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Original Article

Effects of the Davos Alzheimer's Collaborative early detection of cognitive impairment program on clinician attitudes, engagement, and confidence

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ABSTRACT

Background: The number of people with dementia is expected to grow substantially across the world due to population aging, but cognitive impairment remains undetected and undiagnosed, especially in early stages. Newly available diagnostic tools such as digital cognitive assessments and blood biomarker tests may be well suited to increase the rates of early detection of dementia in primary care.
Objectives: The objective of the Davos Alzheimer's Collaborative Healthcare System Preparedness (DAC-SP) Early Detection Flagship Program was to improve the rate of early detection of cognitive impairment in primary care and non-specialty settings. We aimed to understand the program's impact on clinician attitudes, engagement, and confidence in diagnosing and managing cognitive impairment.
Design: Survey of participating healthcare professionals before and after the intervention.
Setting: The DAC Healthcare System Preparedness Early Detection Flagship Program was implemented in seven sites across six countries: Brazil, Jamaica, Japan, Mexico, Scotland, and the United States (2 sites).
Participants: 110 healthcare professionals, including, primary care physicians, specialists (neurologists and psychologists), nurses, nurse practitioners, physician assistants, social workers, and healthcare support workers completed the pre-intervention survey. 68 healthcare professionals completed the post-intervention survey.
Intervention: Participating sites implemented a digital cognitive assessment tool and a blood biomarker test for the Alzheimer's pathology and were trained in the administration of the digital cognitive assessment tool. The intervention was adapted to each site for cultural relevance and operational feasibility.

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Measurements: Participants completed the General Practitioners Attitude and Confidence Scale for Dementia (GPACS-D), a 15-item scale with three subscales: Attitude to Care (six items), Confidence in Clinical Abilities (six items), and Engagement (three items). In addition to the subscale scores, the total GPACS-D score was reported.
Results: Across all sites, there was a significant increase in the Confidence in Clinical Abilities score from 2.98 (SD = 0.77) pre-intervention to 3.27 (SD = 0.72) post-intervention (p = 0.01), and in the total GPACS-D score from 3.48 (SD = 0.48) to 3.65 (SD = 0.39) (p = 0.01). There were non-significant increases in the Attitude to Care and Engagement scores across all sites.
Conclusions: The implementation of digital cognitive assessment tools and a blood biomarker test was associated with an increase in healthcare professionals' confidence in diagnosing and managing patients with cognitive impairment in primary care and non-specialty settings. Digital cognitive assessments and blood biomarker tests are promising tools that could be utilized in primary care to increase clinicians' confidence in detecting dementia and lead to timely clinical evaluation, treatment, and referral to supportive resources.

1. Introduction

Population aging is leading to a substantial increase in the number of people with dementia worldwide. In 2020, over 50 million people globally were living with dementia, a figure expected to more than double by 2050 [1]. Despite this growing burden, cognitive impairment remains largely undetected or detected late in much of the world. For instance, previous research from the United States (US) using Medicare data found that 92 % of predicted mild cognitive impairment (MCI) cases were undiagnosed [2], and another retrospective study using data from the Health and Retirement Study concluded that only about 26 % of incident dementia and 11 % of incident MCI cases received a timely diagnosis [3]. Further, Tsoy and colleagues report that racial/ethnic minority groups were even less likely to receive a timely diagnosis compared to white patients in a cross-sectional study of over 10,000 California Medicare fee-for-service beneficiaries [4]. Under-detection of cognitive impairment is also common in low- and middle-income countries [5]. For instance, a study in Brazil found that among individuals presenting with memory complaints and no previous dementia diagnosis, about a half received an MCI diagnosis, while a third received a dementia diagnosis [6].

