



A survey of medical student education in dementia and delirium in Europe

Mary Faherty¹ · Catriona Curtin¹ · Lauren O'Mahony¹ · Tomas Welsh^{2,3,4} · Jos Tournoy^{5,6} · Pinar Soysal⁷ · Shibley Rahman⁸ · Hanna-Maria Roitto⁹ · Maria Cristina Ferrara¹⁰ · James Fisher^{11,12} · Yaohua Chen¹³ · Suzanne Timmons¹

Received: 20 May 2026 / Revised: 16 July 2026 / Accepted: 29 July 2026
© The Author(s) 2026

Key summary points

Aim To map the content, integration and pedagogical approaches used in dementia and delirium teaching within medical school curricula in Europe.

Findings Although dementia and delirium are included in most curricula, they are taught separately in half of instances. Teaching time is limited and mainly involves geriatricians, with infrequent interprofessional and experiential learning. Notable content gaps were also identified.

Message Comprehensive and consistent dementia and delirium education is needed across European medical schools to equip future doctors to prevent, diagnose and manage these complex conditions.

Abstract

Purpose Knowledge of dementia and delirium is essential for all clinicians. This survey aims to map the teaching of these two topics in European medical school curricula, in terms of content, linked learning, and pedagogical approach.

Methods A bespoke online survey was circulated to educators within universities providing medical student programmes (direct entry or graduate entry) across Europe, championed by the European Geriatric Medicine Society (EuGMS) Special Interest Group members and contacts sourced through institutions' websites. Responses (2024–2025) were limited to one per course.

Results The final dataset comprised 64 courses across 62 universities, from 17 countries. Dementia and delirium featured in 95% of curricula, taught separately in about half of instances. Typical teaching time was 3–4 h for dementia and 1–2 h for delirium, concentrated in later course years, and mainly involving geriatricians. Fewer than one-in-four courses incorporated interprofessional learning, most commonly with nursing; involving people with lived experience was rare. Young-onset dementia and decision-making capacity and supports were absent in > 25% of courses, while medications for cognitive and non-cognitive symptoms of dementia were absent in 19% and 13%, respectively. Content gaps for both dementia and delirium

✉ Mary Faherty
mfaherty@ucc.ie

¹ Centre for Gerontology and Rehabilitation, University College Cork, Cork, Ireland

² Research Institute for Brain Health, ReMindUK, Bath, UK

³ Royal United Hospitals Bath NHS Foundation Trust, Bath, UK

⁴ Bristol Medical School, University of Bristol, Bristol, UK

⁵ Department of Public Health and Primary Care, KU Leuven, Louvain, Belgium

⁶ Department of Geriatric Medicine, Universitair Ziekenhuis Leuven, Louvain, Belgium

⁷ Department of Geriatric Medicine, Faculty of Medicine, Bezmialem Vakif University, Istanbul, Turkey

⁸ School of Law and Social Justice, University of Liverpool, Liverpool, UK

⁹ Faculty of Medicine and Health Technology, Tampere University, Tampere, Finland

¹⁰ School of Medicine and Surgery, University of Milano-Bicocca, Milan, Italy

¹¹ School of Medicine, Newcastle University, Newcastle Upon Tyne, UK

¹² Northumbria Healthcare NHS Foundation Trust, Newcastle Upon Tyne, UK

¹³ University of Lille, Inserm, CHU Lille, JUNIA, U1352 - BioPrev - Bien vieillir: de l'inflammaging à la prévention, 59000 Lille, France

included local or national guidelines, communication strategies, and environmental design. Patient–student interaction in the clinical environment pre-graduation was not universal (72–73%), with gaps reported in nine countries.

Conclusion While dementia and delirium are broadly included in participating European institutions' medical student curricula, limited teaching time, infrequent interprofessional and experiential learning, and significant content gaps highlight the need for greater consistency and comprehensiveness to meet future healthcare needs.

Keywords Delirium · Dementia · Education · Curricula · Medical education

Introduction

Delirium and dementia are distinct syndromes, both of which contribute to cognitive decline [1]. Dementia is chronic and progressive, characterised by significant cognitive decline which may or may not be accompanied by neuropsychiatric symptoms [2], while delirium is an acute and fluctuating disturbance, primarily affecting attention, awareness, and sleep/wake cycles [2]. The presence of either dementia or delirium increases the risk of the other: an episode of delirium increases the risk of developing dementia approximately tenfold [3–6], while a person with dementia is at a greatly increased risk of delirium [6–8], termed delirium superimposed on dementia (DSD).

As the seventh leading cause of death globally and a major cause of disability, dementia has significant physical, psychological, social, and economic impacts [9]. Although the incidence of dementia at a given age in Europe has declined over the past 25 years [10], the overall ageing population means its prevalence in Europe is forecast to increase from 9 to 14 million by 2050 [11]. This trend reinforces the need for capacity within clinicians and healthcare systems, emphasising the importance of expertise in dementia assessment, diagnosis, and management. With dementia prevalence at 13–63% among older hospital inpatients [12], many of whom have other comorbidities [13], clinicians lacking the necessary knowledge and skills can unintentionally contribute to poorer patient outcomes.

Delirium is also common in hospitalised older adults, with prevalence rates ranging from 18 to 35% in general medical wards [14] and 25 to 53% in geriatric wards [14–17]. Delirium can negatively impact patient outcomes [18] and impose significant emotional and practical burdens on families and carers [19]. Since delirium has potentially reversible causes [20], prompt diagnosis by clinicians is important. Furthermore, delirium prevention or attenuation may lead to a reduced risk of dementia [1].

There are limited data describing dementia and delirium curricula for undergraduate medical students across Europe, although two UK surveys provide some country-level insights. A 2013 survey on dementia education found that, while responding medical schools (23/31) taught content on dementia and the majority formally assessed dementia learning outcomes, students had insufficient

exposure to people with dementia and their carers, with only three schools directly involving people with dementia and carers in teaching design and/or delivery [21]. Studies of European universities reveal significant inconsistencies in the time medical schools dedicate to dementia education [22, 23], which suggests variability in course content and depth. Such gaps are not limited to Europe, with a US study finding significant deficits in dementia knowledge among senior medical students [24]. For delirium, a 2006 survey of 784 trainee physicians in acute hospitals found that while 88% considered delirium to be treatable, only 21% reported good knowledge of delirium diagnostic criteria, less than a third (32%) recognised inattention as a core diagnostic feature, only 30% were confident in managing delirium, and only 8% reported the use of validated assessment tools [25]. A repeated survey in 2013 across the UK and Ireland ($n = 1,215$) found a marked increase in those reporting use of validated assessment tools (up from 8% in 2006 to 35% in 2013), although knowledge of diagnostic criteria remained poor [26].

This study aims to map how dementia and delirium curricula are taught across undergraduate and graduate-entry medical education courses in institutions in Europe, by answering the following research questions: i) How are dementia and delirium curricula positioned within medical student education programmes and relative to each other? ii) What is the nature of learning, teaching, and assessment practices relating to dementia and delirium curricula? iii) What is the content of dementia and delirium curricula in terms of breadth, depth, and notable gaps?

Methods

Study design

A quantitative study design, with expert participants voluntarily completing an anonymous online survey.

Survey design

The survey was developed by members of the European Geriatric Medicine Society (EuGMS) Delirium Special

Interest Group (SIG), in partnership with the Brain Health and Dementia SIG. The survey was built in the Qualtrics XM survey tool, hosted by University College Cork, Ireland. The survey, available in English only, comprised four sections: Demographics of the respondent and Course Details (21 items); Learning, Teaching and Assessment Practices (30 items); Content of the Dementia and Delirium Curricula (eight items); and Further Comments (six items). Most questions were quantitative (49 items) with some open-ended questions (16 items). Twelve questions were mandatory. The initial survey was developed over three online meetings involving nine members of the EuGMS Delirium and Brain Health and Dementia SIGs with a particular interest in education. Questions on potential curriculum content were based on their expert opinion and mapped to several existing published curriculum surveys [22, 26–28] and clinical practice guidelines [29–31] to identify gaps and suggest alternative wording of items. Further iterative refinements occurred via email correspondence.

