The impact of dementia education on student paramedics preparedness to care, knowledge, confidence, and attitudes towards dementia: an analytic survey

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Abstract

Background: Paramedics play a vital role in the emergency health care of people living with dementia. People with dementia often have complex needs, posing challenges for paramedics. Paramedics often lack the confidence and skills to assess people with dementia appropriately and receive little, if any, dementia education.

Aims: To evaluate the impact of dementia education on student paramedics preparedness to care, knowledge, confidence, and attitudes towards dementia.

Methods: A 6-hour education programme on dementia was developed, implemented, and evaluated. A pre-test-post-test design using self-completion validated questionnaires was used to evaluate first year undergraduate student paramedics knowledge, confidence, and attitudes, towards dementia, as well as their preparedness to care for people with dementia.

Results: Forty-three paramedic students attended the education programme with forty-one fully completed questionnaires being collected pre-training and thirty-two post-training. Students reported feeling significantly more preparedness to care for people with dementia after the education session ($p<0.001$). They felt their knowledge (100%), confidence (87.5%), and attitudes (87.5%) towards dementia had significantly increased following the education session. Using validated measures, the impact of education was found to be the highest on dementia knowledge (13.8 vs 17.5; $p<0.001$) and on confidence (29.14 vs 34.06; $p=0.001$), with only a minimal effect on attitudes (101.5 vs 103.4; $p=0.485$). The education programme itself was well-evaluated.

Conclusion: As paramedics are central to the emergency health care of people living with dementia, it is essential that the emerging paramedic workforce are equipped with the knowledge, attitudes, and confidence to provide quality care for this population. We need to ensure dementia education is embedded in undergraduate curricula and that consideration is given to the subjects, level and pedagogic approach taken to ensure positive outcomes are maximised.

Keywords: dementia; paramedics; students; education; preparedness, knowledge; confidence; attitude

Introduction

Dementia is a syndrome (a group of related symptoms) associated with an ongoing decline of brain functioning (NHS, 2020). It is estimated that approximately 55 million people live with dementia worldwide, with almost 10 million people developing dementia each year (World Health Organisation (WHO), 2021). People with dementia often have complex needs, and 77% of people with dementia have one or more comorbidities (Department of Health (DoH), 2019). Most commonly, these include strokes, diabetes, falls, and frailty. The rising demands on prehospital and emergency care, especially for those with dementia, are well documented (Marks et al, 2002; Voss, 2020); there were 379,004 emergency admissions for people with dementia in England in 2017-18, compared with 279,265 in 2012-13 (a rise of 35%) (Alzheimer's Society, 2020). People with dementia are more likely to be admitted to hospital (Shepherd et al, 2019), and once admitted, they have poorer outcomes, including a longer stay, higher rates of readmission, and higher mortality (Sampson et al, 2009). Paramedics are therefore central to the emergency health care of people living with dementia.

The growing prevalence of dementia demands care professionals with the knowledge, confidence, and attitudes to support people living with dementia and respond to their diverse needs. Ensuring health care professionals receive appropriate dementia education has been identified as a global concern (WHO, 2017). The WHO (2017, p23) global action plan on the public health response to dementia 2017-2025 set as a priority the need to "Build the knowledge and skills of general and specialized staff in the health workforce to deliver evidence-based, culturally-appropriate and human rights-oriented health and social care". Targets for educating healthcare staff in dementia care are included in the Prime Minister's Challenge on Dementia 2020 (DoH, 2015) advocating that all people living with dementia receive high-quality care. Dementia strategies with accompanying national education frameworks for all staff working in health and social care are present across the four nations of the UK (Skills for Health, 2018; Scottish Government, 2011; Health and Social Care Board, 2016; Care Council for Wales, 2016), created to ensure quality and consistency in dementia education and training.

Dementia Training Standards Framework for England (DTSF) (Skills for Health, 2018) is divided into three tiers of learning outcomes (LOs). Tier 1 refers to training all health and social care staff should receive; LOs within this tier underpin subject 1: dementia awareness. Tier 2 sets out basic skills and knowledge relevant to any staff who have regular contact or

provide direct care for people with dementia, such as paramedics. Tier 3 sets out advanced knowledge for leaders in the field of dementia care. The framework consists of 14 key subjects of dementia education which includes for example, subject 4: person-centred dementia care, subject 5: communication, interaction, and behaviour, and subject 14: leadership in transforming dementia care (for full list see: DTSF, Skills for Health, 2018). Despite these efforts to bring about an educated and skilled workforce, it is still evident many health and social care professionals have limited dementia-specific knowledge (Care Quality Commission, 2022), with education and training offered in the UK at Tier 2 still being relatively absent (Smith et al, 2019).