Early detection of cognitive impairment is crucial, especially with the advent of disease-modifying treatments (DMT) for Alzheimer's disease, which are most effective in the disease's early stages. In addition, there is growing evidence that early enrollment into dementia care management programs improve patient and family caregiver outcomes [7]. In the US, for instance, the Centers for Medicare and Medicaid Services (CMS) recently implemented the Guiding an Improved Dementia Experience (GUIDE) program supporting the delivery of comprehensive, coordinated dementia care utilizing an alternative payment methodology [8,9]

Primary care physicians (PCPs) are well positioned to play an integral role in the detection of dementia, since they often serve as the first point of contact with the healthcare system [10]. However, barriers such as lack of training and guidance for dementia screening and diagnosis, and low confidence in recognizing and distinguishing different forms of dementia and interpreting cognitive screening and brain imaging results hinder early detection efforts in primary care [11,12]. In a survey of US physicians, only 50 percent of PCPs reported using a standardized cognitive screening test for over half of their patients with cognitive concerns [12]. Other barriers include lack of access to appropriate screening and diagnostic tools and difficulties incorporating dementia screening, diagnostic assessment, and specialist referrals within established clinical pathways and time [13]. In low- and middle-income countries, additional barriers include inadequate funding and training for non-communicable diseases, limited healthcare workforce, and restricted access to cognitive assessment tools, imaging, and biomarker tests [14].

The Davos Alzheimer's Collaborative (DAC) is a pioneering worldwide initiative with the goal to accelerate innovation and deliver solutions around the globe to transform Alzheimer's disease research, prevention, and care. The DAC Healthcare System Preparedness (DAC-SP) program aims to increase rates of cognitive screening, early detection, and accurate diagnosis of Alzheimer's disease and related dementias (ADRD) using implementation science [15]. In 2021, DAC-SP launched the Early Detection Flagship Program to facilitate the early detection of cognitive impairment in primary care and non-specialty settings. Seven sites in six countries: Brazil, Jamaica, Japan, Mexico, Scotland, and two sites in the US, were included in the program to understand the feasibility of implementing processes for early detection of cognitive impairment and identify the facilitators and barriers to implementing digital cognitive assessments (DCA) and a blood biomarker (BBM) test in existing primary and non-specialty care environments.

This paper reports on changes in participating healthcare professionals' attitudes, engagement, and confidence in detecting and managing cognitive impairment before to after the intervention. By evaluating these changes, we aim to understand the impact of the DAC-SP Early Detection Flagship Program on clinician readiness to address the growing challenge of dementia and inform future primary care based early detection initiatives and research.

2. Methods

2.1. Intervention design

The objective of the DAC-SP Early Detection Flagship Program was to improve the rate of early detection of cognitive impairment in primary care and non-specialty settings by implementing a digital cognitive assessment and a blood biomarker test. While there was a common framework for all study sites, each site had the flexibility to locally adapt the intervention so that it was culturally relevant and operationally feasible to test within their existing healthcare services and clinical workflow. Sites were provided with resources for staff training, a DCA tool, and a BBM test for Alzheimer's pathology. Staff training included education regarding administration of the DCA tool. Table 1 provides an overview of the intervention at each study site. Further site descriptions are documented in the Appendix, and detailed results of the intervention including the patient characteristics, DCA and BBM test results, and changes in clinical follow up will be reported in a separate publication.

2.2. Clinician survey

To measure the effect of the intervention on healthcare professionals' attitudes, engagement, and confidence about the detection and management of cognitive impairment, anonymous online surveys were administered to healthcare professionals at each site before and after the intervention. Across all sites, the median days between the pre and post surveys were 193 days, ranging from 140 days in Japan to 408 days in Brazil. The survey collected data on physician demographics, including sex, professional training, and years of practice. Surveyed healthcare professionals were categorized into PCPs, Specialists (neurologists, geriatricians and geriatric psychiatrists), Nurses/Nurse Practitioners/Physician Assistants, and Others (social workers and healthcare

Table 1
Description of the six study sites.