The survey was piloted by each EuGMS SIG in November 2023, which included feedback on readability and flow. Pilot data were excluded from analysis. Estimated completion time was 20–25 min.

Sampling and recruitment

Eligible participants were a teacher or educator in an academic institution in a European country that provided an undergraduate- or graduate-entry medical student education programme, i.e. training future doctors. They did not have to teach directly the dementia and delirium course content but required knowledge of the same to accurately answer on behalf of the course. Participation was open to all ages and genders.

Recruitment was conducted using ‘snowball sampling’ [32]. EuGMS SIG members nominated champions who were asked to disseminate the survey within their professional networks, to lead teachers and educators in medical institutions. Participants were also identified through online sources, including institutions’ websites, and contacted directly by researchers via email.

Data collection and analysis

Data were collected from January 2024 to December 2025. Data analysis was completed using SPSS and Excel to produce simple descriptive statistics. Content analysis was applied to open-text responses, a method often used to analyse answers to open-ended survey questions [33]. Using phrases or partial sentences as the unit of analysis, inductive

coding was used to generate codes from the data. Analysis focused on the manifest content of responses as opposed to underlying latent meanings. Once coding was established, frequency counts quantified how often each code appeared across individual responses.

Data protection

Data access was limited to researchers analysing the data and the senior author. The survey did not collect personal data, and IP addresses were not recorded, but respondents were required to disclose their university. Qualtrics, a commercial survey platform with protections against unauthorised access, was used to collect data. Data exported from Qualtrics for analysis were securely stored on a university-hosted data storage platform.

Ethics approval

Ethics approval was obtained from the Social Research Ethics Committee in University College Cork, Ireland (Log no. 2023–170).

Informed consent

A detailed information page was provided to all participants outlining the purpose of the survey and how their data would be used. Informed consent was via a tick box in advance of survey commencement.

Results

Respondent demographics

Of the estimated 450 medical schools across Europe eligible to participate [34, 35], 62 were included in the results, suggesting a response rate of 14%. Of the 117 people who opened the survey (67 universities across 19 countries), 3 did not consent, 9 deemed themselves ineligible, 9 did not confirm eligibility (i.e. no response), and 24 did not complete the survey, i.e. did not answer at least 11 of the 12 mandatory questions (predefined criteria for inclusion) and did not answer at least 70% of Sections A–C. During data cleaning, one response from outside Europe was excluded and duplicates for the same university course ($n = 7$) were removed, as follows: when duplicate responses occurred, the retained response was a) the longest survey completion duration, where the respondent was involved in the original curriculum design and development or b) the most complete survey response. The final sample size of 64 respondents (i.e. 64 courses) covered 62 universities across 17 countries

(ref. Supplementary File 1) with a median 2 and mean of 3.8 respondents per country. As Türkiye accounted for almost a third of responses (20/64), sensitivity analysis was conducted to assess its influence. This involved comparing the results from the full dataset ($n=64$) with the dataset with Türkiye removed ($n=44$) for each individual question. This showed that although the distribution of results shifted, the overall pattern remained largely consistent with the full sample, i.e. the numerical values changed but the relative ordering was consistent (Supplementary File 2). Notable cases where Türkiye did change the results are described in the narrative. All percentages in the results are based on 64 responses, i.e. $N=64$, unless otherwise noted.

Most respondents (61%) held a professor/lecturer role, while others were identified as the head of university, school, department, or rector (13%), programme director (11%), practice tutor, or module coordinator (10%). Almost half (47%) were involved in the original curriculum design and development, while most (72%) were involved in ongoing design and development. Most courses (81%) were of 6 years duration, and 70% enrolled more than 140 students.

Course details

Course details (3% no response) most frequently pertained to direct entry courses (63%), defined as enrolment after senior school, while 34% were graduate-entry courses requiring students to complete a non-medical undergraduate degree prior to enrolment.

Both delirium and dementia were included in 95% of curricula, with a limited number of courses including either dementia only (3%) or delirium only (2%), both in Türkiye. There was an almost equal split between dementia and delirium being taught together within curricula or separately (see Fig. 1(i)). Only 64% of courses included mild cognitive impairment in their dementia curriculum. Dementia and delirium were very similarly embedded within core modules only (63%; 59% respectively), core and elective modules (both in 30% of cases), or elective modules only (6%; 5% respectively). Both syndromes were most often positioned in gerontology/geriatric medicine/geriatrics modules, followed by neurology, then psychiatry (Fig. 1(ii)). Neurology modules more often included dementia than delirium. For dementia, the most commonly reported total education duration was 3–4 h, compared to 1–2 h for delirium (Fig. 1(iii)). Most courses taught dementia and delirium in the latter years of the degree; see Fig. 1(iv)). For courses in Türkiye, delirium and dementia were more likely to be taught over multiple years (Supplementary File 2).

Where responses were provided ($n=32$), most curriculum updates occurred within the last 1–2 years ($n=18$). Others reported updates occurring 3–4 years ago ($n=4$),

5–10 years ago ($n=4$), or more than 10 years ago ($n=4$), with two respondents unsure.

Learning and teaching approaches

Both dementia and delirium had similar patterns for learning and teaching approaches. The environment was either face to face (in-person) only (59% for dementia, 55% for delirium) or a blend of face to face and online (38% for both dementia and delirium), with no modules fully online. The most common pedagogical methods and teaching strategies for both dementia and delirium (Fig. 2) were: lectures, bedside teaching, and case studies. Learning and teaching support was usually provided by a lecturer with clinical experience, mainly at consultant level. In 91% of courses, geriatricians provide the learning and teaching support. Neurologists (60% of dementia and 48% of delirium courses) and psychiatrists (49% for both dementia and delirium) also featured prominently, with fewer nurses and general practitioners (Fig. 2). Learning and teaching support was provided by one discipline in 20% of courses, two disciplines in 28% of courses, and three or more disciplines in 50% of courses, with one non-response.

Less than one in four courses incorporated interprofessional learning for dementia or delirium. When this did occur (14 courses across nine countries), multiple student disciplines were generally involved, the most common being nursing followed by psychology and occupational therapy (Fig. 2). Türkiye had a higher proportion of dementia/delirium courses being taught with nursing students compared to other countries (25/25% v. 18/16%; see Supplementary File 2).

Exposure to lived experience: classroom and bedside

A minority of courses (19%) engaged a person with direct or indirect lived experience in shaping the curriculum content. For dementia content, support was occasionally provided by people with lived experience of dementia or delirium, or their family or carers (18% with dementia experience, 15% with delirium experience). For delirium content, the figures were lower (8% with delirium experience, 9% with dementia experience). On content delivery, people with dementia and/or their carers or families were involved in 21% of courses, while people with direct or indirect delirium experience were involved in 20% of courses. Open-text responses ($n=10$) revealed involvement is mainly through “bedside practice” or “placements”, suggesting a patient rather than true educator role. Equally, student interaction with delirium or dementia patients in the clinical environment before graduation was not universal (72% and 73%, respectively) with omission of this experience reported across 9 countries

