

Brief communication (Original)

Survey of attitude towards and understanding of the elderly amongst Chinese undergraduate medical students

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Background: Gerontology has an increasing role in medicine and public health. The provision of better medical services to the elderly closely correlates with the attitude towards and understanding of the elderly by medical personnel.

Objectives: We investigated factors affecting a medical student's choice of gerontology as a career. This included a survey of attitude towards the elderly and understanding of aging among first and third year Chinese undergraduates. Data between students in different streams, at different levels, and between sexes were compared.

Methods: Convenience sampling was used to recruit 335 undergraduate medical students in Sichuan for a survey using Kogan's Attitudes toward Older People Scale (KAOP) and Palmore's Facts on Aging Quiz (FAQ1) as tools.

Results: Among undergraduates, 71.3% did not acquire significant knowledge about the elderly (mean KAOP score 139.5 ± 16.0); and had a mean score of knowledge of aging (12.2 ± 2.7). The majority of first year students (98.7%) and third year students (98.8%) had a positive attitudes (KAOP > 102). The KAOP score among first year students was higher than that among third years ($P < 0.01$). Students with an interest in problems of the elderly had significantly higher scores and were more willing to consider careers in gerontology than students without an interest in the elderly ($P < 0.01$).

Conclusions: The majority of Chinese undergraduate medical students surveyed had positive attitudes towards elderly. We recommend greater accessibility of courses in gerontology to meet the increasing need for personnel in this health care sector.

Keywords: Attitude, elderly, knowledge, medical student

There are worldwide 870,000 people reaching 65 years of age every month [1]. Based on estimates, the elderly will comprise 70% of the population (120,000,000) in developing countries by 2025 [2]. The increase in the aging population in China has been rapid; the percentage of people >65 years old has increased to 9.1% of the total population in 2011 from 4.9% in 1982. Although aging is not a disease, aging has multiple effects on society and requires more skilled medical personnel to meet requirements. Aging also increases the burden of chronic noninfectious diseases [3]. Previous studies found that medical personnel who have worked in nursing wards for a long time have negative attitudes towards the elderly [4]. These attitudes towards the elderly result in negative attitudes and actions during treatment [5].

There have been few published studies investigating the attitudes of undergraduate Chinese medical students towards the elderly and their understanding of the elderly, and their interest in pursuing a career in gerontology.

Although there has been a continuous increase in elderly population, it has been reported that only a minority of medical students have an interest in gerontology [6], and that a majority of nurses are unwilling to work in nursing wards dealing with aged because of low salaries for such work and lack of interest [7]. Koh et al. [8] pointed out that taking care of the elderly is usually not considered an attractive career choice for medical and nursing students. Courses in geriatric nursing have often not been integrated into systemic studies [9, 10]. Kearney et al. [4] reported that the medical staff in cancer wards have negative attitudes towards the elderly. Kim et al. [11] found that more contact with the elderly during gerontology education could change the negative

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attitude of medical students towards the elderly. Of note, studies have also shown that medical students have positive attitudes towards the elderly [12-16]. Cheong et al. [14] reported that 98% of medical students in Singapore have positive attitudes towards the elderly, but lacked knowledge about the elderly and their problems [14]. This suggests that courses related to gerontology should be changed [9,10,17]. Lambrinou et al. [15] found that older people and women in Greece have a more positive attitude towards the elderly, which is consistent with studies conducted in Switzerland [16] and China [18]. A previous study indicated that nursing students in China (72.1%) are more willing to take care of the elderly than nursing students in Australia (45.3%) [19]. Together these reports indicate that there is room for better attitudes toward and knowledge of the elderly among professional medical personnel. Understanding the attitude of undergraduates and their level of knowledge of the elderly may be helpful in development of gerontology curricula [20]. In China, studies about attitudes towards the elderly have mostly focused on nurses and to our knowledge there have been few published studies involving students of other professional categories. Huang et al. surveyed nursing students from higher vocational colleges to determine knowledge concerning career choices and attitudes towards caring for the elderly. They found that nursing students in higher vocational colleges recognized the nursing needs of the elderly and had positive sentiment, but lacked knowledge of the physiology of aging. They concluded that it is necessary to construct quality courses in nursing the elderly and enhance the career potential for nurses in gerontology [21, 22].

The present study aimed to determine attitudes towards the elderly, knowledge about aging, and intention to pursue gerontology as a career amongst undergraduate medical students at various levels. Comparisons of the differences between students in different streams at various levels, and between students of different sex were made. The factors medical students consider dissatisfying about gerontology were studied.