The association of Ambulance Chief executives introduced dementia care objectives for practising paramedics (2017), such as delivering person-centred care, recognising early signs of dementia, and developing inter-professional working partnerships to improve health and health outcomes for people with dementia. However, The College of Paramedics (CoP) curriculum for paramedics (CoP, 2019), as well as QAA subject benchmarks (QAA, 2019) for the education of degree qualified paramedics in the UK do not specifically detail the requirements for *dementia* education. Higher Education Institutions (HEI's) face challenges in integrating dementia education in a meaningful way; barriers include a lack of leadership, time, organisational and student buy-in, and a reliance on individual commitment to effect change (Feeney et al, 2021) and studies have demonstrated a lack of education on caring for older adults and people with dementia in undergraduate paramedic programmes (Annear et al, 2016). Educating undergraduate paramedic students about dementia is essential to help prepare them for work in the field. It is essential HEIs address this deficit by embedding dementia education in pre-registration programmes (Banerjee et al, 2017; Grosvenor et al., 2017; Choonara & Williams, 2021). This provision needs to be further evaluated to ensure the paramedic workforce are better prepared to care for people living with dementia.

This study aimed to investigate the impact a one-day dementia education programme had on undergraduate paramedic science students' knowledge, confidence, and attitudes toward dementia. We sought to provide further evidence on the effectiveness of dementia education programmes in helping to prepare paramedics to care for people with dementia.

Methods

Study design

A 6-hour dementia education programme was designed and delivered to student paramedics. A pre-test-post-test design using online self-completion validated questionnaires was used to evaluate student paramedics knowledge, confidence, and attitudes, towards dementia, as well as their preparedness to care for people with dementia. Ethical approval was granted by the Chair of the Humanities, Social and Health Sciences Research Ethics Panel at the participating University. Students were recruited by email and were sent the project information sheet and consent form two-weeks prior to their involvement in the study. Students were made aware that participation was voluntary, non-participation would not adversely affect their education and data would be anonymised and used in publications. Written consent was gained by all participating students. The questionnaire was distributed to all participants after consent was received and prior to them completing both the dementia education programme (T1) and immediately after the programme was completed (T2). The questionnaire closed two weeks after the delivery of the programme.

Population and Setting

The convenience sample consisted of first year baccalaureate students enrolled on the Paramedic Science programme at a university in the north-central part of England. The full cohort of forty-five student paramedics were invited to participate in the study. All students received the dementia education programme regardless of their participation in the study. There was no other inclusion or exclusion criteria.

Education programme

The 6-hour dementia education session included a mixture of didactic teaching, as well as collaborative and reflexive learning (Laal & Laal, 2012; Dyke, 2009). Education was delivered face-to-face and by a specialist dementia educator as recommended by Surr et al (2020). Table 1 identifies the programme's content as mapped against the Dementia Training Standard Framework (DTSF) (Skills for Health, 2018). Materials, including quizzes (subject 1 & 4, 1hr), experiential case studies (subjects 4,5 & 9, 2hrs), videos created with people living with dementia (subjects 2,4 & 5, 2hrs) and exercises (subjects 4 & 5, 1 hr) were co-designed by an experienced paramedic, a paramedic educator and the dementia educator. As a pre-requisite all students were asked to complete Health Education England's (HEE) online

eLearning for health (Dementia - eLearning for healthcare, HEE, 2022), Module 1: Introduction to living with dementia: dementia awareness (Tier 1, Subject 1 – DTSF).