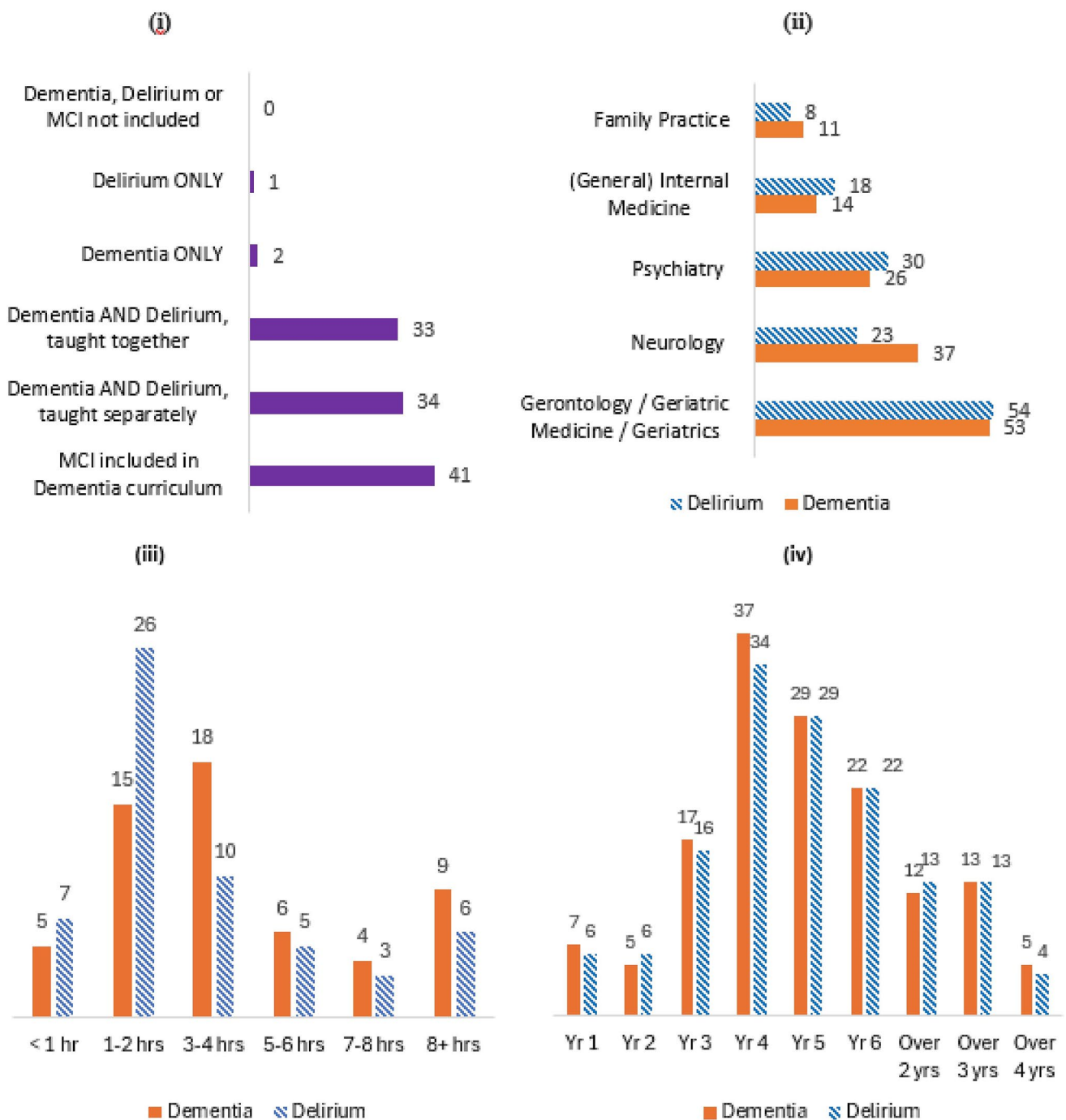


Fig. 1 **i** Inclusion of delirium and dementia in the curricula ($n=64$ for both); **ii** positioning of dementia and delirium within the curricula ($n=62$ for dementia; $n=61$ for delirium); **iii** number of learn-

ing hours for dementia and delirium ($n=57$ for both); **iv** timing of dementia and delirium teaching ($n=62$ for dementia; $n=60$ for delirium)

for dementia and 11 countries for delirium. One course collaborates with *Time for Dementia*, a UK initiative across ten universities, that facilitates healthcare students visiting people living with dementia in the community. Only one

course commented on in-classroom involvement, describing a 2 h session delivered by a family caregiver which “always gets brilliant feedback from students”.

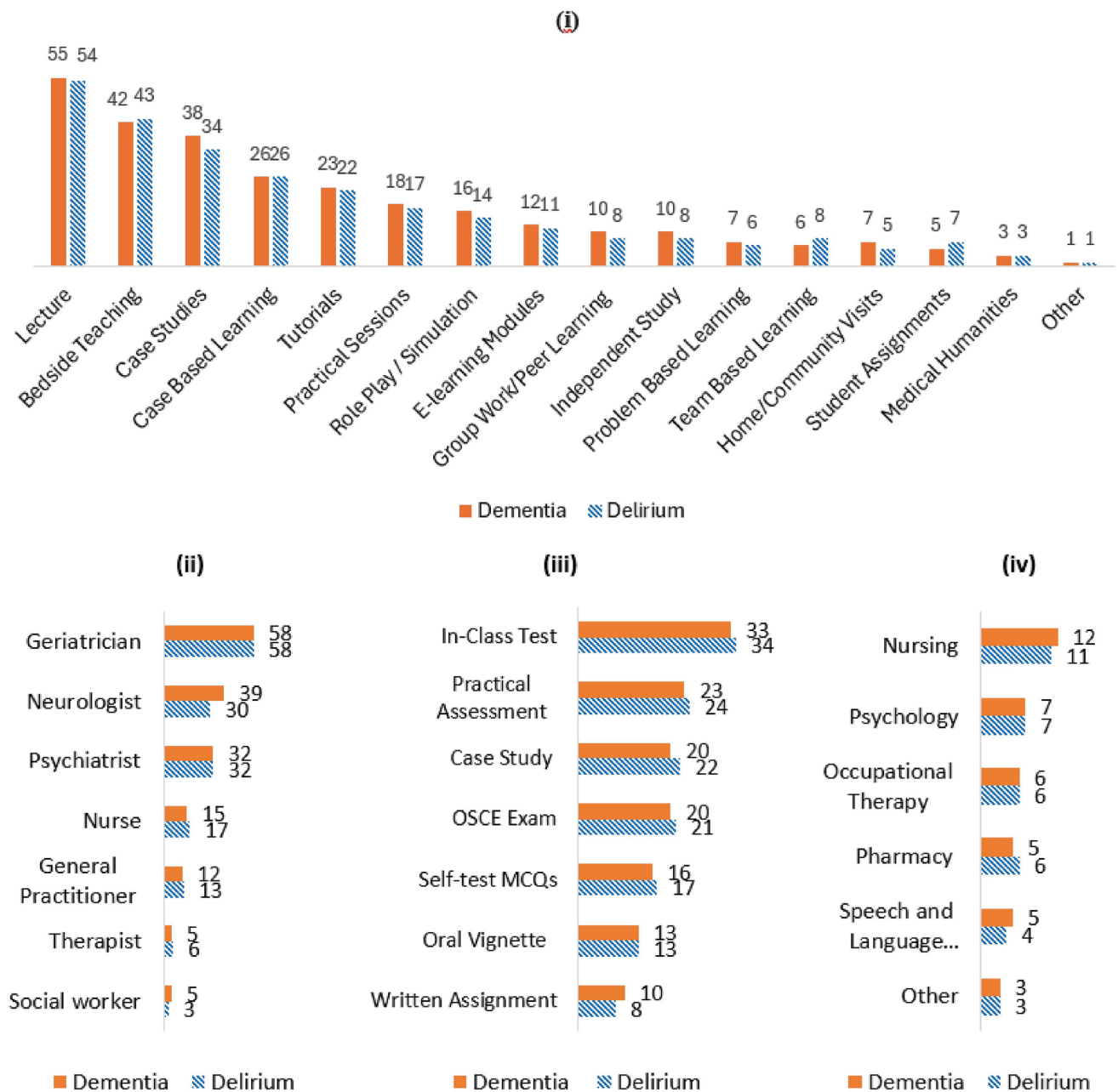


Fig. 2 **i** Pedagogical methods and teaching strategies ($n=61/60$ dementia/delirium). **ii** Professionals providing learning and teaching support ($n=64/63$ dementia/delirium). **iii** Learning assessments

utilised ($n=59/60$ dementia/delirium). **iv** Other students present in interprofessional learning ($n=38/37$ dementia/delirium)

Learning outcomes

Content analysis ($n=33/64$) detailing learning outcomes shows that clinical features ($n=13$), diagnosis ($n=14$), and management ($n=14$) are the most common for dementia, followed by causes of cognitive impairment and cognitive assessment tools (both $n=9$), with negligible focus on post-diagnostic support. For delirium, learning outcomes relating to management ($n=16$), risk factors ($n=10$) and aetiology

($n=9$) were reported more often than clinical features, prevention, screening, and diagnosis (all $n=8$).

