A comparative study of dementia knowledge, attitudes and care approach among Chinese nursing and medical students

Yao Wang (✉ sweet0131@163.com )
   Central South University Xiangya School of Medicine   https://orcid.org/0000-0001-9435-9599

Lily Dongxia Xiao
   Flinders University College of Nursing and Health Science

Rong Huang
   Central South University Xiangya School of Nursing

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Research article

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Abstract

Background

Dementia care requires inter-disciplinary collaboration starting from formal health professional education. Yet, little is known about how undergraduate medical and nursing students perceive dementia care in China. The aim of this study was to investigate undergraduate medical and nursing students’ knowledge, attitudes and care approach of dementia in China.

Methods

A cross-sectional survey was conducted. Students enrolled in a 5-year Bachelor of Medicine Program and a 4-year Bachelor of Nursing Program from four universities with campuses across Eastern, Western, Southern and Northern China were recruited into the study. Three validated instruments, Alzheimer's Disease Knowledge Scale, the Dementia Care Attitude Scale and Approach to Advanced Dementia Care Questionnaire, were used to measure students’ dementia knowledge, attitudes and perceived care approach. Data were collected using a self-administered survey.

Results

The number of medical and nursing students completing the survey was 526 and 467 respectively. Overall dementia knowledge was poor (19.49±2.82), but attitudes were generally positive (29.92±3.35). Medical students demonstrated higher dementia knowledge scores and showed less positive attitude scores than nursing students (p<0.05). We also observed that students would not apply a person-centered care approach. Findings also revealed statistically significant differences in care approach scores between medical and nursing students.

Conclusions

Study results highlight the urgent need to implement an inter-disciplinary approach to increasing dementia education among Chinese medical and nursing students, and ensuring that students have adequate knowledge, attitudes and experience in the care of people with dementia.

Background

There are more than 50 million of people living with dementia across the world and this number is expected to rise rapidly to over 152 million by 2050 [1]. The total global estimated cost for dementia in 2015 was $957.56 billion USD and dementia is expected to cost $2.54 trillion USD in 2030 [2, 3]. China has the largest population of people with dementia in the world [1]. The population of people with dementia in China is expected to rise dramatically from 9.5 million in 2016 to over 16 million by 2030 [3]. The average cost per person with dementia per year is $19,144 USD, which is far exceeded average per capita disposable income in China [4].
There is an urgent need to improve the healthcare for people living with dementia around the world now and in the future. Although dementia cannot be cured, people living with dementia can live well, delay disease progression and achieve health–related quality of life when they receive a timely diagnosis, effective treatment and high-quality care [5]. However, more than 50% of people living with dementia in developed countries are under-detected and under-diagnosed [3]. In developing countries, including China, the diagnosis rate is only 5-10% [3, 6]. Even when people with dementia receive a diagnosis, the care provided is often uncoordinated, fragmented and unresponsive to individual needs [3, 7].

High-quality dementia care requires an inter-disciplinary collaboration in order to address individual care needs associated with the condition and other comorbidities [5, 8]. Health professionals, such as registered nurses, physicians, general practitioners, neuropsychologists and geriatricians, need to work collaboratively to contribute their specialist knowledge to the diagnosis, treatment, care and palliation for people living with dementia [5, 9]. To provide best-practice dementia care, health professionals also need to engage in shared decision-making to complement their roles and foster client-centered treatment and care [8, 10]. However, numerous studies have found that many health professionals lack knowledge of risk factors, symptoms, treatment, management and care approach for dementia [11-13]. Health professionals also demonstrate inappropriate attitudes towards dementia [12, 14]. For example, in a recent cross-sectional study involving 450 community health professionals in China, around 60% of participants showed negative attitudes towards the role of the primary care team in the care of people with dementia [12]. Poor knowledge and inappropriate attitudes were major barriers to establishing and maintaining successful collaborations in inter-disciplinary care teams [15].