Country	Intervention
Brazil	The intervention was implemented in a public health clinic, whose care teams received training in Alzheimer's disease biology, symptoms, and diagnosis. Patients aged 60+ were invited to participate during routine primary care visits, clinic visits, and through a publication in a local newspaper. DCAs were administered and those with positive tests were given a blood biomarker test. Patients diagnosed with early-stage cognitive impairment were referred to a geriatrician, and those with late state disease to the local Alzheimer's center.
Jamaica	The intervention was implemented in a private healthcare system. Participant recruitment was conducted at eight primary care practices, one specialist practice, and via direct-to-consumer recruitment drives in communities. Physicians received an overview of ADRD and the study's diagnostic procedures. DCAs were administered by the research study team who acted as Brain Health Navigators. Those with positive or borderline results were offered fully subsidized blood and electrocardiogram tests for detection of potentially reversible causes of cognitive impairment. AD blood biomarker tests were not conducted in Jamaica due to local restrictions. The research team alerted the physicians and patients of their results and encouraged follow-up with medical and community-based care and services.
Mexico	The intervention was implemented in four primary care clinics in Mexico City's public health services. Participants aged 60+ were recruited during regular clinic visits. Healthcare professionals underwent pre-program training sessions. Participants were evaluated using the World Health Organization's Integrated Care for Older People Assessment (ICOPE) and DCA. Participants with positive DCA results were offered a blood biomarker test.
Scotland	The intervention was implemented as part of the established clinical pathway for dementia diagnosis in one Health Board area in Scotland. Services included two Primary Care general practices (one rural and one urban) where the DCA replaced the usual paper based cognitive assessment. The DCA was also implemented in Specialist services and offered to all people aged 60+ being assessed as part of the Nurse Led assessment pathway. The Lead Older Adult Psychiatrist retained decision making for blood biomarker testing. The Older Adult Psychology team used DCA in addition to neuropsychometric battery. All staff implementing the DCA completed training and practice in use of the tool.
US 1	The intervention was implemented through two pathways, outreach to patients via PCPs and direct-to-consumer campaign through social media. In both methods, participants 65+ self-administered the DCA online from home, with a potential follow-up screening at the clinic. Those patients who tested positive on the DCA had a secondary cognitive assessment (paper-pencil version of the MoCA).
US 2	The intervention was implemented in seven primary care practices of an integrated delivery system, including a large Family Medicine Residency program, a university-based primary care practice, two value-based care clinics, and three suburban primary care physician practices. DCAs were offered to patients aged 65+ arriving for a primary care appointment and those with abnormal scores were offered a blood biomarker test. A registered nurse acted as a Brain Health Navigator and was available to deliver an evidence-based protocol to facilitate evaluation for addressable causes and support primary care providers with further evaluation and connection to specialty care.

support staff). Due to the promise of confidentiality, we were unable to track respondents across pre and post surveys which led to attrition, and in some cases, different respondents answering the pre and post surveys. In addition, the Japanese site was not included in this analysis because they had a preexisting primary care dementia screening program which made the comparison of changes to a naïve baseline not possible.

We used the General Practitioners Attitude and Confidence Scale for Dementia (GPACS-D) to measure the changes in health professionals' attitudes, beliefs, and behaviors toward dementia diagnosis and management. GPACS-D is a 15-item scale with three subscales: Attitude to Care (six items), Confidence in Clinical Abilities (six items), and Engagement (three items) [16,17]. Responses are expressed in a 5-point Likert scale that ranged from "strongly disagree" to "strongly agree." The internal consistency and construct validity of the instrument was previously developed with a pilot test [18]. For each subscale and the total score, we summed the scores and divided by the number of items to give an average score out of 5.

2.3. IRB approval

The study protocols were approved by the Institutional Review Boards of each site, except for the site in Scotland, which conducted the study as a quality improvement project and US 2, which qualified the clinician survey as IRB exempt.

2.4. Analysis

Descriptive statistics were calculated to summarize the survey participants' characteristics. Changes in the three GPACS-D subscale scores and the overall score were calculated for each site. The scores were standardized so that subscale scores ranged from 1 to 5, allowing for comparison across subscales. As different clinicians may have participated in the baseline and the post-intervention survey, we used two-tailed *t*-tests for two samples. Analyses were conducted in Stata SE version 16.