Materials and methods

Participants

After approval of this study by our Institutional Review Board, 335 undergraduate medical students were recruited between July and September 2013 to complete a survey involving attitudes towards

and knowledge of the elderly. The present study complied with the principles of informed consent and respect for privacy. The nature, aim, methods, and confidentiality of the study were explained to students. The survey was conducted only after students voluntarily agreed to participate. The study complied with the principle of harmlessness; the scales had good reliability and validity, fewer items, a clear description, comprehensibility, and easy selection; therefore, we considered that completing the survey would not cause any physiological and psychological damage.

Methods

Kogan's Attitude toward Older People (KAOP) scale and the Facts on Aging Quiz 1 (FAQ1) were used for the survey. The KAOP scale was designed by Kogan in 1961 [23] to investigate the trends in attitude and degree of stereotyping amongst nurses, undergraduate nursing students, physicians, and students in related majors to the elderly, including 34 items composed of 17 positive items and 17 negative items, resulting in 2 dimensions of prejudice and appreciation. A 6-point Likert-like scale was used for assessment, with 1 representing strongly disagree, 2 representing disagree, 3 representing slightly disagree, 4 representing slightly agree, 5 representing agree, and 6 representing strongly agree. Negative items had opposite scores. The scores for each item were added together to obtain the total score, with a range of 34–204; the higher the score, the more positive the attitude [23]. A score of 102 was considered to be a neutral attitude towards the elderly [4]. The present study applied the Chinese version of the KAOP scale and Cronbach's alpha was 0.82 [4]. The FAQ1 was compiled by Palmore in 1977 [24] to measure understanding of aging and has been used in several countries. The Chinese version of FAQ1 sets the Cronbach's alpha at 0.68 and includes 25 single-choice questions with "yes, no, and don't know" responses. The correct answer for odd and even questions was "no" and "yes," respectively. The score range was 0–25; the higher the score, the higher the knowledge and understanding of aging [24].

Data collection

Investigators were trained and the questionnaires were delivered directly to students on site by investigators. After uniform instructions were provided and a complete understanding of the items was assured, the students were asked to complete the questionnaire

independently. The questionnaire was then collected immediately. The survey was performed in 2 groups (on-campus undergraduate students in year 3 before entering the hospital in July 2013 and on-campus undergraduate students in year 1 after entering the university in September 2013).

Statistical analysis

The data were entered into an Excel spreadsheet and analyzed using SPSS version 17.0. The basic demographic data were described with the mean, SD, and distribution, and analyzed with a Pearson chi-square test. The age difference at different levels of education (equal variance) was compared with independent sample *t* tests. The scores in attitude towards the elderly and knowledge of aging by students at different levels and by students in different streams were described with the mean and SD. The scores on attitude and knowledge by students at different levels, and by students in different streams, and by students of different sex had a Gaussian distribution. A comparison for two samples was performed with independent sample *t* tests. Multiple comparisons were performed using an ANOVA for

independent samples of equal distribution and a Kruskal–Wallis rank test for samples of unequal distribution. The interdependence of age, sex, and willingness to pursue career in gerontology was analyzed with logistic regression. *P* < 0.05 was set as the level of significant difference.

Results

Basic data concerning study participants

Three hundred thirty-five questionnaires were distributed and 325 questionnaires (97.0%) were returned, with an effective rate of 99.7%. Sixty-eight (21%) men and 256 (79%) women completed the questionnaires; their age range was 18–24 years (mean \pm SD, 18.4 \pm 1.1 for year 1 students and 21.4 \pm 1.0 for year 3 students). The majority of students had no significant knowledge of the elderly (71.3%) and 97.8% medical students rarely watched TV or read newspaper articles about the elderly. Of medical students, 64.8% had an interest in the elderly and 54% of medical students were willing to pursue careers related with gerontology. The basic information is listed in **Table 1**.