Undergraduate medical and nursing programs, as the major providers of education for health professionals, play a crucial role in the provision of dementia education to healthcare workforce [16, 17]. Yet, the lack of dementia education in undergraduate curricula appears to be an international issue [18]. In Australia, dementia education is not included into the education curricula of 14 medical specialties [19]. In the USA, over half of health professionals feel that they are not equipped with adequate education and resources to manage people with dementia as their condition progresses [20]. Although the curricula of medicine and nursing undergraduate programs in China undergoes rigorous design, there is also no standard requirement for embedded or stand-alone topics specifically focusing on dementia [13]. Based on the first author’s academic experience, the study of dementia care is only 2 hours and 3 hours in the nursing and medical curriculum respectively at XX (blinded for review) University, one of the participating universities in this study. Often dementia education is delivered as a ‘tick-box’ exercise or an add-on, or there is an ad hoc approach. This kind of education has little value attached and does not positively impact on students’ knowledge, attitudes and skills in providing effective care for people with dementia [16].

In recent years, globally some efforts have been made to redress the lack of dementia education for undergraduate medical and nursing students. The Higher Education Dementia Network (HEDN) in UK has developed dementia core skills education and training framework for undergraduate programs [21]. The Health and Social Care Board in Northern Ireland recently designed a Dementia Learning and
Development Framework to facilitate development and provision of dementia education programs [21]. These initiatives are useful for supporting the development of dementia education in undergraduate programs. However, inter-disciplinary dementia education remains brief and inadequate. The content, implementation and assessment of inter-disciplinary dementia education remain inherently challenging. Identifying the current knowledge, attitudes and care approach of students from different disciplines is seen as a key component for the development of improved inter-disciplinary dementia education.

To meet recommended clinical practice guidelines for inter-professional dementia care [8, 10], it is imperative to evaluate undergraduate medical and nursing students’ dementia knowledge, attitudes and care approach to provide evidence to inform reforms to inter-disciplinary dementia education undergraduate programs. However, most survey studies that assessed students’ dementia knowledge, attitudes and care approach were conducted in developed countries [22, 23]. Little is known about undergraduate medical and nursing students’ perceived dementia knowledge, attitudes and care approach in developing countries including China. This paper reports on a study that addresses this gap in research by examining and comparing the dementia knowledge, attitudes and care approach of medical and nursing students at four universities located in different regions of China.

Methods

Aims

The aims of this study were to measure medical and nursing students’ dementia knowledge, attitudes and perceived care approach, and explore associated factors to inform inter-disciplinary dementia education curriculum design in China.

Study design

A cross-sectional study design was applied to achieve the aims of the study. A self-administered paper-based questionnaire survey was completed by medical and nursing students. This study design allowed anonymity in data collection and enabled students to respond without influence.

Setting and Participants

The study was undertaken in four universities with campuses across Eastern, Western, Southern and Northern China. All students enrolled in a 5-year Bachelor of Medicine Program and a 4-year Bachelor of Nursing Program were invited to participate in the study.

Measurements

The students’ demographic information included age, gender, academic year, informal caregiving experience for people with dementia, clinical practicum experience in geriatrics, dementia education or training experience and interest in learning more about dementia was collected.
The Alzheimer's Disease Knowledge Scale (ADKS) contains 30 true/false items to assess knowledge about dementia. The higher the score, the greater dementia knowledge. The Chinese version of the ADKS has adequate internal consistency with a Cronbach's alpha coefficient of 0.72[24].

The Dementia Care Attitude Scale (DCAS) consists of 8 items that measure students’ attitudes towards dementia. The instrument includes two factors (labeled as ‘Heartfelt’ and ‘Heartsink’) that use a 5-point Likert scale (1=strongly disagree to 5=strongly agree). The items of Heartsink factor are negatively worded and are reversed in a definite order when calculate the total score. The minimum score value for the total score is 8 and the maximum score value is 40. The internal consistency reliability of the Chinese version DCAS is 0.71[24].

The Approach to Advanced Dementia Care Questionnaire (ADCQ) was used to evaluate students’ care approach for people with dementia. The choice of answers indicates either a person-centred approach or a reality-oriented approach. Person-centred approaches are scored 1, and reality-oriented approaches are scored 0. A maximum score of 13 is possible. The psychometric properties of the Chinese version of the ADCQ have been established [11].