3. Results

3.1. Sample characteristics

The study surveyed 110 healthcare professionals across all sites before the intervention and 68 after the intervention. Table 2 summarizes the sample characteristics. The pre-intervention sample comprised 62 % female and 75 % PCPs with an average of 11.88 years of practice (SD = 13.23). The total post-intervention sample had 62 % female and 72 % PCPs with an average of 15.52 years of practice (SD = 13.42).

3.2. Survey results

The changes in the GPACS-D subscales and total scores are presented in Tables 3 and 4, respectively. The intervention significantly increased the Confidence in Clinical Abilities score from a mean of 2.98 (SD = 0.77) pre-intervention to 3.27 (SD = 0.72) post-intervention (p = 0.01) across all sites, a 9.68 % increase in score. The Attitudes to Care subscale showed a non-significant improvement from 4.28 (SD = 0.62) to 4.42 (SD = 0.36) (p = 0.08), a 3.55 % increase in score. Engagement scores remained low, with a slight, non-significant increase from 2.86 (SD = 0.77) to 2.88 (SD = 0.78) (p = 0.84), a 1.13 % increase in score. Overall, the GPACS-D total score increased significantly from 3.48 (SD = 0.48) to 3.65 (SD = 0.39) (p = 0.01), a 5.26 % increase in score. The internal consistency of the subscales varied, with Cronbach's alpha values of 0.77 for the Attitudes, 0.43 for the Engagement, and 0.81 for the Confidence subscales, and 0.74 for the total GPACS-D score. The results among only the primary care physicians, who made up more than 70 % of both pre and post samples followed a similar pattern as the entire sample. PCPs had a non-significant increase in the Attitudes and Engagement subscales, a marginally significant increase in the Confidence subscale (p = 0.08), and a significant increase in the total GPACS-D score, from 3.41 (SD = 0.49) to 3.59 (SD = 0.39) (p = 0.03). The sample size of the other categories of healthcare professionals were too small for a meaningful comparison.

Table 2
Descriptive characteristics of the surveyed healthcare professionals.

	All Sites		Brazil		Jamaica		Mexico		Scotland		US 1		US 2	
Sample														
Pre	110		7		12		16		8		20		47	
Post	68		5		13		11		7		18		14	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Female														
Pre	68	61.8 %	6	85.7 %	4	33.3 %	14	87.5 %	7	87.5 %	12	60.0 %	25	53.2 %
Post	42	61.8 %	4	80.0 %	3	23.1 %	10	90.9 %	6	85.7 %	11	61.1 %	8	57.1 %
PCP														
Pre	83	75.5 %	7	100 %	12	91.7 %	6	37.5 %	1	12.5 %	11	55.0 %	46	97.9 %
Post	49	72.1 %	5	100 %	13	92.3 %	4	36.4 %	1	14.3 %	12	66.7 %	14	100 %
Specialist														
Pre	5	4.5 %	0	0 %	0	0 %	0	0 %	3	37.5 %	2	10.0 %	0	0 %
Post	3	4.4 %	0	0 %	0	0 %	0	0 %	1	14.3 %	2	11.1 %	0	0 %
Nurse/NP/PA														
Pre	17	15.5 %	0	0 %	0	0 %	6	37.5 %	3	37.5 %	7	35.0 %	1	2.1 %
Post	11	16.2 %	0	0 %	0	0 %	4	36.4 %	3	42.9 %	4	22.2 %	0	0 %
Other*														
Pre	5	4.5 %	0	0 %	0	0 %	4	25.0 %	1	12.5 %	0	0 %	0	0 %
Post	5	7.4 %	0	0 %	0	0 %	3	27.3 %	2	28.6 %	0	0 %	0	0 %
	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range
Years of Practice														
Pre	11.88 (13.22)	43	8.85 (15.74)	43	20.81 (14.52)	40	20.12 (12.95)	41	17.00 (14.91)	42	12.35 (11.01)	33	6.36 (10.68)	35
Post	15.52 (13.41)	45	10.60 (19.26)	44	25.33 (12.81)	40	19.54 (11.79)	33	15.85 (11.33)	34	13.72 (11.74)	33	7.85 (11.60)	35

*Other includes social workers and healthcare support workers.