Table 1. Basic information regarding undergraduate medical students

Item	Year 1 n (%)	Year 3n (%)	<i>t</i>	<i>P</i>	Total n (%)
Mean age (year) (SD)	18.4(1.1)	21.4(1.0)	–24.7	0.000*	19.9(1.8)
Sex					
Male	42 (26.4)	26 (15.8)	5.5	0.019*	68 (21)
Female	117 (73.6)	139 (84.2)			256 (79)
Major					
Clinical medicine	61 (38.4)	64 (38.8)	5.4	0.066	125 (38.6)
Medical techniques	51 (32.1)	36 (21.8)			87 (26.7)
Nursing	47 (29.5)	65 (39.4)			112 (34.6)
Willing to live with the elderly					
Yes	92 (57.8)	77 (46.7)	4.1	0.057	169 (52.2)
No	67 (42.2)	88 (53.3)			155 (47.8)
Previous knowledge about the elderly					
Yes	45 (28.3)	48 (29.1)	0.2	0.875	93 (28.7)
No	114 (71.7)	117 (70.9)			231 (71.3)
Frequently watch TV or read newspaper articles about the elderly					
Yes	5 (3.1)	2 (1.2)	0.7	0.416	7 (2.2)
No	154 (96.9)	163 (98.8)			317 (97.8)
Interest in the elderly					
Yes	109 (68.6)	101 (61.2)	1.9	0.167	210 (64.8)
No	50 (31.4)	64 (38.8)			114 (35.2)
Willing to pursue a career in gerontology					
Yes	91 (57.2)	84 (50.9)	1.6	0.254	175 (54)
No	68 (42.8)	81 (49.1)			149 (46)
KAOP > 102	157 (98.7)	163 (98.8)	0.0	1.000	320 (98.8)

**P* < 0.05

Attitudes of undergraduate medical students about the elderly

The KAOP scale scores for students in year 1 ranged from 98–199 (mean \pm SD, 144.1 ± 15.6), including 157 students (98.7%) with positive scores (>102). The KAOP scale scores for students in year 3 ranged from 93–181 (mean, 135.2 ± 15.3), including 163 students (98.8%) with positive scores (>102). Three hundred twenty students (98.8%) had positive attitudes towards the elderly (KAOP > 102). Year 1 students had higher attitude scores towards the elderly than year 3 students ($P < 0.001$). Male students in year 3 had lower scores than female students ($P < 0.001$). The scores of students in clinical medicine, medical technology, and nursing were 140.1 ± 19.4 , 140.5 ± 13.9 , and 138.2 ± 13.2 , respectively ($P = 0.475$). The scores of students with and without

knowledge about the elderly were 148.3 ± 13.5 and 142.4 ± 16.0 , respectively ($P = 0.003$). The students with an interest in the elderly had higher scores than students with no interest in the elderly ($P < 0.001$). Students willing to pursue careers related to the elderly had higher scores than students not willing to pursue careers related to the elderly ($P < 0.001$). The results are shown in **Table 2**.

Elderly-related knowledge of undergraduate medical students

The results of the FAQ1 scale showed that knowledge of the elderly was scored 12.2 ± 2.7 in all medical students, 12.0 ± 2.8 (5–20) in year 1 students, and 12.3 ± 2.6 (6–19) in year 3 students. Male students in year 1 had higher scores than female students in year 1 ($P = 0.027$), as shown in **Table 3**.

Table 2. KAOP scores of undergraduate medical students

Item	Year 1 (n = 159)			Year 3 (n = 165)			Total (N = 324)		
	Mean (SD)	t	P	Mean (SD)	t	P	Mean (SD)	t	P
Sex	144.1 (15.6)	–	–	135.2 (15.3)		0.001*	139.5 (16.0)	–	–
Male	142.8 (18.5)	0.6	0.542	126.2 (13.7)	3.3	0.001*	136.5 (18.6)	–1.6	0.115
Female	144.5 (14.4)			137.3 (16.5)			140.4 (15.2)		
Major									
Clinical medicine	142.9 (19.9)	0.7	0.719	137.4 (18.8)	2.6	0.281	140.1 (19.4)	1.5	0.475
Medical techniques	144.1 (13.0)			135.4 (13.8)			140.5 (13.9)		
Nursing	145.5 (11.3)			133.9 (15.8)			138.2 (13.2)		
Willing to live with the elderly									
Yes	143.2 (14.9)	0.8	0.370	135.9 (16.9)	–0.6	0.577	139.9 (16.2)	0.4	0.720
No	145.3 (16.4)			134.6 (13.8)			139.2 (16.0)		
Have knowledge of the elderly from previous education									
Yes	148.3 (13.5)	–2.2	0.030*	136.0 (16.4)	–0.6	0.670	141.2 (16.2)	–1.7	0.087
No	142.4 (16.0)			135.4 (16.7)			138.6 (15.9)		
Frequently watch TV or read newspaper articles related to the elderly									
Yes	148.6 (13.5)	–1.1	0.510	157.5 (3.5)	–2.1	0.038*	151.1 (12.0)	–2.3	0.053
No	143.9 (15.6)			135.3 (16.5)			139.3 (16.0)		
Interest in the elderly									
Yes	146.2 (14.4)	–2.6	0.011*	138.2 (14.1)	–3.2	0.001*	142.3 (14.8)	4.4	0.000*
No	139.5 (17.2)			130.5 (16.0)			134.4 (17.1)		
Willing to pursue a career in geratology									
Yes	147.6 (14.1)	3.4	0.001*	136.7 (15.3)	0.8	0.425	142.1 (15.8)	3.2	0.02*
No	139.3 (16.1)			134.2 (15.4)			136.6 (15.9)		