Data collection

The data collection was undertaken from January to May 2018. Two trained research assistants were responsible for participant recruitment and questionnaire distribution at each campus. All students were informed about the study via written information. Returning completed questionnaire survey was the evidence that students consented to participate in the study, so no consent form was required. Completion of the questionnaire took about 25 minutes. Students were requested to complete questionnaire independently and anonymously. To guarantee the anonymity and confidentiality, students submitted the completed questionnaire in a closed envelope and put it inside a closed box. Ethical approval for the study was gained from Human Research Ethics Committee of Xiangya School of Nursing, Central South University [study number 2017011].

Statistical analysis

The SPSS 22.0 statistical package was used for data analysis. Two research assistants checked the surveys for any missing data and entered the data into SPSS for analysis. The Kolmogorov-Smirnov test was used to determine normality of distribution of all variables. The ADKS, DCAS and ADCQ scores showed normality of distribution. An independent-sample t test, one-way ANOVA and Pearson correlation analysis were used to compare mean scores among groups. Multivariate analysis of variance (MANOVA) was used to compare scores in each content domain and total scores between medical and nursing students. Bonferroni correction was used to adjust the alpha level used to judge statistical significance. Multivariate regression models were used to identify predictors (independent variables) of ADKS, DCAS and ADCQ scores (dependent variables). Potential factors affecting ADKS, DCAS and ADCQ scores identified in the literature and in the bivariate analysis were entered as independent variables in three separate multivariate regression models. Preliminary analysis was conducted to ensure no violation of
the assumptions of normality, linearity, multi collinearity and homoscedasticity were present in the multivariate regression analysis. Statistical significance was set at p-value<0.05 in 2-tailed tests.

Results

Demographics of medical and nursing students

Of the 1200 questionnaires distributed, 85% (n=1020) were returned. Data from participants with more than 10% missing responses were excluded (n=27); the remaining 993 completed questionnaires yielded a response rate of 82.3%. The mean age of the sample was 19.9±1.8 years (range: 16-25 years). Most were female (74.4%), without informal caregiving experience for people with dementia (82.1%) and had interest in learning more about dementia (85.5%). A higher proportion of nursing students had geriatric clinical practice experience and dementia education or training than medical students (p<0.05). The demographics of medical and nursing students are summarized in Table 1.

Knowledge

The overall mean knowledge score was 19.49±2.82 (ranging from 10 to 30 out of 30) and equivalent to 65% of answers correct. Medical students demonstrated higher mean scores in the ‘symptoms’ and ‘life impact’ content domains than nursing students (p<0.05). The lowest overall scores were achieved on the ‘symptoms’ content domain (53%). From analyzing the four items of ‘symptoms’, a majority of students (72.3% n=718) mistakenly believed that ‘tremor or shaking of the hands or arms was a common symptom in people with Alzheimer’s disease’. In addition, only 27.8% (n=276) of students responded correctly to the item that ‘in rare cases, people have recovered from Alzheimer’s disease’ and 31% (n=308) gave the correct answer to the item that ‘if trouble with memory and confused thinking appears suddenly, it is likely due to Alzheimer’s disease’. Higher correct rates were obtained in the content domains of ‘treatment and management’ (72%) and ‘life impact’ (74%). Most students knew that ‘people whose Alzheimer’s disease was not yet severe could benefit from psychotherapy for depression and anxiety’. In the ‘life impact’ domain, most students knew the statement ‘it was safe for people with Alzheimer’s disease to drive, as long as they had a companion in the car at all times’ was wrong. Moreover, in the ‘course of disease’ domain, most students knew that ‘a person with Alzheimer’s disease became increasing likely to fall down as the disease got worse’ (Table 2).

Informal caregiving experience for people with dementia was not found to be significantly related to knowledge scores (p>0.05). Knowledge scores were significantly different when related to gender, academic year, clinical practicum experience in geriatrics, dementia education or training, and interest in learning more about dementia (p<0.05). In particular, students in year three had the highest knowledge scores.