Curriculum assessment

Curriculum assessment data for dementia and delirium ($n=60$ and $n=58$, respectively) was most often a blend of formative and summative (56% and 63%), followed by summative only (16% and 14%) and formative only (14%

and 11%), with a small proportion having no assessment on dementia or delirium content (6% and 3%). Learning assessment type was similar across dementia and delirium courses (Fig. 2). Courses in Türkiye had a different assessment profile, with practical assessments prioritised over some other assessment types (see Supplementary File 2).

Dementia and delirium curriculum content

For both dementia and delirium, respondents were asked to outline the frequency and depth of topic coverage in core and elective modules across three domains: epidemiology, demographics, and other general knowledge; assessment; and post-diagnostic support, treatment interventions. On the depth of topic, basic coverage referred to a surface-level introduction to a topic, while deep coverage referred to substantive teaching to support understanding

and application. To clarify the distinction, the survey used the example of epidemiology, whereby a basic level might consist of a single slide with national and global statistics, while a deep level could involve dedicating all or part of a lecture or tutorial covering global prevalence patterns, age-specific incidence rates, and social or ethnic differences. Respondents were not limited to one response, and some respondents selected two options, so that the total number of answers (including non-responses) varied from 65 to 72.

Dementia curriculum

In core modules, for general dementia learning, more than 75% of courses covered most of the background knowledge topics (Fig. 3). Just over two-thirds of courses' core modules covered epidemiology and features of behavioural and

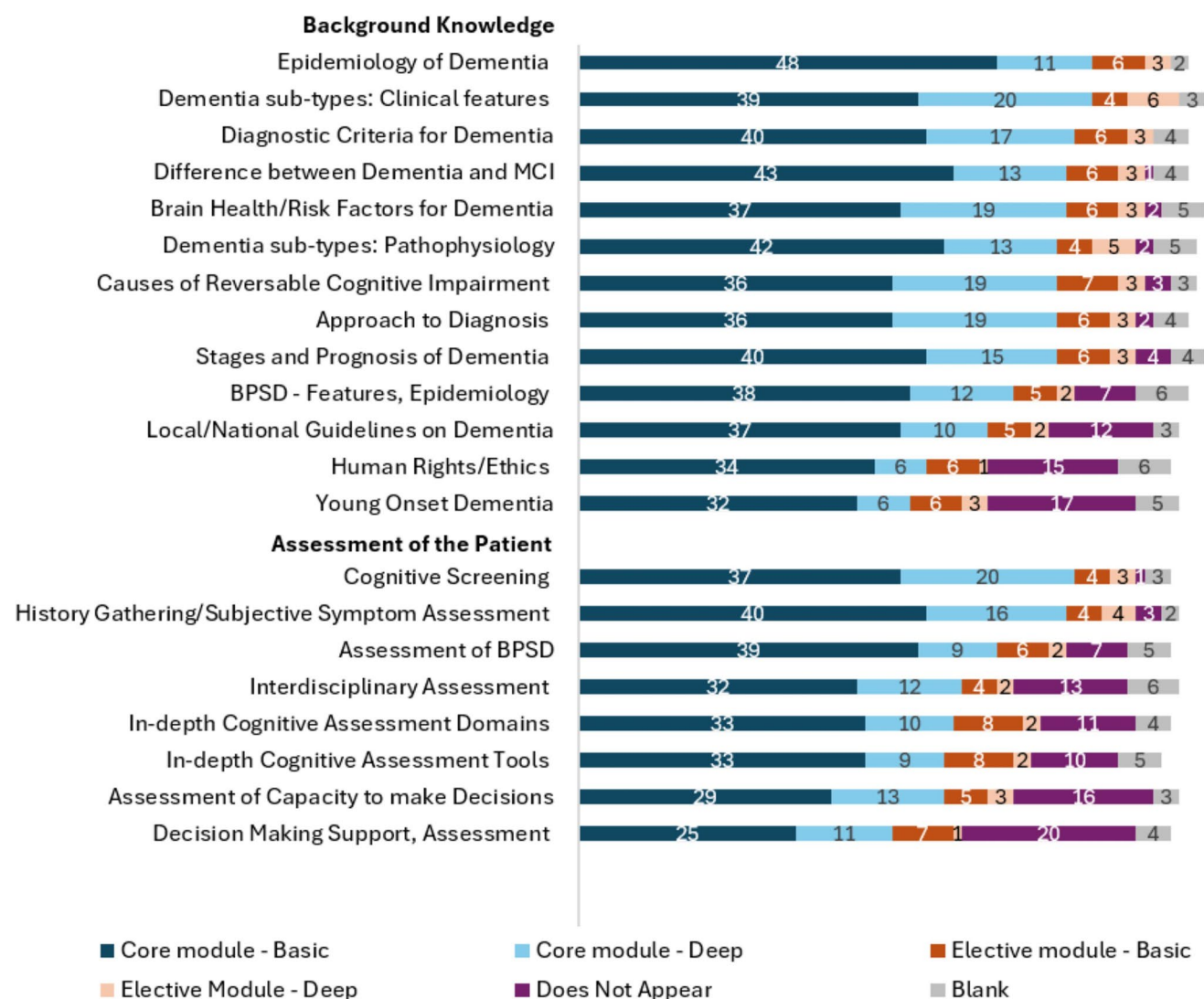


Fig. 3 Dementia curriculum content on background knowledge and assessment of the patient ($n=68-72$ responses per item)