Table 3
Changes in Attitude to Care, engagement, and Confidence in Clinical Abilities scores pre and post intervention.

	Attitude to Care				Engagement				Confidence in Clinical Abilities			
	Pre Mean (SD)	Post Mean (SD)	Diff	*P*	Pre Mean (SD)	Post Mean (SD)	Diff	*P*	Pre Mean (SD)	Post Mean (SD)	Diff	*P*
All sites	4.28 (0.62)	4.42 (0.36)	0.15	0.078	2.86 (0.77)	2.88 (0.78)	0.02	0.836	2.98 (0.77)	3.27 (0.72)	0.29*	0.013
Brazil	4.52 (0.28)	4.30 (0.38)	-0.22	0.265	3.00 (0.94)	3.47 (0.61)	0.47	0.357	3.02 (0.89)	3.40 (0.65)	0.38	0.434
Jamaica	4.44 (0.38)	4.35 (0.38)	-0.10	0.521	2.58 (0.45)	2.51 (0.38)	-0.07	0.675	3.13 (0.59)	3.13 (0.72)	0.00	0.990
Mexico	4.50 (0.66)	4.52 (0.36)	0.02	0.945	2.90 (0.62)	2.76 (0.67)	-0.14	0.585	3.50 (0.75)	3.39 (0.75)	-0.11	0.720
Scotland	4.33 (0.31)	4.62 (0.33)	0.29	0.107	2.75 (0.92)	2.10 (0.76)	-0.65	0.161	3.19 (0.51)	3.64 (0.39)	0.46	0.076
US 1	4.48 (0.32)	4.43 (0.32)	-0.06	0.589	3.48 (0.78)	3.43 (0.81)	-0.06	0.825	3.08 (0.91)	3.50 (0.75)	0.43	0.126
US 2	4.02 (0.74)	4.37 (0.40)	0.34	0.103	2.65 (0.71)	2.81 (0.61)	0.16	0.437	2.69 (0.68)	2.79 (0.60)	0.10	0.630

* $p < 0.05$

Table 4
Changes in the total GPACS-D score pre and post intervention.

	Pre Mean (SD)	Post Mean (SD)	Diff	*P*
All sites	3.48 (0.48)	3.65 (0.39)	0.18*	0.011
Brazil	3.62 (0.38)	3.77 (0.12)	0.15	0.405
Jamaica	3.54 (0.32)	3.49 (0.40)	-0.05	0.722
Mexico	3.78 (0.49)	3.72 (0.37)	-0.06	0.717
Scotland	3.56 (0.34)	3.72 (0.16)	0.17	0.259
US 1	3.72 (0.52)	3.86 (0.49)	0.14	0.416
US 2	3.21 (0.41)	3.42 (0.26)	0.21	0.076

* $p < 0.05$

Individual sites analysis did not show significant differences in the total and subscale scores ($p > 0.05$). However, 83 % of the sites had a numerical increase in the average Confidence score, 50 % in the Attitudes score, 33 % in the Engagement score, and 67 % in the total GPACS-D score. US 2 had the greatest increase in the Attitude score (0.34), followed by Scotland (0.29), while Brazil had the largest decrease (-0.22). The engagement score saw the highest numerical increase in Brazil (0.47) and decreased most in Scotland (-0.65). The Confidence score increased numerically the most in Scotland (0.46) and US 1 (0.43) and decreased only in Mexico (-0.11).

4. Discussion

The Davos Alzheimer's Collaborative's Healthcare System Preparedness Early Detection Flagship Program aimed to improve the rate of early detection of cognitive impairment in primary care and non-specialty settings by implementing innovative tools such as digital cognitive assessments and a blood biomarker test. As part of this program, the healthcare systems established new or modified clinical pathways for further evaluation and referral to specialists, if available. The significant increase in Confidence in Clinical Abilities and the total GPACS-D score suggests that the implementation of early detection using DCAs and providing the opportunity to use blood biomarker tests in the diagnostic process, positively impacted clinicians' confidence in diagnosing and managing dementia.