Attitudes
Table 3 shows the total mean attitude score (mean=29.92, SD=3.35) and the mean scores of two factors ('heartfelt' and 'heartsink'). There were statistically significant differences in the total mean attitudes score (F=18.235, p<0.01) and mean score of the 'heartfelt' factor (F=7.409, p<0.01) between nursing and medical students. In the 'heartfelt' factor, most students agreed that 'much could be done to improve the quality of life of people with dementia' (mean=4.33, SD=0.63) and caregivers of people with dementia' (mean=4.20, SD=0.72). In the 'heartsink' factor, most students disagreed that 'patients with dementia could be a drain on resources with little positive outcome'. However, lowest scores were achieved in the items ‘the primary care team had a limited role to play in the care of people with dementia’ (mean=2.34, SD=0.87) and ‘managing dementia was more often frustrating than rewarding’ (mean=3.52, SD=0.99).

In addition, students who were female, had dementia education or training, and showed interest in learning more about dementia showed statistically significant higher attitudes scores (p<0.05). There were statistically significant decreases in attitudes scores between students in year 1 and other academic years (p<0.05).

**Care approach**

The total mean score of care approach was 5.42±2.20, indicating most students would not apply a person-centered approach in dementia care. Over 85% (n=848) of students realized that people with dementia should be allowed to freely express themselves even in seemingly meaningless behavior. However, more than 88% of students thought that when people with dementia participated in group activities they should be told what to do and that the aim of communicating should be to help them to better handle their life situation. Moreover, in all content domains a student’s major was not related to their dementia care approach (Table 4). There were no statistically significant differences in care approach scores between student groups.

**Predictors of knowledge, attitudes and care approach**

The results revealed that gender, major, clinical practicum experience in geriatrics, dementia education or training, and interest in learning more about dementia were predictors of dementia knowledge (F=6.614, P=0.000), explaining 5% of the variance in knowledge. The multiple regression model using attitudes as the dependent variable was statistically significant and three factors were identified to be associated with attitudes (F=10.956, P=0.000), explaining 7% of the variance. These factors were gender, dementia education or training, and interest in learning more. Moreover, only gender and interest in learning more about dementia were predictors of the care approach (F=2.234, P=0.023), accounting for 1% of the total variance (Table 5).