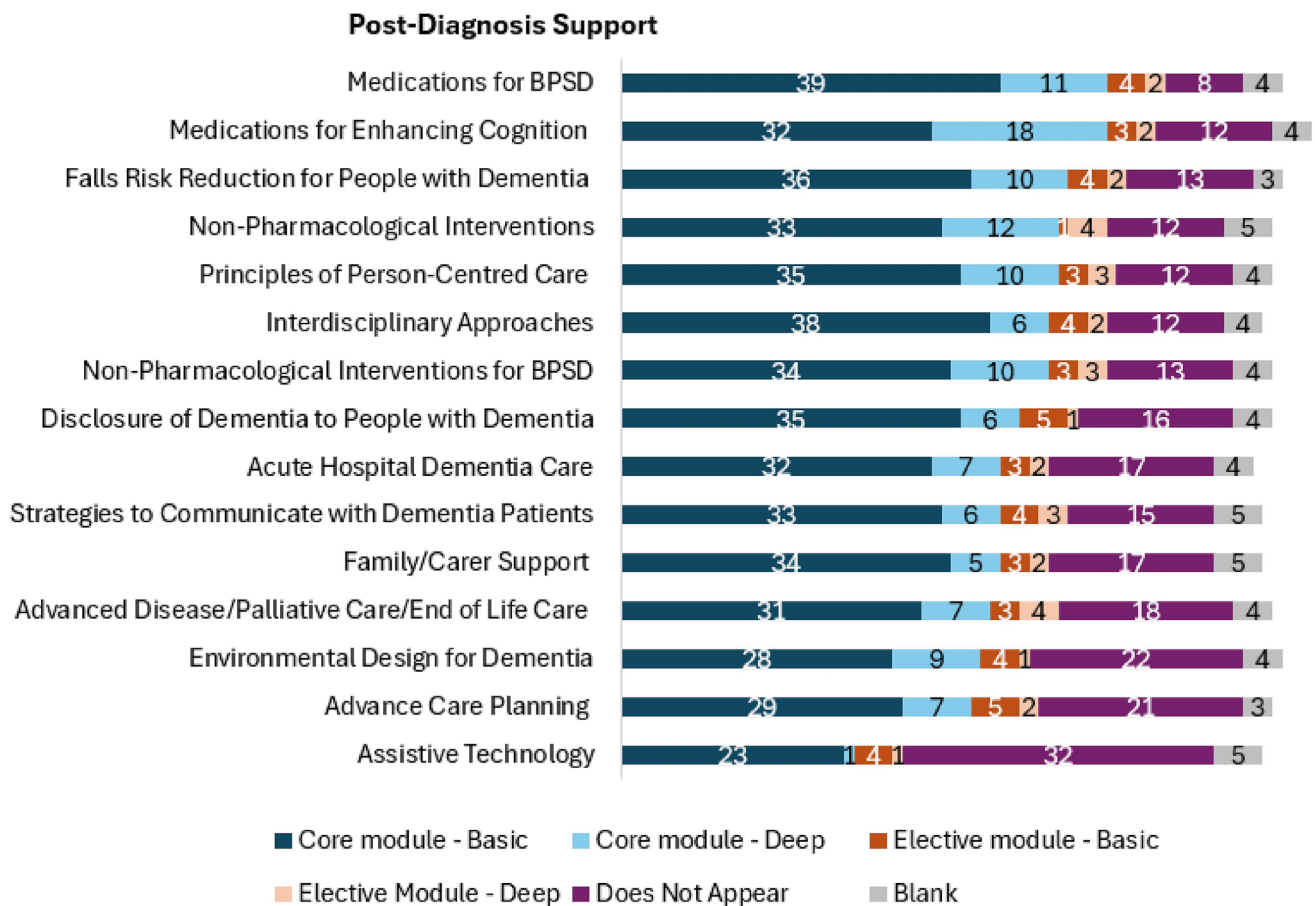


Fig. 4 Dementia curriculum content on post-diagnosis support ($n=66-71$ responses per item). *BPSD* behavioural and psychological symptoms of dementia

psychological symptoms of dementia (BPSD; also known as non-cognitive symptoms of dementia, NCSD), and local or national dementia guidelines. Notable curriculum absences were young-onset dementia (omitted in 17 courses from eight countries) and human rights or ethics (absent in 15 courses from 7 countries). Within patient assessment, more than 80% of courses' core modules included history gathering and subjective symptom assessment and cognitive screening, with assessment of BPSD also relatively high. Just under two-thirds of courses' core modules covered cognitive domains, cognitive assessment tools, and interdisciplinary assessment in-depth, along with the capacity to make decisions. However, decision-making *support* had the greatest coverage gap, absent in 31% of courses from seven countries. See Fig. 3.

For dementia post-diagnostic support, medications for BPSD and for enhancing cognition were absent in 13% and 19% of courses, respectively (across 4–5 countries); the least represented topics were assistive technology, advance care planning, and environmental design. See Fig. 4.

Delirium curriculum

For delirium, most core background knowledge topics were included but only two-thirds included content differentiating delirium from depression (Fig. 5). Treatment intervention topics most often missing were follow-up assessments (for detecting dementia), staff communication with patients, and interdisciplinary approaches. Pharmacological management and non-pharmacological approaches were included in 82% and 81%, respectively, of courses' core modules, with 10% and 12% of courses covering it in elective modules (6–7% non-responses). Local or national guidelines, recommendations, or algorithms did not appear in 20% of courses.

Educator opinions on curriculum strengths, weaknesses, and innovations

The survey's final section invited opinions on curricula strengths, weaknesses, and innovations. Of the 33 replies, the main strength identified was clinical exposure/patient contact ($n=10$). Responses emphasised patient contact

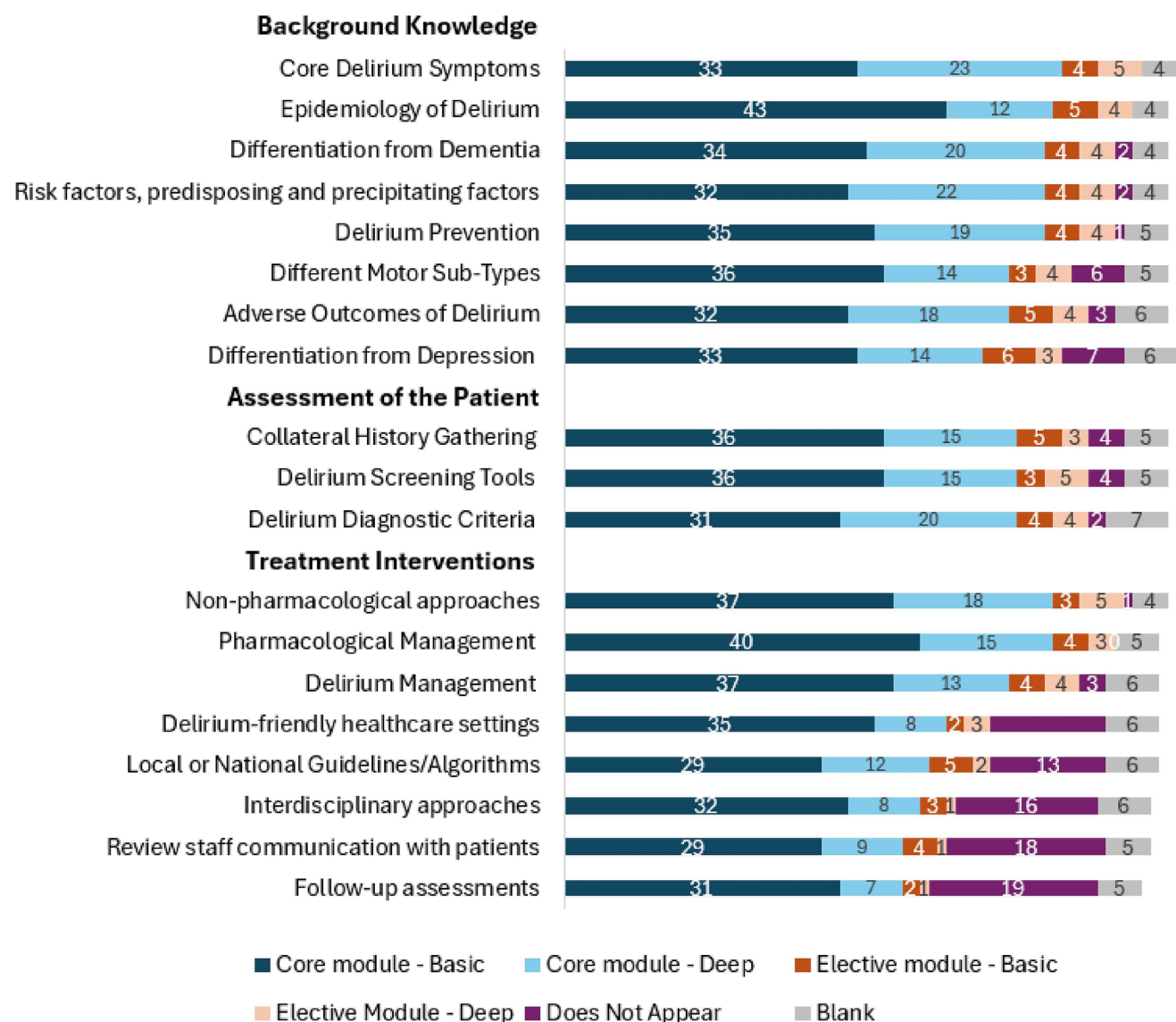


Fig. 5 Delirium curriculum content on background knowledge, assessment of the patient, and treatment interventions ($n=66$ – 69 responses per item)

through hospital placements, outpatient clinics, and community settings. Several responses emphasised the benefit of having experienced educators involved in course delivery, and valued dementia and delirium embedment across academic years and professions. One respondent noted their curriculum's strength was its focus "not just on knowledge but on attitudes to people with dementia" and its emphasis on compassion.

The most consistently cited weakness was the opposite of the main strength discussed above, i.e. limited involvement of people with lived experience ($n=10$). Respondents used phrases like "minimal involvement of ... family figures", "less contact with the patients and almost no longitudinal involvement", and "lack of involvement of patient relatives

in education", noting the missed opportunity to "make greater use of lived experience". One respondent sums it up as follows: "I think the main issue is not the curriculum but the delivery of the curriculum and lack of involvement of people with cognitive impairment".