Table 1: Education programme outline

DTSF Subjects covered	DTSF Learning outcomes covered		Tier
	HEE module	Education programme	
Subject 1: Dementia Awareness	●	●	1/2
Subject 2: Dementia identification, assessment, and diagnosis[1]		●	2
Subject 4: Person-centred dementia care		●	2
Subject 5: Communication, interaction, and behaviour in dementia care		●	2
Subject 9: Families and carers as partners in dementia care		●	2

Data Collection

The three validated tools used in the pre-test-post-test design were the Dementia Knowledge Assessment Tool -2 (DKAT2) (Toye et al., 2014), the Confidence in Dementia Scale (CODE) (Elvish et al., 2014), and the Dementia Attitudes Scale (DAS) (O'Connor & McFadden, 2010). These were distributed to student paramedics online (using online surveys) as a single self-administered questionnaire. These scales have been proven to demonstrate good psychometric properties and are suitable for use by professional caregivers (Gkioka et al, 2020). DKAT2 is a 21-item questionnaire with response options *yes, no* and *don't know.*

[1] Although the education session covered subject 2: dementia identification, some of the outcomes related to assessment and diagnosis were not covered, for example outcomes e and f were not covered. For more information about the LO associated with each subject please refer to the DTSF (Skills for Health, 2018).

Higher scores (ranging 0-21) denote better knowledge. CODE is a 9-item questionnaire scored on a five-point Likert scale with anchored ratings of *not confident* to *very confident.* The scores range from 9-45, with higher scores representing higher levels of confidence in working with people with dementia. DAS consists of 20 items scored on a 7-point Likert scale with responses ranging from *strongly disagree* to *strongly agree*. The total scores achievable for this scale range from 20 to 140, with a more positive attitude reflected by a higher score.

Basic demographic data of the participants collected at T1 consisted of age, gender, ethnicity, previous dementia education/training and the level of training intensity and prior caring responsibilities for someone with dementia. Participants were asked about their overall preparedness to care for people with dementia (T1/2). Open-ended questions were used to identify elements of good practice when caring for someone with dementia (T1/2) and evaluative questions about the programme and their learning (T2).

Data Analysis

We began with exploratory analyses including box plots that showed the relationship between T1 & T2 with three scores (DKAT2, CODE, DAS). We reported descriptive statistics depending on the measurement scale of variables: mean & standard deviations for ratio level data and number & percentages for categorical data. An appropriate statistical test was conducted according to the variable measurement scale. We used Chi-square test to find association of sex, age groups, ethnicity at pre- and post- education. We use the t-test to compare three scale (DKAT2, CODE and DAS scores) at pre- and post- education. All analyses were carried out using R (R Core Team (2020). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/). We followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for reporting observational studies (https://www.equator-network.org/reporting-guidelines/strobe/).

Results

The targeted population consisted of forty-five student paramedics. Forty-three (95.5%) attended the education programme, of which forty (88.8%) completed the pre-requisite e-learning module. Forty-one fully completed questionnaires were collected pre-education (T1)

(91.1% response rate). Only the forty-three students who attended were given the follow-up questionnaires and thirty-two completed responses were collected post-education (T2) (74.4% response rate).

Descriptive characteristics of respondents at T1 and T2

Seventy percent of participants were female (n=29 at T1, dropping to n=23 at T2), which is not representative of the current male-dominated workforce demographics (HCPC, 2021). At T2 only nine males participated (28.1%) and most students were between 18-35 years old (78.1%). Participants ethnicity was ninety percent white, which is representative of the paramedic workforce (HCPC, 2021). At T1 half of the students had previous experience of caring for a person with dementia, either caring for a relative or as part of prior healthcare employment. Only 3 students declared receiving *advanced* training covering subjects' *communication, interaction and behaviour in dementia care* and 1 student on *Health and well-being in dementia care*. Most students received basic, or intermediate levels of training and/or education on dementia related subjects, including ninety-two percent attending dementia awareness training at T1. Table 2 shows participants' demographic characteristics and background data at T1 and T2.

Table 2. Demographic and background data of participating student paramedics at T1 and T2

Demographic data	**Category**	**T1 N (%)**	**T2 N (%)**	**Chi-square test P-value**
N	-	41	32	-
Gender	Male	12 (29.3)	9 (28.1)	1.000
	Female	29 (70.7)	23 (71.9)	
Age (years)	18-24	21 (51.2)	10 (31.3)	0.368
	25-34	14 (34.1)	15 (46.9)	
	35-44	5 (12.2)	6 (18.8)	
	45-54	1 (2.4)	1 (3.1)	
	55<	0 (0)	0 (0)	
Ethnicity	White	37 (92.5)	29 (90.6)	1.000
	Asian	1 (2.5)	1 (3.1)	
	Other (Mixed)	2 (5)	2 (6.3)	
	Yes	11 (26.8)	26 (81.3)	<0.001