Table 1 Demographics of medical and nursing students and relationship the ADKS, DCAS and ADCQ
| Variables | The total=993 | Medical students=526 (53.0%) | Nursing students=467 (47.0%) | ADKS Mean( SD) | p-value | DCAS Mean( SD) | p-value | ADCQ Mean( SD) | p-value |
|-----------|--------------|-------------------------------|-------------------------------|----------------|----------|----------------|----------|----------------|----------|
| Age: Mean( SD) | 19.9(1.8) | 20.21(1.98) | 19.55(1.50) | --- | 0.939<sup>c</sup> | --- | 0.000*<sup>c</sup> | --- | 0.765<sup>c</sup> |
| Gender: n(%) | 0.034*<sup>d</sup> | 0.000*<sup>d</sup> | 0.018*<sup>d</sup> | 0.009*<sup>e</sup> | 0.002*<sup>e</sup> | 0.232<sup>e</sup> |
| Female | 739(74.4) | 310(58.9) | 429(91.9) | 19.6(2.8) | 30.3(3.2) | 5.3(2.2) |
| Male | 254(25.6) | 216(41.1) | 38(8.1) | 19.2(2.9) | 29.0(3.6) | 5.7(2.3) |
| Academic year: n(%) | 0.209<sup>d</sup> | 0.273<sup>d</sup> | 0.064<sup>d</sup> | 0.209<sup>d</sup> | 0.273<sup>d</sup> | 0.064<sup>d</sup> |
| Year 1 | 250(25.2) | 123(23.4) | 127(27.2) | 19.2(2.7) | 30.4(3.1) | 5.5(2.4) |
| Year 2 | 234(23.6) | 112(21.3) | 122(26.1) | 19.4(2.5) | 30.1(3.4) | 5.4(2.1) |
| Year 3 | 223(22.5) | 107(20.3) | 116(24.8) | 20.1(2.9) | 29.9(3.2) | 5.1(2.2) |
| Year 4 | 195(19.6) | 93(17.7) | 102(21.8) | 19.2(3.2) | 29.4(3.8) | 5.6(1.9) |
| Year 5 | 91(9.2) | 91(17.3) | 19.5(2.8) | 29.2(3.0) | 5.4(2.5) |
| Informal caregiving experience for people with dementia: n(%) | 0.209<sup>d</sup> | 0.273<sup>d</sup> | 0.064<sup>d</sup> | 0.209<sup>d</sup> | 0.273<sup>d</sup> | 0.064<sup>d</sup> |
| Yes | 178(17.9) | 88(16.7) | 90(19.3) | 19.3(3.0) | 29.7(3.4) | 5.7(2.2) |
|                  | n  | (%)  | Mean | SD  |
|------------------|----|------|------|-----|
| No               | 815| (82.1)| 19.6 | 30.0| 5.4 |
| Yes              | 101| (10.2)| 19.6 | 29.6| 5.7 |
| No               | 892| (89.8)| 18.8 | 30.0| 5.4 |
| Yes              | 206| (20.7)| 20.0 | 30.6| 5.4 |
| No               | 787| (79.3)| 19.4 | 29.8| 5.4 |
| Yes              | 849| (85.5)| 19.6 | 30.1| 5.4 |
| No               | 144| (14.5)| 18.7 | 28.8| 5.8 |

|                      | n  | (%)  | Mean | SD  |
|----------------------|----|------|------|-----|
| Clinica l practic um experience in geriatrics: n(%) |       |      |      |     |
| Yes                  | 101| (10.2)| 19.6 | 29.6| 5.7 |
| No                   | 892| (89.8)| 18.8 | 30.0| 5.4 |

SD, standard deviation

A higher proportion of nursing students had clinical practicum experience in geriatrics than the medical students (t=-2.000; p=0.046).
A higher proportion of nursing students had dementia education or training than the medical students ($t=-2.772; p=0.006$).

Statistic was based on independent-samples t test.

Statistic was based on Pearson correlation analysis.

Statistic was based on ANOVA.

*p<0.05.

Table 2 Scores of content domains of ADKS and student groups
| Student groups          | Mean±S D | %Correct | Mean±S D | Mean±S D | F value | p-value |
|------------------------|---------|----------|---------|---------|---------|---------|
|                        |         |          | Medical (n=526) | Nursing (n=467) |         |         |
| **#items**              |         |          |         |         |         |         |
| ADKS                   | 30      | 19.49±2.82 | 65%    | 19.71±2.86 | 19.25±2.76 | 6.574 | 0.010*  |
| Risk Factor            | 6       | 4.09±1.08 | 68%    | 4.09±1.06 | 4.09±1.10 | 0.002 | 0.968   |
| Symptoms               | 4       | 2.11±0.97 | 53%    | 2.20±1.00 | 2.00±0.93 | 9.933 | 0.002*  |
| Disease progression    | 4       | 2.46±0.93 | 61%    | 2.48±0.95 | 2.43±0.90 | 0.724 | 0.395   |
| Assessment and Diagnosis | 4     | 2.64±0.81 | 66%    | 2.67±0.80 | 2.60±0.83 | 1.923 | 0.166   |
| Treatment and Management | 4   | 2.89±0.80 | 72%    | 2.89±0.80 | 2.88±0.81 | 6.574 | 0.793   |
| Life Impact            | 3       | 2.23±0.72 | 74%    | 2.30±0.72 | 2.15±0.71 | 10.604 | 0.001*  |
| Care Giving            | 5       | 3.08±1.09 | 62%    | 3.08±1.08 | 3.09±1.10 | 0.054 | 0.817   |

The total score range was 0-30 with higher scores indicating better knowledge.

p-value was based on Multivariate analysis of variance (MANOVA).

