognitive Clinical Research Group supported the research coordinators' time, cost of advertisements, and the cost of mailings to family physicians. In the first year of implementing the case-finding study, the authors partnered with the Alzheimer Society of London and Middlesex to administer neurocognitive testing at a community event.

RESEARCH IN CONTEXT

1. Systematic review: The authors reviewed relevant publications regarding cognitive study research recruitment by performing focused literature searches in PubMed and Google Scholar. Cited publications capture some of the current strategies for identifying people with preclinical Alzheimer's disease, recruitment obstacles, and strategies to enhance recruitment.
2. Interpretation: This article presented the implementation and results of the case-finding approach that applied a community-based self-referral approach to recruiting participants early on the spectrum of cognitive decline. We also supported longitudinal participant follow-up and communication with primary care physicians.
3. Future directions: Based on current results, we aim to expand the current case-finding methodology to include social media advertising and continue to support cognitive research recruitment through community-based engagement and longitudinal follow-up.

References

[1] Corriveau RA, Koroshetz WJ, Gladman JT, Jeon S, Babcock D, Bennett DA, et al. Alzheimer's disease-related dementias summit 2016: National research priorities. Neurology 2017;89:2381–91.
[2] Rabin LA, Smart CM, Amariglio RE. Subjective cognitive decline in preclinical Alzheimer's disease. Annu Rev Clin Psychol 2017; 13:369–96.
[3] Jessen F, Amariglio RE, van Boxtel M, Breteler M, Ceccaldi M, Chételat G, et al. A conceptual framework for research on subjective cognitive decline in preclinical Alzheimer's disease. Alzheimers Dement 2014;10:844–52.
[4] Petersen RC, Smith GE, Waring SC, Ivnik RJ, Tangalos EG, Kokmen E. Mild cognitive impairment: clinical characterization and outcome. Arch Neurol 1999;56:303–8.
[5] Petersen RC. Mild cognitive impairment as a diagnostic entity. J Intern Med 2004;256:183–94.
[6] Petersen RC, Caracciolo B, Brayne C, Gauthier S, Jelic V, Fratiglioni L. Mild cognitive impairment: a concept in evolution. J Intern Med 2014;275:214–28.
[7] Aisen P, Touchon J, Andrieu S, Boada M, Doody R, Nosheny RL, et al. Registries and cohorts to accelerate early phase Alzheimer's trials. A report from the E.U./U.S. Clinical trials in Alzheimer's disease task force. J Prev Alzheimer's Dis 2016;3:68–74.
[8] Vidoni ED, Bothwell RJ, Burns JM, Dwyer JR. Novel recruitment models will drive Alzheimer's trial success. Alzheimers Dement 2018;14:117–9.
[9] Tombaugh TN, McIntyre NJ. The mini-mental state examination: a comprehensive review. J Am Geriatr Soc 1992;40:922–35.

[10] Molloy DW, Standish TI. A guide to the standardized Mini-Mental State Examination. Int Psychogeriatrics 1997;9:87–94. discussion: 143-50.
[11] Nasreddine ZS, Phillips NA, Bédirian V, Charbonneau S, Whitehead V, Collin I, et al. The montreal cognitive assessment, MoCA: a brief screening tool for mild cognitive impairment. J Am Geriatr Soc 2005;53:695–9.
[12] Kaur A, Edland SD, Peavy GM. The MoCA-Memory Index Score: an efficient alternative to paragraph recall for the detection of amnestic mild cognitive impairment. Alzheimer Dis Assoc Disord 2018; 32:120–4.
[13] Galvin JE, Roe CM, Xiong C, Morris JC. Validity and reliability of the AD8 informant interview in dementia. Neurology 2006;67:1942–8.
[14] Lawton MP, Brody EM. Assessment of older people: self-maintaining and instrumental activities of daily living. Gerontologist 1969; 9:179–86.
[15] Yesavage JA, Brink TL, Rose TL, Lum O, Huang V, Adey MB, et al. Development and validation of a geriatric depression screening scale: a preliminary report. J Psychiatr Res 1983;17:37–49.
[16] Alexopoulos GS, Abrams RC, Young RC, Shamoian CA. Cornell scale for depression in dementia. Biol Psychiatry 1988;23:271–84.
[17] Apostolova I, Lange C, Roberts A, Igel HJ, Mäurer A, Liese S, et al. Challenges in screening and recruitment for a neuroimaging study in cognitively impaired geriatric inpatients. J Alzheimers Dis 2017; 56:197–204.
[18] Pimlott NJG, Persaud M, Drummond N, Cohen Ca, Silvius JL, Seigel K, et al. Family physicians and dementia in Canada: Part 2. Understanding the challenges of dementia care. Can Fam Physician 2009; 55:508–509.e1-7.
[19] Lee L, Hillier LM, Heckman G, Gagnon M, Borrie MJ, Stolee P, et al. Primary care-based memory clinics: expanding capacity for dementia care. Can J Aging 2014;33:307–19.
[20] Watson JL, Ryan L, Silverberg N, Cahan V, Bernard MA. Obstacles and opportunities in Alzheimer's clinical trial recruitment. Health Aff (Millwood) 2014;33:574–9.
[21] Gauthie r S, Albert M, Fox N, Goedert M, Kivipelto M, Mestre-Ferrandiz J, et al. Why has therapy development for dementia failed in the last two decades? Alzheimers Dement 2016;12:60–4.
[22] Isaacson RS, Seifan A, Haddox CL, Mureb M, Rahman A, Scheyer O, et al. Using social media to disseminate education about Alzheimer's prevention & treatment: a pilot study on Alzheimer's Universe (www.AlzU.org). J Commun Healthc 2018;11:106–13.