Some identified interdisciplinary teaching as a strength ($n=8$), while others ($n=9$) flagged its absence as a weakness. One respondent noted this was due to interdepartmental coordination constraints: "interdisciplinary teaching would be nice, but we have tried and it is impossible to coordinate this with nursing and other disciplines". Another curricula weakness was insufficient learning time ("only limited hours"). A few respondents raised concerns about when the content was taught, with reports of being 'maybe a bit

too early” and “studied only at the 6th year (too late)” suggesting that placing the content early in the latter half of the course might be optimal. One respondent noted “delirium is almost never included”, while another noted “attendance is not compulsory and is often low” due to the elective nature of a module. Other weaknesses were insufficient clinical exposure ($n=2$), an overly theoretical focus ($n=2$), and limited structured simulation or case-based training ($n=2$).

On innovative approaches, patient cases and problem-solving were the most widely cited ($n=9$). Simulation ($n=5$) was the second most prominent theme. A minority ($n=4-5$) identified patient contact and experiential learning, small group workshops and interprofessional teams as innovative approaches. Two respondents highlighted digital learning tools and flipped-classroom models, while one respondent noted carer involvement in curriculum delivery. One detailed response highlighted reflective practices alongside multiple other methods, while another suggested a delirium experience game. Engaging civil society groups to facilitate contact between students and people with lived experience, as noted earlier under patient involvement, could also be viewed as an innovative approach.

Discussion

This study aimed to assess dementia and delirium curricula within medical student education programmes in Europe, as students’ dementia and delirium education is essential to reduce the risk of, diagnose, and manage these complex conditions. Our finding that geriatricians, psychiatrists and neurologists are the medical specialties most often involved in teaching dementia and delirium aligns with other studies [23, 36, 37]. The placement of dementia and delirium within gerontology or geriatric medicine could reflect our recruitment strategy (mainly via EUGMS SIGs) but it is also unsurprising, given that older adults are the primary cohort affected by both conditions. However, this positioning risks inadvertently signalling dementia and delirium as problems of old age, rather than core competencies required by all clinicians.

Interprofessional learning can strengthen dementia education and training [38, 39], improve communication with patients and colleagues [39, 40], and increase students’ understanding of collaboration in healthcare [40, 41]. While these components are central to good quality patient care, our survey revealed fewer than one in four courses included interprofessional learning and teaching. Educators recognised this gap as a significant weakness, indicating broad agreement on it being a priority area for improvement. Only a small number of courses involve people with a lived experience of dementia or delirium. However, when people with

lived experience are included, respondents noted it was a key curriculum strength. Student interaction with patients in the clinical environment pre-graduation was not universal (72–73%), although evidence shows contact with people with dementia is a better predictor of students’ dementia knowledge than geriatric-specific training [42], and experiential patient-centred education can improve attitudes and knowledge [43, 44]. As many medical graduates will spend all or part of their careers caring for an ageing population, pre-graduation experiences can equip them to deliver safe, effective, and compassionate care and be future advocates for a highly vulnerable population. These findings mirror trends in European geriatric medicine education more broadly: a recent scoping review highlighted an increased focus on interprofessional education, intergenerational contact, clinical placements and patient communication [45], while multidisciplinary team work, prescribing, and ethical and legal issues are core concepts in the British Geriatrics Society undergraduate curriculum in geriatric medicine [46]. A scoping review found that in Europe, there are gaps in geriatric learning in undergraduate medical curricula including cognitive assessment, and decision-making capacity, while some topics such as medication use and multidisciplinary teamwork are covered in most [47].

Within dementia curricula, the largest gaps were post-diagnosis support, decision-making support, and medications for cognitive and non-cognitive symptoms. Omitting post-diagnostic support may imply to students that this is not a doctor’s role, although physicians are key to identifying unmet needs, coordinating multidisciplinary teams, and linking to supports. The omission of learning on medication is more concerning, given that prescribing, deprescribing and medication optimisation are core medical doctor responsibilities. Even if not prescribing cognitive enhancers, doctors still need to understand mechanisms of action, side-effects, withdrawal effects, and medications that might adversely affect cognition. Given the significant safety concern around medications used for non-cognitive symptoms of dementia [48], all medical students require education on this topic. As new medications that clear culprit proteins become widespread in clinical practice, ‘medications for dementia’ may assume a greater importance in curricula, although a focus on these novel agents should not detract from symptomatic treatments and non-pharmacological interventions.

The omission of decision-making support is potentially concerning, given all doctors need to be able to assess and maximise decision-making capacity, although this topic may be covered in other modules. Young-onset dementia was absent in 26% of courses, despite accounting for up to 9% of dementia cases [49]. This may lead to misconceptions that dementia only occurs in older people, perpetuating diagnostic delays and reduced access to support for younger patients [50]. Our respondents may have biased this

response, as young-onset dementia may have less direct relevance in geriatric-specific curriculum.

The greater focus on delirium management over prevention in learning outcomes suggests management may be prioritised over prevention. This aligns with a 2025 modified Delphi study of Irish delirium experts which ranked health-care students' delirium education priorities as treatment first, followed by assessment and diagnosis, then prevention [51]. Only two-thirds of delirium courses included content differentiating delirium from dementia. Given their overlapping symptoms [8], this gap risks students graduating without a basic understanding of how to distinguish between them.

Both dementia and delirium courses had coverage gaps on local or national guidelines and environmental design. High quality clinical guidelines provide evidence-based recommendations designed to standardise and improve patient care [52, 53], and may be operationalised for local practice, and subject to audit. Students unaware of such guidelines may be slower to adopt evidence-based practices. However, our findings may not reflect a true lack of focus on “guidelines” per se, since some countries without local or national guidelines may be guided by international recommendations. Equally, it could be argued that for undergraduates, it is most important to learn the core concepts of a disease, while guidelines are more relevant once they are in clinical practice and encountering clinical issues. Environmental design modifications, including low-cost adaptations, have the potential to yield positive outcomes in patient care [54, 55]. While doctors rarely lead design changes, students should be aware of the impact poor lighting, mobility restriction, excessive noise, and day-night obscuration have on cognitive function and delirium, and act as advocates for environmental design in healthcare [56, 57]. Environmental design may be covered in other parts of the medical student training, although open-text responses did not indicate this, and we acknowledge that it may correctly not be considered a priority in an already full curriculum.

Reported innovations included patient cases, problem-solving, simulations, experiential learning, and interprofessional education. These topics align with a dementia education scoping review, which identified five categories of innovation in undergraduate programmes: long-term experiential learning, activity-centred programmes, interprofessional education, immersive conference-style programmes, and dementia simulation [44]. While this review relates to dementia, many of the innovations are also relevant to delirium. A UK delirium survey identified attitudinal or cultural change, clinical and multidisciplinary exposure, and technology innovations as key areas for future teaching [37].

As national strategies can serve as a catalyst for curriculum change [21], policymakers should consider whether the gaps identified in this survey warrant explicit inclusion in such frameworks. For educators, these findings suggest key

areas for consideration when revising curricula. The true status of dementia and delirium curricula across Europe may be worse than presented here, given the 14% response rate and the likelihood that institutions with comprehensive curricula were more likely to participate.

Although this survey was designed and piloted by specialist educators in dementia and delirium, several limitations must be acknowledged. Professional networks were utilised to disseminate the survey across Europe; however, this resulted in uneven geographical representation, with some countries absent and others (notably Türkiye) disproportionately overrepresented. Eligibility to participate was based on unverified self-report, which may limit reliability. Voluntary participation may have introduced selection bias, whereby individuals with a particular interest in dementia or delirium education were more likely to respond. Although participants were required to be teachers or educators in a medical school, they did not have to directly teach dementia and delirium, which could reduce the accuracy of the findings. The survey was administered in English only, with no translated versions available. This has several implications. One respondent noted that, as a non-English speaker, the terminology was difficult to interpret and map to their country context. It is likely that this challenge was experienced by others and could lead to measurement error when a nuanced understanding of terms was required. The absence of a survey in a respondents' native language is likely to have contributed to the low response rate, leading to non-response bias in the data and skewing the representation of the dataset.

Conclusion

While dementia and delirium are broadly included in participating European institutions' medical student curricula, the limited teaching time, infrequent interprofessional and experiential learning, and content gaps highlight the need for greater consistency and comprehensiveness, a significant challenge in an already overcrowded medical curriculum.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s41999-026-01572-1>.