The high baseline Attitude scores align with previous studies, indicating that clinicians recognized the importance of early dementia detection but face barriers in training and support [13,19–22]. High Attitude and comparatively low Engagement and Confidence in Clinical Abilities scores at baseline are also consistent with other interventions that used the GPACS-D to measure their efficacy [18,23]. Unlike our intervention, which focused primarily on implementing digital cognitive assessments, the interventions reported by Mason and colleagues [18] and Perales-Puchalt and colleagues [23] were both dementia edu-

cation programs for healthcare providers that not only provided training on diagnosing and managing dementia but also highlighted concepts of patient empowerment and cultural competence, which may explain their significant improvements in the Engagement score compared with our program findings. The findings from the DAC-SP Early Detection Flagship Program suggest that clinicians agreed on the importance of early diagnosis and the role of physicians and caregivers in dementia care and management but may need targeted interventions and process redesigns to support their capacity to diagnose and manage dementia. This is an important finding, as promotion of early detection may not need to first focus on education of PCPs as previously suggested in the literature [19].

The DAC-SP Early Detection Blueprint (dacblueprint.org) [24], an open access microsite that was developed as an outcome of the Flagship Program, is one resource that could aid other healthcare systems and providers implementing early detection programs. Future interventions should explore the impact of training that specifically addresses physician engagement in the context of newly available diagnostic technologies and therapies. Further research is also needed into other factors, such as competing priorities and lack of health system infrastructure supporting screening, which could contribute to lower performance in settings of supportive attitudes by providers. Additional insights and learnings from the DAC-SP Early Detection Flagship Program, including qualitative findings and implementation results will be shared in future publications.

This study has certain limitations. First, the small sample size at individual sites restricted the ability to detect significant changes locally on the effects on healthcare professionals' attitude, confidence, and engagement. Future research could utilize both quantitative and qualitative methods to evaluate how local context impacted the results of the intervention [25]. Second, there was attrition of survey respondents from pre to post intervention and different respondents may have responded to the survey, which did not allow us to analyze individual-level changes. Third, a pre-post comparison without a contemporaneous comparison group does not allow ruling out the contribution of secular trends to the reported changes, and the open nature of the study exposes the survey respondents to expectation bias. Fourth, there was notable variability in the survey respondents' training type and years across sites. For instance, US 2 included a large number of resident physicians, who were in their first to third years of post-graduate residency training in Family Medicine. Finally, while the GPACS-D was developed and validated for general practitioners, the survey was completed by specialists, residents, nurses, nurse practitioners, physician assistants, social workers, and other healthcare support staff because they were integral to the clinical workflow during the Early Detection Flagship Program.

To summarize, the Davos Alzheimer's Collaborative's Healthcare System Preparedness Early Detection Flagship Program was associated with an increase in primary care providers' confidence in dementia diagnosis, care, and management. Implementation of early detection tools, including digital cognitive assessments and blood biomarker tests, could help improve providers' confidence in detecting cognitive impairment, accelerating access to clinical evaluation and community support networks. As part of an early detection implementation program, these newly available tools are promising methods of improving the early detection of cognitive impairment in primary care settings.

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Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Dr. Mattke reports grants from Davos Alzheimer's Collaborative, during the conduct of the study; grants from Biogen, grants from C2N, grants from Eisai, grants from Roche, personal fees from Biogen, personal fees from C2N, personal fees from Eisai, personal fees from Roche/Genentech, personal fees from Novo Nordisk, personal fees from Roche, personal fees from Novartis, and personal fees from Eli Lilly, outside the submitted work.

Dr. Ball reports being an independent contractor for Davos Alzheimer's Collaborative, during the conduct of the study; and a minor shareholder from Acumen Pharmaceuticals and Eli Lilly and Company, outside the submitted work.

Dr. Govia reports grants from Davos Alzheimer's Collaborative, during the conduct of the study; personal fees from Roche, personal fees from Scottish Brain Sciences, non-financial support from University of the West Indies, Mona, outside the submitted work; and after the completion of the field work), a fixed-term, part-time role with the WHO 's Brain Health Unit as a Senior Consultant working on the Implementation of the WHO's Blueprint for Dementia Research. Since September 2024, a core member of the CEOi's Digital Cognitive Assessments (DCA) Workstream B which is focused on barriers and facilitators of real-world implementation of DCAs. Since November 2023, founder and CEO of a UK-incorporated startup focused on using data-driven and tech-enabled solutions to address the treatment gap in brain health and dementia care.