Preparedness to care – "Do you feel prepared to care for people with dementia?"	No	14 (34.1)	1 (3.1)	
	Not sure	16 (39)	8 (25)	
Prior training/education				
Dementia Awareness	None	3 (7.3)		
	Basic	23 (56.0)		
	Intermediate	15 (36.5)		
	Advanced	0 (0)		
Person-centred dementia care	None	7 (17.0)		
	Basic	19 (46.3)		
	Intermediate	15 (36.5)		
	Advanced	0 (0)		
Dementia and human-rights	None	7 (17.0)		
	Basic	22 (53.6)		
	Intermediate	12 (29.2)		
	Advanced	0 (0)		
Communication, interaction, and behaviour in dementia care	None	5 (12.1)		
	Basic	21 (51.2)		
	Intermediate	12 (29.2)		
	Advanced	3 (7.3)		
Health and well-being in dementia care	None	8 (19.5)		
	Basic	21 (51.2)		
	Intermediate	11 (26.8)		
	Advanced	1 (2.4)		
Prior experience of dementia	Yes	21 (51.2)		
	No	20 (48.8)		

Pre-post education programme analysis

Preparedness

At T1, Only 11 students (26.8%) said they felt prepared to care for people living with dementia, with 16 (39%) not sure and 14 (34.1%) stating they felt unprepared to care (see

Table 2). All the students who felt prepared to care had prior experience of caring for someone with dementia. Of the 14 who felt ill-prepared to care, the majority (n=13) had no prior caring experience. Students reported preparedness increased following the dementia education programme, with 26 (81.3%) declaring they felt prepared to care, with only 1 student not feeling prepared and 8 others (25%) not sure. One of the qualitative comments, about what makes students feel prepared/underprepared, suggested the education, as well as the associated dementia-focused assignment helped them to feel more prepared to care.

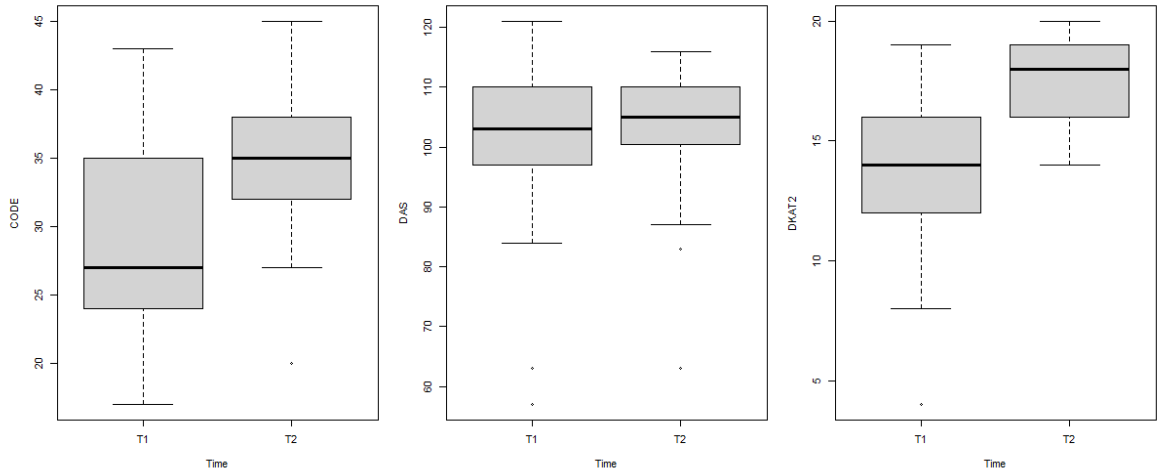
Knowledge, Confidence and Attitudes

Table 3 compares mean scores obtained by participating students in the DKAT2, CODE and DAS. It also includes the number of students who reported they felt their knowledge, confidence, and attitudes had increased post-education.

Table 3. Mean DKAT2, CODE and DAS at T1 and T2.