Author contributions Conceptualisation and methodology: TW, JT, PS, SR, HMR, MCF, JF, YC, ST; formal analysis: MF; data curation: MF; writing—original draft: MF; writing—review and editing: all authors; supervision: ST; project administration: CC, LOM.

Funding This study is unfunded.

Data availability A pooled anonymous dataset may be shared on reasonable request, by contact with the senior author.

Declarations

Conflict of interest All authors have no competing interest to declare for this article.

Ethical approval

Ethical approval was obtained from the Social Research Ethics Committee in University College Cork, Ireland.

Informed consent A detailed information page was provided to all participants outlining the purpose of the survey and how their data would be used. Informed consent was via a tick box in advance of starting the survey.

Consent to publish Participants were informed that the information provided might be used in research publications or conference presentations. They gave informed consent on that basis.

Open Access This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

References

1. Umoh ME, Fitzgerald D, Vasunilashorn SM, Oh ES, Fong TG (2024) The relationship between delirium and dementia. *Semin Neurol* 44(6):732–751. <https://doi.org/10.1055/s-0044-1791543>
2. American Psychiatric Association (2022) Diagnostic and statistical manual of mental disorders, fifth edition, text revision (DSM-5-TR). American Psychiatric Publishing Inc., Washington DC
3. van Munster BC, Strijker F, Trzpis M, Slooter AJC, van den Boogaard M, Ottens TH (2025) Delirium: a modifiable risk factor for dementia. *Eur Geriatr Med*. <https://doi.org/10.1007/s41999-025-01360-3>
4. Pereira JVB, Aung Thein MZ, Nitchingham A, Caplan GA (2021) Delirium in older adults is associated with development of new dementia: a systematic review and meta-analysis. *Int J Geriatr Psychiatry* 36(7):993–1003. <https://doi.org/10.1002/gps.5508>
5. Hwang G, Park C, Son SJ, Roh HW, Hwang JY, Jang JW et al (2025) Long-term impact of delirium on the risk of dementia in hospitalized older patients: a real-world multicenter study. *Am J Geriatr Psychiatry* 33(2):123–139. <https://doi.org/10.1016/j.jagp.2024.08.004>
6. Fong TG, Inouye SK (2022) The inter-relationship between delirium and dementia: the importance of delirium prevention. *Nat Rev Neurol* 18(10):579–596. <https://doi.org/10.1038/s41582-022-00698-7>
7. Ahmed S, Leurent B, Sampson EL (2014) Risk factors for incident delirium among older people in acute hospital medical units: a systematic review and meta-analysis. *Age Ageing* 43(3):326–333. <https://doi.org/10.1093/ageing/afu022>
8. Fong TG, Davis D, Growdon ME, Albuquerque A, Inouye SK (2015) The interface between delirium and dementia in elderly adults. *Lancet Neurol* 14(8):823–832. [https://doi.org/10.1016/S1474-4422\(15\)00101-5](https://doi.org/10.1016/S1474-4422(15)00101-5)
9. World Health Organization. Dementia. World Health Organization; 2025. <https://www.who.int/news-room/fact-sheets/detail/dementia>. Accessed 10 Mar 2026.
10. Wolters FJ, Chibnik LB, Waziry R, Anderson R, Berr C, Beiser A et al (2020) Twenty-seven-year time trends in dementia incidence in Europe and the United States: the Alzheimer Cohorts Consortium. *Neurology* 95(5):e519–e531. <https://doi.org/10.1212/WNL.0000000000001002>
11. Alzheimer Europe. The Prevalence of Dementia in Europe 2025. https://www.alzheimer-europe.org/sites/default/files/2026-01/alzheimer_europe_-_dementia_prevalence_report_2025_-_final_-_digital.pdf. Accessed 20 Mar 2026.
12. Mukadam N, Sampson EL (2011) A systematic review of the prevalence, associations and outcomes of dementia in older general hospital inpatients. *Int Psychogeriatr* 23(3):344–355. <https://doi.org/10.1017/S1041610210001717>
13. Browne J, Edwards DA, Rhodes KM, Brimicombe DJ, Payne RA (2017) Association of comorbidity and health service usage among patients with dementia in the UK: a population-based study. *BMJ Open* 7(3):e012546. <https://doi.org/10.1136/bmjopen-2016-012546>
14. Inouye SK, Westendorp RGJ, Saczynski JS (2014) Delirium in elderly people. *Lancet* 383(9920):911–922. [https://doi.org/10.1016/S0140-6736\(13\)60688-1](https://doi.org/10.1016/S0140-6736(13)60688-1)
15. Bellelli G, Morandi A, Di Santo SG, Mazzone A, Cherubini A, Mossello E et al (2016) “Delirium day”: a nationwide point prevalence study of delirium in older hospitalized patients using an easy standardized diagnostic tool. *BMC Med* 14(1):106. <https://doi.org/10.1186/s12916-016-0649-8>
16. Azizi Z, O'Regan N, Dukelow T, Bohane T, Harkin E, Donnellan C et al (2024) Informal judgement of delirium status underestimates delirium prevalence: World Delirium Awareness Day point prevalence results from Ireland. *Delirium*. <https://doi.org/10.56392/001c.92222>
17. Ryan DJ, O'Regan NA, Caoimh RÓ, Clare J, O'Connor M, Leonard M et al (2013) Delirium in an adult acute hospital population: predictors, prevalence and detection. *BMJ Open* 3(1):e001772. <https://doi.org/10.1136/bmjopen-2012-001772>
18. Witlox J, Eurelings LSM, de Jonghe JFM, Kalisvaart KJ, Eikelenboom P, van Gool WA (2010) Delirium in elderly patients and the risk of postdischarge mortality, institutionalization, and dementia: a meta-analysis. *JAMA* 304(4):443–451. <https://doi.org/10.1001/jama.2010.1013>
19. Schmitt EM, Gallagher J, Albuquerque A, Tabloski P, Lee HJ, Gleason L et al (2019) Perspectives on the delirium experience and its burden: common themes among older patients, their family caregivers, and nurses. *Gerontologist* 59(2):327–337. <https://doi.org/10.1093/geront/gnx153>
20. Wilson JE, Mart MF, Cunningham C, Shehabi Y, Girard TD, MacLulich AM et al (2020) Delirium. *Nat Rev Dis Primers* 6(1):90. <https://doi.org/10.1038/s41572-020-00223-4>
21. Tullo ES, Gordon AL (2013) Teaching and learning about dementia in UK medical schools: a national survey. *BMC Geriatr* 13:29. <https://doi.org/10.1186/1471-2318-13-29>
22. Tullo E, Allan L (2011) What should we be teaching medical students about dementia? *Int Psychogeriatr* 23(7):1044–1050. <https://doi.org/10.1017/S1041610211000536>
23. Tsolaki M, Papaliagkas V, Anagnostis G, Bernabei R, Emre M, Frolich L et al (2010) Consensus statement on dementia education and training in Europe. *J Nutr Health Aging* 14(2):131–135. <https://doi.org/10.1007/s12603-009-0238-z>
24. Padala KP, Mendiratta P, Orr LC, Dean KT, Boozer EM, Lensing SY et al (2020) An Interdisciplinary Approach to Educating Medical