* $P < 0.05$

Table 3. FAQ1 scores of knowledge of aging amongst undergraduate medical students

Items	Year 1			Year 3			Total		
	Mean (SD)	<i>t</i>	<i>P</i>	Mean (SD)	<i>t</i>	<i>P</i>	Mean (SD)	<i>t</i>	<i>P</i>
Sex	12.0 (2.8)		–	12.3 (2.6)		0.318	12.2 (2.7)		–
Male	12.8 (3.1)	–2.2	0.027*	12.0 (2.7)	0.6	0.541	12.5 (3.0)	1.2	0.219
Female	11.7 (2.6)			12.4 (2.5)			12.1 (2.6)		
Major									
Clinical medicine	12.2 (3.1)	–0.2 (F)	0.822	12.0 (2.6)	2.6 (F)	0.079	12.1 (2.9)	1.3 (F)	0.278
Medical techniques	11.9 (2.7)			12.0 (2.5)			12.0 (2.6)		
Nursing	12.0 (2.4)			12.9 (2.5)			12.5 (2.5)		
Willing to live with the elderly									
Yes	12.2 (3.0)	–1.0	0.318	12.3 (2.6)	–0.1	0.916	12.2 (2.8)	0.5	0.597
No	12.1 (2.9)			12.3 (2.6)			12.1 (2.5)		
Having knowledge related to the elderly from previous education									
Yes	12.7 (2.8)	–1.8	0.066	12.4 (2.3)	0.3	0.916	12.5 (2.6)	–1.2	0.158
No	11.8 (2.7)			12.3 (2.7)			12.0 (2.7)		
Frequently watch TV and read newspaper articles related to the elderly									
Yes	13.8 (1.3)	–0.5	0.146	12.5 (3.5)	–0.1	0.921	13.4 (1.9)	–4.0	0.209
No	12.0 (2.8)			12.3 (2.6)			12.1 (2.7)		
Interest in the elderly									
Yes	12.1 (2.6)	–0.5	0.612	12.5 (2.7)	–1.0	0.302	12.3 (2.6)	1.0	0.315
No	11.9 (3.1)			12.1 (2.3)			12.0 (2.7)		
Willing to pursue a career in geratology after graduation									
Yes	12.3 (2.8)	1.6	0.122	12.3 (2.4)	–0.2	0.951	12.3 (2.6)	0.9	0.273
No	11.6 (2.8)			12.3 (2.7)			12.0 (2.7)		

* $P < 0.05$

Factors affecting undergraduate medical student to pursue a career in gerontology

Based on regression analysis with a willingness to pursue a career in gerontology as a dependent variable, and age, sex, level of study, and attitude towards the elderly and interest in the elderly as independent variables, we predicted whether or not undergraduate medical students would pursue careers in gerontology. An interest in the elderly was positively correlated with a willingness to pursue a career in gerontology ($P < 0.001$; odds ratio = 4.5), suggesting that students with an interest in the elderly are 4.5-fold more likely to pursue a career in gerontology than students without an interest in the elderly.

Discussion

Because of the increase in the number of elderly in China, gerontology has a correspondingly increasing importance in the future of medicine. This creates a challenge for medical personnel in the field of gerontology. The provision of better medical services

for the elderly is closely correlated with attitudes towards and understanding of the elderly by medical personnel. However, the undergraduate medical student curriculum in China regarding elderly care is wanting and there are limited resources for medical students to access knowledge related to the elderly. These shortcomings result in different views by medical students, some of whom consider the elderly to be a social burden and they become unwilling to pursue careers related to the elderly, which in turn further increases the challenge to improve gerontology education in China.