	Mean Scores ± SD		T-test P-value
Scales/sub-scales	T1 (N=41)	T2 (N=32)	T1 Vs T2
Dementia Knowledge Assessment Tool (DKAT2)	13.805 ± 3.19	17.469 ± 1.70	<0.001
Confidence in Dementia Scale (CODE)	29.14 ± 7.20	34.06 ± 5.30	0.001
Dementia attitude Scale (DAS)	101.46 ± 12.75	103.41 ± 10.87	0.485
Reported scores	Reported increase at T2, N (%)		
Knowledge		32 (100)	
Confidence		28 (87.5)	
Attitudes		28 (87.5)	

Figure 1: The comparison of three scales (CODE, DAS, DKAT2) at T1 & T2



Knowledge

All the participants reported they felt their knowledge of dementia had increased after attending the dementia education session (see table 3). The mean score at T1 was 13.805 (IQR 4-19) which increased to 17.469 (IQR 14-20) at T2. This showed a significant improvement in the overall knowledge scores ($p < 0.001$). There was a board pattern of increasing baselines scores associated with increasing levels of dementia-related exposure and prior education/training. The main improvements were made in areas of assessment and diagnosis, for example at T1 over half the students (n=21, 51.22%) didn't know blood vessel disease can cause dementia. This increased to 28 (87.50%) being aware of this cause. The area of least improvement was in the section on symptoms, especially related to confusion. At T1 30 students (73.17%) believed sudden increases of confusion are characteristic of dementia, this only reduced to 24 students at T2 (75%), with 3 still not certain.

Confidence

Eighty seven percent of students (n=28) reported they felt more confident about caring for someone with dementia because of attending the dementia education session (see table 3). Three students felt their confidence had not changed. The average confidence scores increased from 29.14 (IQR 17-43) at T1 to 34.06 (IQR 20-45) at T2 ($p = 0.001$). Confidence levels were high before the education programme, with even the most inexperienced students (with no prior employment or caring responsibilities and stating they had never met someone with dementia) feeling confident about caring for people with dementia. Two such students who scored the lowest on the DKAT2 at T1 (with knowledge scores of 4 and 8) had confidence scores of 25 and 30 respectively. Students at T1 were particularly confident at interacting with people with dementia who can communicate verbally, with 29 (70.7%)

stating they were able or very able. The biggest area of improvement in confidence was in students' abilities to identify when a person has dementia, with only 11 (26.8%) students feeling able or very able at T1, increasing to 21 (65.6%) students at T2.

Attitudes

Eighty seven percent of students (n=28) reported they felt their attitude towards people with dementia had improved following the education session. Two students felt their attitudes had not changed. However, there was not a significant increase in attitude scores. Average attitude scores at T1 were 101.46 (IRQ 57-121) and only rose to 103.41 (IQR 58-116) at T2 ($p = 0.485$). The biggest improvement came with students' familiarity with dementia; at T1 16 students (39%) agreed or strongly agreed they were not familiar with dementia compared with only 2 (6.3%) at T2. Students also felt less frustrated due to their lack of knowledge in how to care for people with dementia after the education session; 15 (36.5%) students agreed or strongly agreed to feeling frustrated prior to the training compared with only 2 (6.25%) at T2.

Evaluation of training

Almost ninety-six percent (n=31) of students felt the dementia education received would improve their practice as a paramedic (with just 1 student claiming not to be sure how it would affect their future practice). Students felt the education session was quite (43.8%) or very (50%) relevant to their role, easy (50%) or very easy (43.8) to understand, and they felt confident in their ability to put the learning into practice (93.8%). The qualitative comments indicated the strengths of the education were the "relevant case studies and discussion about them", the content regarding identifying different types of dementia and how these can affect individuals differently. Gaps included identifying learning strategies to '*deal with people if they become agitated'* and actual experience communicating with someone with dementia.

Discussion

The aim of the study was to develop, implement and evaluate a dementia education programme for first year pre-registration paramedic students. Students felt their knowledge, confidence, and attitudes towards dementia had significantly increased following the education session, and they felt significantly more prepared to care for people with dementia as a result. The impact of education collected from the validated measures was found to be the highest on dementia knowledge, specifically on topics related to identification and assessment of

dementia. Students' confidence towards dementia also increased, again especially related to their ability to identity when someone has dementia. Student's confidence and attitudes towards people with dementia were high prior to the education therefore there was only a small effect size noticed in student's attitudes. Even students who lacked knowledge were confident at caring for someone with dementia prior to the education. Student paramedic characteristics include extraversion and confidence, particularly in their ability to interact with patients (Holmes et al, 2017; Hallam et al, 2016) which may be indicative of the higher baseline scores, and possibly reflects methodological problem with self-reporting (Baxter & Norman, 2011).