- Students About Dementia Assessment and Treatment Planning. *Fed Pract* 37(10):466–471. <https://doi.org/10.12788/fp.0052>
25. Davis D, MacLulich A (2009) Understanding barriers to delirium care: a multicentre survey of knowledge and attitudes amongst UK junior doctors. *Age Ageing* 38(5):559–563. <https://doi.org/10.1093/ageing/afp099>
 26. Jenkin RPL, Al-Attar A, Richardson S, Myint PK, MacLulich AMJ, Davis DHJ (2016) Increasing delirium skills at the front door: results from a repeated survey on delirium knowledge and attitudes. *Age Ageing* 45(4):517–522. <https://doi.org/10.1093/ageing/afw066>
 27. Copeland C, Fisher J, Teodorczuk A (2018) Development of an international undergraduate curriculum for delirium using a modified delphi process. *Age Ageing* 47(1):131–137. <https://doi.org/10.1093/ageing/afx133>
 28. Detroyer E, Dobbels F, Debonnaire D, Irving K, Teodorczuk A, Fick DM et al (2016) The effect of an interactive delirium e-learning tool on healthcare workers' delirium recognition, knowledge and strain in caring for delirious patients: a pilot pre-test/post-test study. *BMC Med Educ* 16:17. <https://doi.org/10.1186/s12909-016-0537-0>
 29. National Institute for Health and Care Excellence. Delirium: prevention, diagnosis and management in hospital and long-term care. National Institute for Health and Care Excellence; 2010. <https://www.nice.org.uk/Guidance/CG103>. Accessed 2 Jul 2026.
 30. Scottish Intercollegiate Guidelines Network (SIGN). Risk reduction and management of delirium (SIGN publication no. 157); 2019. <http://www.sign.ac.uk>. Accessed 2 Jul 2026.
 31. National Institute for Health and Care Excellence. Dementia: assessment, management and support for people living with dementia and their carers; 2018. <https://www.nice.org.uk/guidance/ng97>. Accessed 2 Jul 2026.
 32. Parker C, Scott S, Geddes A (2019) Snowball sampling. SAGE Publications Ltd, London. <https://doi.org/10.4135/9781526421036831710>
 33. Kondracki NL, Wellman NS, Amundson DR (2002) Content analysis: review of methods and their applications in nutrition education. *J Nutr Educ Behav* 34(4):224–230. [https://doi.org/10.1016/S1499-4046\(06\)60097-3](https://doi.org/10.1016/S1499-4046(06)60097-3)
 34. Association of Medical Schools in Europe. Challenges of Doctor Mobility in a Changing Europe. Berlin; 2017. https://www.amse-med.eu/wp-content/uploads/2019/06/summary_amse_conference_2016.pdf. Accessed 8 Apr 2026.
 35. Sayek I, Turan S, Batu AH, Demirören M, Baykan Z (2021) Social accountability: a national framework for Turkish medical schools. *Med Teach* 43(2):223–231. <https://doi.org/10.1080/0142159X.2020.1841889>
 36. Tullo ES, Teodorczuk A, Brown S, Wakeling L, Khoo TK (2026) Embedding effective dementia education into undergraduate medical curricula—a realist review. *Age Ageing* 55(4):afag071. <https://doi.org/10.1093/ageing/afag071>
 37. Fisher JM, Gordon AL, MacLulich AMJ, Tullo E, Davis DHJ, Blundell A et al (2015) Towards an understanding of why undergraduate teaching about delirium does not guarantee gold-standard practice—results from a UK national survey. *Age Ageing* 44(1):166–170. <https://doi.org/10.1093/ageing/afu154>
 38. Muralidhar M, Delray S, Cooper C, Zabih S, Banerjee S, Giebel C et al (2025) Dementia education and training for the multidisciplinary student healthcare workforce: a systematic review. *Int J Geriatr Psychiatry* 40(7):e70119. <https://doi.org/10.1002/gps.70119>
 39. O'Sullivan T, Moore N, McVeigh J, Timmons Foley T (2024) “Understanding dementia together”: The design, delivery and evaluation of a collaborative, inter-professional dementia workshop for healthcare students. *Dementia* 24(4):720–37. <https://doi.org/10.1177/14713012241296173>
 40. Annear MJ, Goldberg LR, Lo A, Robinson A (2016) Interprofessional curriculum development achieves results: initial evidence from a dementia-care protocol. *J Interprof Care* 30(3):391–393. <https://doi.org/10.3109/13561820.2015.1117061>
 41. Davison E, Housden S, Lindqvist S (2019) Using interprofessional dementia learning opportunities to prepare the future healthcare workforce: findings from a pilot study. *J Interprof Care* 33(6):816–819. <https://doi.org/10.1080/13561820.2018.1551863>
 42. Scott TL, Kugelman M, Tulloch K (2019) How medical professional students view older people with dementia: implications for education and practice. *PLoS ONE* 14(11):e0225329. <https://doi.org/10.1371/journal.pone.0225329>
 43. Banerjee S, Jones C, Wright J, Grosvenor W, Hebditch M, Hughes L et al (2021) A comparative study of the effect of the Time for Dementia programme on medical students. *Int J Geriatr Psychiatry* 36(7):1011–1019. <https://doi.org/10.1002/gps.5532>
 44. Williams M, Daley S (2021) Innovation in dementia education within undergraduate healthcare programmes: a scoping review. *Nurse Educ Today* 98:104742. <https://doi.org/10.1016/j.nedt.2020.104742>
 45. Masud T, Ogliari G, Lunt E, Blundell A, Gordon AL, Roller-Wirnsberger R et al (2022) A scoping review of the changing landscape of geriatric medicine in undergraduate medical education: curricula, topics and teaching methods. *Eur Geriatr Med* 13(3):513–528. <https://doi.org/10.1007/s41999-021-00595-0>
 46. Pearson GME, Winter R, Blundell A, Masud T, Gough J, Gordon AL et al (2023) Updating the British geriatrics society recommended undergraduate curriculum in geriatric medicine: a curriculum mapping and nominal group technique study. *Age Ageing* 52(2):afac325. <https://doi.org/10.1093/ageing/afac325>
 47. von Streng Paats T, Masud T, Huwendiek S, Blundell A, Vassallo M, Stuck AE (2022) Geriatric medicine learning objectives and entrustable professional activities in undergraduate medical curricula: a scoping review. *Age Ageing* 51(5):afac100. <https://doi.org/10.1093/ageing/afac100>
 48. Department of Health Ireland. Appropriate prescribing of psychotropic medication for non-cognitive symptoms in people with dementia: NCEC National Clinical Guideline No. 21; 2019. <https://www.gov.ie/en/collection/c9fa9a-national-clinical-guidelines/>. Accessed 4 Mar 2026
 49. World Health Organization. Dementia: a public health priority; 2012. <https://www.who.int/publications-detail-redirect/dementia-a-public-health-priority>. Accessed 4 Mar 2026
 50. Fox S, Cahill S, McGowan R, Kilty C (2020). Young Onset Dementia: A Review of Diagnostic and Post-diagnostic Processes and Pathways. <https://dementia.ie/wp-content/uploads/2020/12/Youngonsetdementia.pdf>. Accessed 8 Apr 2026
 51. Anderson T, Coffey A, McMahon J, Craig S, Barry HE, Graham M et al (2025) Delirium education priorities for healthcare professional students: a modified Delphi study. *BMC Med Educ* 25(1):1126. <https://doi.org/10.1186/s12909-025-07667-w>
 52. Murad MH (2017) Clinical practice guidelines: a primer on development and dissemination. *Mayo Clin Proc* 92(3):423–433. <https://doi.org/10.1016/j.mayocp.2017.01.001>
 53. Institute of Medicine (2011). Clinical Practice Guidelines We Can Trust. <http://www.ncbi.nlm.nih.gov/books/NBK209539/>. Accessed 6 Mar 2026.
 54. Chaudhury H, Cooke HA, Cowie H, Razaghi L (2018) The influence of the physical environment on residents with dementia in long-term care settings: a review of the empirical literature. *Gerontologist* 58(5):e325–e337. <https://doi.org/10.1093/geront/gnw259>
 55. McCusker J, Cole M, Abrahamowicz M, Han L, Podoba JE, Raman-Haddad L (2001) Environmental risk factors for delirium in hospitalized older people. *J Am Geriatr Soc* 49(10):1327–1334. <https://doi.org/10.1046/j.1532-5415.2001.49260.x>

56. Quirke M, Bennett K, Chau HW, Preece T, Jamei E (2023) Environmental design for people living with dementia. *Encyclopedia* 3:1038–1057. <https://doi.org/10.3390/encyclopedia3030076>
57. Zeisel J, Bennett K, Fleming R (2020). World Alzheimer Report 2020: Design, dignity, dementia: Dementia-related design and the built environment. <https://www.alzint.org/resource/world-alzheimer-report-2020/>. Accessed 18 May 2026.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.