This study indicated that approximately 70% of undergraduate medical students in year 3 had no knowledge concerning the elderly, suggesting that gerontology education in China is limited and also not compulsory. Jansen et al. [17] pointed out that a systemic study of gerontology significantly improves the attitudes of students towards the elderly, but with a short-lasting effect. Leung et al. [25] conducted a random control study to investigate the establishment

of long-term enhancement of knowledge of aging in medical students and an effective intervening model regarding attitude towards the elderly. Leung et al. [25] reported that knowledge and attitude in the intervention group were effectively enhanced, but the long-term effect was not ideal. These results suggest that medical educators need to stress the importance of gerontology courses, change the negative attitude of students to the elderly, emphasize the modeling effect of clinical teachers, and provide a chance for students to contact and collaborate with elders. These strategies will strengthen the understanding of the elderly by students through their personal experience. A study in Korea [11] also pointed out that communication experience with the elderly, living experience, and interest significantly affect the attitudes of undergraduate nursing students, suggesting that educators should increase student contact with the elderly to improve their attitudes towards them.

Of medical students, 64.8% showed an interest in the elderly and students having an interest in the elderly had higher knowledge scores than students without an interest in the elderly. Regression analysis indicated that the choice of a career in gerontology by students having an interest in the elderly was 4.5-fold that of students without an interest in the elderly, and 54% of medical students wanted to pursue a career in gerontology after graduation. These rates were clearly higher than in the US and Switzerland, and may be related to the living experience during childhood. Because children in China have more contact with grandparents during childhood, children in China have emotional ties to the elderly, which is helpful in establishing positive attitudes and rectifying prejudices and age discrimination. Children in European countries usually live with parents and have less contact with the elderly, which results in geriatric medical and nursing professions being unpopular in European countries [7]. The majority of nurses in Switzerland are unwilling to work with elderly [16]. The major problems with working with elderly were poor knowledge among nurses about the elderly (35.5%), deficient skills and experience (26.2%), incomplete technical set-ups in the hospitals (55.6%), poor physical conditions of the elderly (50%), administrative problems (47.2%), and communication problems (41.8%) [26]. Every type of difficulty nurses experienced in the care of older patients was investigated by a binary variable (yes or no) items were independent and result was more than 100%.

The scores using the KOAP scale indicated that 98.8% of undergraduate medical students had positive attitudes towards the elderly, students in year 1 had higher scores than students in year 3, and male students had higher scores than female students. Undergraduate medical students had poor knowledge related to the elderly, with a corrected rate of FAQ1 <50%. Based on a systematic review by Lovell et al. [27], it was concluded that American nursing students had negative attitudes towards the elderly [27]. Cozort [9] also reached a similar conclusion; specifically, most nurses were unwilling to do jobs related to the elderly because of personal preferences, and working experience. A study in Switzerland also pointed out that the attitudes towards the elderly were more positive following increases in age and work experience, and that men had less enthusiasm for working in gerontology than women [16]. This conclusion was confirmed by Lambrinou et al. [15]. These studies suggested that educators should reinforce guidance to younger nurses and male nurses. A study involving 275 medical students by Taiwan researchers indicated that the KAOP score was 144.3 ± 17.89 and >50% in medical students [23]. Bergman et al. [28] reported that Chinese nursing students had more positive attitudes towards the elderly than Australian nursing students. Our results suggest that Chinese medical students have more positive attitudes towards the elderly. The reasons for the differences are that the Oriental traditional customs of respecting the elderly have a deep and lasting effect. Most of our youth think that the elder generation worked hard to contribute to society and to their family and that they deserve respect. Simultaneously, the social attitude also grants greater authority to the elderly. Therefore, Chinese nursing students have more positive attitudes to the aged than European students. However, male nursing students have less of a stable professional attitude toward the aged. This may be a consequence of the fact that in Chinese families, taking care of the elderly is usually done by women.

The present study used convenience sampling to investigate the attitudes towards and knowledge of the elderly by undergraduate medical students. Results were limited to the present survey and should not be extrapolated to all undergraduate medical students, which may require random investigation with larger samples. Although the Chinese versions of the KAOP and FAQ1 have high reliability and validity, the answers of respondents may not be true and require

further measurement with more objective indices. Furthermore, the items examined were limited and did not cover all knowledge. The present study indicated that the more knowledge was recognized, the higher the positive attitude and interest to the elderly, and the higher the intention to choose jobs related to gerontology. An investigation of how to design gerontology-related courses to enhance knowledge and interest of medical students to care for the elderly is warranted.

Conclusion

The majority of Chinese undergraduate medical students surveyed in Sichuan had positive attitudes towards the elderly, but lacked related knowledge of the elderly. We recommend greater accessibility of courses in gerontology to meet the increasing need for personnel in this health care sector.

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