Bonferroni correction for multiple comparisons was applied. With 8 group comparisons conducted, a corrected p-value of 0.0062 was required.

*Significant after Bonferroni correction (p-value <0.0062).
Table 3 Scores of subscales of DCAS and student groups

| Variables  | Medical (n=526) | Nursing (n=467) | #items | Mean±SD     | Mean±SD     | Mean±SD     | F value | p-value |
|------------|-----------------|-----------------|--------|-------------|-------------|-------------|---------|---------|
| DCAS       |                 |                 | 8      | 29.92±3.35  | 29.50±3.34  | 30.40±3.29  | 18.235  | 0.000*  |
| Heartfelt  |                 |                 | 4      | 16.23±2.01  | 16.07±2.07  | 16.41±1.93  | 7.409   | 0.007*  |
| Heartsink  |                 |                 | 4      | 13.44±2.49  | 13.42±2.42  | 13.47±2.56  | 0.103   | 0.749   |

Items of the DCAS were rated on a 5-point Likert scale with higher scores indicating better attitudes.

p-value was based on Multivariate analysis of variance (MANOVA).

Bonferroni correction for multiple comparisons was applied. With 3 group comparisons conducted, a corrected p-value of 0.0167 was required.

*Significant after Bonferroni correction (p-value <0.0167).

Table 4 Scores of content domains of ADCQ and student groups
### Table 5 Factors associated with the ADKS, DCAS and ADCQ identified in three multiple regression models

| Major Variables | Medical (n=526) | Nursing (n=467) |  |  |
|------------------|----------------|----------------|---|---|
|                  | #items | Mean±SD | Mean±SD | Mean±SD | F value | p-value |
| ADCQ             | 13     | 5.42±2.20 | 5.43±2.35 | 5.41±2.04 | 0.012 | 0.912 |
| Orientation of time, place and situation | 3 | 1.03±0.81 | 1.04±0.84 | 1.02±0.76 | 0.270 | 0.604 |
| Correction of behavior | 3 | 1.46±0.75 | 1.47±0.80 | 1.46±0.69 | 0.017 | 0.895 |
| Emphasis on the past or the present | 3 | 1.33±1.01 | 1.31±1.02 | 1.35±1.01 | 0.479 | 0.489 |
| Aim of the nurses' communication | 3 | 0.82±0.73 | 0.84±0.77 | 0.79±0.69 | 1.551 | 0.213 |
| Whether confusion had any meaning for the patient | 1 | 0.78±0.41 | 0.77±0.42 | 0.80±0.40 | 1.372 | 0.242 |

The person-centred approach answer earned a score of 1 point, whereas the reality-oriented answer earned no points. The total score range was 0-13.

p-value was based on Multivariate analysis of variance (MANOVA).

Bonferroni correction for multiple comparisons was applied. With 6 group comparisons conducted, a corrected p-value of 0.0083 was required.