Alison McKean reports grants from Davos Alzheimer Collaborative, during the conduct of the study.

Dr. MacLeod reports personal fees from Davos Alzheimer's Collaborative, during the conduct of the study.

Dr. Selzler is an independent contractor for the Davos Alzheimer's Collaborative, during the conduct of the study; Dr. Selzler is a minor shareholder of Eli Lilly and Company, outside the submitted work.

The rest of the authors have no interests to disclose.

CRediT authorship contribution statement

Tabasa Ozawa: Writing – review & editing, Writing – original draft, Formal analysis. **Katherine J. Selzler:** Writing – review & editing, Supervision, Project administration, Conceptualization. **Daniel E. Ball:** Writing – review & editing, Conceptualization. **Amy Deckert:** Writing – review & editing, Supervision, Project administration, Conceptualization. **Tim MacLeod:** Writing – review & editing, Supervision, Project administration, Conceptualization. **Otelo Corrêa dos Santos Filho:** Writing – review & editing, Investigation. **Ishtar Govia:** Writing – review & editing, Investigation. **Janelle N. Robinson:** Writing – review & editing, Investigation. **Hisatomo Kowa:** Writing – review & editing, Investigation. **Mariana Lopez-Ortega:** Writing – review & editing, Investigation. **Alison McKean:** Writing – review & editing, Investigation. **Wendy Chambers:** Writing – review & editing, Investigation. **Steven R. Smith:** Writing – review & editing, Investigation. **Magda Baksh:** Writing – review & editing, Investigation. **Deanna R. Willis:** Writing – review & editing, Investigation. **Nicole R. Fowler:** Writing – review & editing, Investigation. **Soeren Mattke:** Writing – review & editing, Writing – original draft, Supervision, Formal analysis.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.tjpad.2024.100038.