A key area for educational enhancement to ensure more consistent increased knowledge is content related to acute confusion in dementia. Education on identification and management of delirium superimposed on dementia (DSD) is planned in Year 2, and its absence in the Year 1 programme resulted in the students continuing lack of knowledge in this domain. There is a high prevalence and detrimental impact of DSD (Han et al, 2022). As emergency medical service providers frequently encounter delirious patients, but do not know how to identify the condition or differentiate it from dementia, better education is needed to ensure paramedics can identify and manage acute confusion (LaMantia et al, 2017). Involving people living with dementia in education delivery may enhance the quality of the education, and indeed confidence and attitude levels. While co-design involving *experts by experience* is well identified (Goh et al, 2022), less attention has been paid to *co-delivery*. Including the direct voice and experiences of people living with dementia via direct involvement in delivery of education can lead to positive learner reactions and positive outcomes for learner confidence and self-efficacy (Baillie et al, 2016).

The education was designed to include Tier 2 learning outcomes covering 5 key subjects on DTSF (Skills for Care, 2018) which fills a gap in education/training delivery at this level (Smith et al, 2019). The education was well received with students considering it relevant to their role, easy to understand, and they felt confident in their ability to put the learning into practice. The key strengths of the education were the experiential case study materials and the content regarding identifying different types of dementia. The programme was delivered face-to-face and led by a specialist dementia educator, as recommended by Surr et al (2020). Further consideration should be given to pedagogical factors, using face-to-face learning in combination with simulation-based learning is most likely to have an impact on staff outcomes

(Parveen et al, 2021). Also, the inclusion of a placement (with mentoring) may enhance students' knowledge and attitudes towards dementia further (Banerjee et al, 2017).

There are significant barriers to CPD opportunities for registered and practising paramedics (Hobbs et al, 2021). It is therefore vital that dementia education is embedded in pre-registration curricula to ensure the emerging paramedic workforce is prepared to care for people with dementia. Educating undergraduate paramedic students about dementia is essential to help prepare them for work in the field (Banerjee et al, 2017; Choonara & Williams, 2021). This programme, and evaluation of it, addresses the dearth of education and research in this area and has concluded that a one-day tier 2 dementia education programme, with e-learning components, provided to year one pre-registration paramedics can enhance knowledge and preparedness to care for people with dementia, albeit further education should be continued throughout the full undergraduate curriculum.

Limitations

The limited sample size taken from a single site and from one cohort of students, as well as the lower response rate at T2 impedes the generalisability of the findings. The survey measures have previously been used within specific settings such as acute care. This may have had an impact on the results. Although there are good reported psychometric properties of the DKAT2 (Gkioka et al, 2020), the DKAS may be a more reliable and valid measure to use, assessing knowledge across a wider range of domains (Annear et al, 2017). Enhanced statistical analysis, identifying correlations between prior caring, training and experience and the knowledge, confidence and attitude measures may have enhanced the depth of the analysis. The sustainability of any effects of the education is unknown and to enhance this, follow-up outcome measures could be taken over the longer term (3+ months) post-education. Given the limitations of self-reported measures (Baxter & Norman, 2011), consideration should be given to using observational methods to report on behaviour change. Conducting further evaluative work after amending the curriculum to incorporate other teaching methods (such as simulation), including people with dementia in the delivery of the education, and including topics on delirium would help to assess the quality of the approaches to education.

Conclusion

As paramedics are central to the emergency health care of people living with dementia, it is essential that the emerging paramedic workforce are equipped with the knowledge, attitudes,

and confidence to provide quality care for this population. We need to ensure dementia education is embedded in undergraduate curricula and consideration is given to the subjects, level and pedagogic approach taken to ensure positive outcomes are maximised.

Author Contributions

Author 1 is a dementia educator, designed and delivered the dementia education, created the surveys, analysed the data and led write-up. Author 2 contributed to write-up. Author 3 led the statistical analysis. Author 4 is a paramedic educator and received funding from the College of Paramedics to conduct the study and was involved in student recruitment. All authors contributed to the final draft of the manuscript.

Conflict of interest

None

Ethics

Ethics approval has been granted by the Chair of the Humanities, Social and Health Sciences Research Ethics Panel at the University of Bradford on 16/11/21.

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