Table 5 Factors associated with the ADKS, DCAS and ADCQ identified in three multiple regression models
| Variables | ADKS | DCAS | ADCQ |
|-----------|------|------|------|
|           | B(SE) | 95% CI | p-value | B(SE) | 95% CI | p-value | B(SE) | 95% CI | p-value |
| Age(years) | -0.14 (0.11) | -0.35 to -0.07 | 0.19 | 0.19 | -0.15 (0.13) | -0.39 to -0.10 | 0.25 | 0.04 (0.09) | -0.20 to -0.13 | 0.68 |
| Gender(male=1) | 0.67 (0.22) | 0.23 to 1.09 | 0.00 | 0.00 | 0.99 (0.26) | 0.49 to 1.49 | 0.00 | -0.42 (0.18) | -0.76 to -0.07 | 0.01 |
| Major(nursing =1) | 0.67 (0.20) | 0.29 to 1.05 | 0.00 | 0.00 | -0.39 (0.23) | -0.83 to -0.05 | 0.09 | -0.09 (0.16) | -0.39 to -0.21 | 0.56 |
| Year of education(year 1=1) | 0.21 (0.15) | 0.09 to 0.50 | 0.17 | 0.17 | -0.16 (0.18) | -0.50 to -0.19 | 0.36 | 0.01 (0.12) | -0.22 to 0.25 | 0.90 |
| Informal care giving experience for people with dementia (yes =1) | 0.18 (0.23) | -0.27 to 0.63 | 0.44 | 0.44 | 0.28 (0.27) | -0.25 to 0.80 | 0.30 | -0.29 (0.19) | -0.65 to 0.07 | 0.11 |
| Clinical practicum experience in geriatrics (yes =1) | 1.08 (0.33) | 0.44 to 1.72 | 0.00 | 0.00 | 0.33 (0.38) | -0.43 to 1.06 | 0.39 | -0.36 (0.26) | -0.86 to 0.16 | 0.17 |
| Dementia education | -0.91 (0.24) | -1.40 to -0.46 | 0.00 | 0.00 | -1.10 (0.28) | -1.60 to -0.51 | 0.00 | 0.22 (0.19) | -0.16 to 0.57 | 0.24 |
or training (yes =1)

| Interest in learning more about dementia (yes =1) | Adjusted R², p-value | B, unstandardized coefficients | SE, Std. error of B | β, standardized coefficients |
|-------------------------------------------------|----------------------|-------------------------------|-------------------|-----------------------------|
| 0.84(0.26) | 0.34-1.34 | 0.00 | 1* | 1.24(0.30) | 0.65-1.82 | 0.00 | 0* | -0.43(0.20) | -0.83-1.03 | 0.03 | 3* |

B, unstandardized coefficients
SE, Std. error of B
β, standardized coefficients
*p<0.05

Discussion

A body of evidence confirms that the most effective dementia care is provided by health professionals through inter-professional collaboration [25-27]. However, few inter-disciplinary studies comparing knowledge, attitudes and care approach of dementia are available. In this study, self-reported knowledge, attitudes and care approach of dementia among medical and nursing students were explored to determine whether students were well prepared with core dementia care competence during their formal education years. The present study is significant in contributing to a broader understanding of the topic, providing insight into current inter-disciplinary curriculum reform of medicine and nursing undergraduate programs, and may be used to improve preparation of the future health workforce.

This study found that the knowledge scores of nursing and medical students in China are significantly less than their counterparts in Malta and US respectively [23, 28]. Possible reasons for this difference may be that there are more dementia education and training activities in medicine and nursing bachelor programs in developed countries. In China, education sessions in gerontology for undergraduate medical and nursing students are generally covered during the third year with our results suggesting that such
education has a positive influence on students’ knowledge [29]. A study by A Scerri and C Scerri [23] also found that education sessions had a positive influence on students’ knowledge about dementia. However, it should be noted that knowledge of dementia decreases after students’ clinical placements. This suggests that theory-based ‘gerontology’ classroom study alone is insufficient and students need to be better supported to apply theory to practice [29]. The lack of suitable clinical placements for medical and nursing students is one important barrier to dementia care education [10, 22]. Strategies used to support clinical preceptors to develop dementia care competence need to be considered in the Chinese context. Clinical preceptors have a responsibility to provide a supportive clinical learning environment and involve students in a team approach to improve their care practices. Effective teaching strategies, learning resources and meaningful feedback are also vitally important to improve students’ knowledge of dementia care.

The data presented here is also indicative of the lack of knowledge about dementia symptoms (correct rate 53%) and care giving issues (correct rate 62%). A similar finding was recently observed among Chinese primary health care professionals [30]. Moreover, in a survey involving 280 nursing students, questions on dementia care giving had a similar correct rate (65%) [23]. More education and training is needed to increase knowledge about dementia care giving, especially person-centered care, which is internationally recognized as best-practice. This present study also identified that nursing students have less knowledge about dementia symptoms and life impact compared to medical students. Yet, nurses are in an ideal position to coordinate early detection and dementia management as they constitute the majority of health professionals and have more contact and closer relationships with health service recipients. A limited knowledge of symptoms and life impact among nursing students will limit their professional roles in providing dementia care services upon graduation.