References

[1] Alzheimer's Disease International World alzheimer report 2015. Wimo Anders, Ali Gemma-Claire, et al., editors. Journal; 2015. (Issue).
[2] Mattke S, Jun H, Chen E, et al. Expected and diagnosed rates of mild cognitive impairment and dementia in the U.S. Medicare population: observational analysis. Alzheimers Res Ther 2023;15(1):128. doi:10.1186/s13195-023-01272-z.
[3] White L, Ingraham B, Larson E, et al. Observational study of patient characteristics associated with a timely diagnosis of dementia and mild cognitive impairment without dementia. J Gen Intern Med 2022;37(12):2957–65. doi:10.1007/s11606-021-07169-7.
[4] Tsoy E, Kiekhofer RE, Guterman EL, et al. Assessment of racial/ethnic disparities in timeliness and comprehensiveness of dementia diagnosis in california. JAMA Neurol 2021;78(6):657–65. doi:10.1001/jamaneurol.2021.0399.
[5] Kerwin D, Abdelnour C, Caramelli P, et al. Alzheimer's disease diagnosis and management: perspectives from around the world. Alzheimer's Dementia: Diagnosis, Assessm Disease Monitor 2022;14(1):e12334. doi:10.1002/dad2.12334.
[6] Pereira ML, Vasconcelos THFd, Oliveira AARd, et al. Memory complaints at primary care in a middle-income country: clinical and neuropsychological characterization. Dementia & Neuropsychol 2021:15.
[7] Kallmyer BA, Bass D, Baumgart M, et al. Dementia care navigation: Building toward a common definition, key principles, and outcomes. Alzheimer's & Dementia: Trans. Res. Clin. Intervent. 2023;9(3):e12408. doi:10.1002/trc2.12408.
[8] Yount RE. CMS announces GUIDE - A new dementia care model designed for participation by a range of providers. Mintz 2023.
[9] Centers for Medicare & Medicaid ServicesGuiding an improved dementia experience (GUIDE) Model. CMS 2024.
[10] Liss JL, Seleri Assunção S, Cummings J, et al. Practical recommendations for timely, accurate diagnosis of symptomatic Alzheimer's disease (MCI and dementia) in primary care: a review and synthesis. J Intern Med 2021;290(2):310–34. doi:10.1111/joim.13244.
[11] Bernstein Sideman A, Chalmer R, Ayers E, et al. Lessons from detecting cognitive impairment including dementia (DetectCID) in primary care. J Alzheimers Dis 2022;86(2):655–65. doi:10.3233/jad-215106.
[12] Bernstein A, Rogers KM, Possin KL, et al.. Dementia assessment and management in primary care settings: a survey of current provider practices in the united states, 19. BMC Health Services Research; 2019. p. 919. doi:10.1186/s12913-019-4603-2.
[13] Mansfield E, Noble N, Sanson-Fisher R, Mazza D, Bryant J. Primary care physicians' perceived barriers to optimal dementia care: a systematic review. Gerontologist 2018;59(6):e697–708. doi:10.1093/geront/gny067.
[14] Bernstein Sideman A, Al-Rousan T, Tsoy E, et al. Facilitators and barriers to dementia assessment and diagnosis: perspectives from dementia experts within a global health context. Front Neurol. 2022;13:769360. doi:10.3389/fneur.2022.769360.
[15] Ball DE, Mattke S, Frank L, et al. A framework for addressing Alzheimer's disease: without a frame, the work has no aim. Alzheimer's & Dementia 2023;19(4):1568–78. doi:10.1002/alz.12869.
[16] Mason RL, Annear MJ, Lo A, et al. Development and preliminary psychometric properties of the general practitioner attitudes and confidence scale (GPACS–D) for dementia. BMC Family Practice 2016;17(1):105. doi:10.1186/s12875-016-0506-z.
[17] Mason R, Doherty K, Eccleston C, et al. General practitioners attitude and confidence scale for dementia (GPACS-D): confirmatory factor analysis and comparative subscale scores among GPs and supervisors. BMC Family Practice 2019;20(1):6. doi:10.1186/s12875-018-0896-1.
[18] Mason R, Doherty K, Eccleston C, et al. Effect of a dementia education intervention on the confidence and attitudes of general practitioners in Australia: a pretest posttest study. BMJ Open 2020;10(1):e033218. doi:10.1136/bmjopen-2019-033218.
[19] de Levante, Raphael D. The knowledge and attitudes of primary care and the barriers to early detection and diagnosis of Alzheimer's disease. Journal 2022;58(Issue). doi:10.3390/medicina58070906.
[20] Arsenault-Lapierre G, Henein M, Rojas-Rozo L, et al. Primary care clinicians' knowledge, attitudes, and practices concerning dementia. They are willing and need support. 2021;67(10):731–735. 10.46747/cfp.6710731.
[21] Leung CW, Lam TP, Wong KW, Chao VKD. Early detection of dementia: The knowledge and attitudes of primary care physicians in Hong Kong. Dementia 2020;19(3):830–46. doi:10.1177/1471301218788133.
[22] FA Al-Awad, MA Al-Zahrani, Bawazeer AO, et al. Physicians' attitudes and confidence toward dementia care: a cross-sectional study at primary healthcare facilities in the Eastern Province, Saudi Arabia. J Family and Commun Med 2024;31(2):160–7. doi:10.4103/jfcm.jfcm_230_23.
[23] Perales-Puchalt J, Townley R, Niedens M, et al. Acceptability and preliminary effectiveness of a remote dementia educational training among primary care providers and health navigators. J Alzheimers Dis 2022;89(4):1375–84. doi:10.3233/jad-220235.
[24] Davos Alzheimer's Collaborative. The DAC-SP Early Detection Blueprint.
[25] Hawe P, Shiell A, Riley T, Gold L. Methods for exploring implementation variation and local context within a cluster randomised community intervention trial. J Epidemiol Commun Health 2004;58(9):788–93. doi:10.1136/jech.2003.014415.