Overall, medical and nursing students expressed moderately positive attitudes towards people with dementia and their family caregivers. This result is consistent with a previous study which showed nursing students demonstrate more positive attitudes scores than medical students [23]. However, nursing students in our study had a low score in person-centered dementia care. These results confirm findings from previous studies in China [11, 30] and may indicate that person-centered dementia care is not well known in China. Much work needs to be done throughout China to promote the person-centered care approach as the gold standard in dementia care and to integrate this into government policies, dementia care guidelines, curricula of health professional education and clinical practice [11, 31]. It is recommended that person-centered care education be fostered by creative, experimental and reflective processes [32]. Educators need to facilitate students’ learning of dementia care by creating respectful dialogue through critical thinking, self-awareness, personal knowing and reflection using case scenarios.

The present study identified that clinical practicum experience in geriatrics, dementia education and training, and interest in learning dementia care were predictors of better knowledge, attitudes and care approach. This finding supports previous studies in developed countries [23, 33, 34]. University academics, physicians, registered nurses and clinical preceptors need to work closely to involve students in dementia care to produce a better qualified healthcare workforce. The dementia care curricula need to
address the full range of appropriate knowledge and skills, and to be embedded across topics. For example, ethics, communication, evidence-based science and psychology topics [16]. One-off and short-term sessions, lectures or assessments that have few activities to engage students have limitations in improving students’ dementia knowledge, attitudes and care approach. Moreover, collaborative practice and teamwork among medical and nursing students are core to developing their competence in interdisciplinary dementia care and need to be incorporated in practicum topics throughout the medical and nursing curricula in undergraduate programs [8, 35].

**Strengths and limitations of the study**

To our knowledge, this study is the first to evaluate dementia knowledge, attitudes and care approach among undergraduate medical and nursing students in China. The main strengths of the present study are the participation of four universities and the large sample size, allowing a fairly good generalizability and representativeness of the findings. The high response rate also represents students’ interest in dementia. There are several limitations to this study that should be considered. As with cross-sectional design, data are collected only once over a relative short period of time, limiting the ability to draw conclusions of possible causal relationships. Scores from self-report measures can be influenced by social desirability bias. Therefore, attitudes scores should be interpreted cautiously. In any future study, the multivariate regression models should be improved to better explain variance.

**Conclusion**

The present study identified that medical students enrolled in a 5-year undergraduate program and nursing students enrolled in a 4-year undergraduate program in China demonstrate low scores for dementia knowledge and person-centered care approach, while showing moderately positive attitudes towards dementia. The results suggest that a curriculum intervention to strengthen dementia education among medical and nursing students is imperative considering the rapidly ageing population and demand for high-quality care for people with dementia. Comprehensive undergraduate dementia education and effective teaching strategies will support students as they begin their career trajectories and will ultimately improve health outcomes of people with dementia. This study provides further evidence to support development of more comprehensive, evidence-based inter-disciplinary dementia undergraduate education programs.

**Abbreviations**

USD, USA Dollar; HEDN, Higher Education Dementia Network; ADKS, Alzheimer’s Disease Knowledge Scale; DCAS, Dementia Care Attitude Scale; ADCQ, Approach to Advanced Dementia Care Questionnaire.

**Declarations**

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**Author’s contributions**

LDX, YW, RH designed the study. YW, RH carried out most of the data collection. YW undertook most of the data analysis and wrote the first draft of this paper. All authors contributed to data analysis, interpretation, critically commented and approved the final manuscript.

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**Availability of data and material**

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

**Ethics approval and consent to participate**

Ethical approval for the study was gained from Human Research Ethics Committee of Xiangya School of Nursing, Central South University [study number 2017011]. Returning completed questionnaire survey was the evidence that students consented to participate in the study, so no consent form was required.

**Consent for publication**

Not applicable

**Competing interests**

The authors declare that they have no competing interests.

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