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Global health education in Chinese universities and potential for collaboration with schools of nursing: A qualitative study

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ABSTRACT

Background: The Chinese Consortium of Universities for Global Health (CCUGH) was established within schools of public health in 2013 with the goal of enhancing global health in China. Expanding nursing students' exposure to global health curricula is important as nurses are essential actors in the health care system. However, information related to existing global health education within CCUGH-affiliated universities and the current engagement of Chinese schools of nursing in global health remains extremely limited.

Objective: To identify and describe the current definitions and conceptualizations of global health education in Chinese universities, with a focus on schools of nursing, in order to explore potential opportunities for strengthened collaboration between global health initiative and schools of nursing in China. **Methods:** Purposive sampling with snowballing was used to recruit 19 key informants who were critical stakeholders in global health and nursing in China. Key informant interviews were conducted from July 2014 to February 2015, and data were updated in June 2016. Content analysis was used to analyze data via Atlas.ti 7.

Results: There was a rapid growth in global health education within and beyond CCUGH-affiliated universities with nine universities establishing global health institutes. Translation and definition of global health lacked consistency in Chinese language. Though no course directly related to global health was offered, schools of nursing were gradually participating in global health education and research. Nursing was a critical component of global health, and global health and nursing mutually advanced each other. Nursing education should include global health contents, but at present independent global health curriculum in schools of nursing was not appropriate.

Conclusion: Increasingly Chinese universities are promoting global health education through the platform of CCUGH. It is an ideal moment to promote and expand work across the fields of global health and nursing, specifically to highlight opportunities for collaboration across education, research and practice.

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1. Introduction

From the 1990s forward the era of globalization has resulted in an increasingly interconnected world [1]. Globalization is affecting the economy, politics, education and also specific professions, including nursing [2]. Global health has been defined as “an area for

study, research, and practice that places a priority on improving health and achieving equity in health for all people worldwide”, and involves “many disciplines within and beyond the health sciences and promotes interdisciplinary collaboration” [3]. In 2009, the Consortium of Universities for Global Health (CUGH) was established with the mission to “define the field of global health,

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standardize curricula, expand research, and coordinate projects in low-resource countries" [4]. In 2013, the Chinese Consortium of Universities for Global Health (CCUGH) was established by 10 schools of public health within Chinese universities, with the goal of enhancing global health in China. These consortiums engage a variety of disciplines including public health, medicine, dentistry, pharmacy, and nursing to achieve their stated goal.

Nurses and midwives play an essential role in health care systems worldwide providing about 90% of health care globally [5]. As nurses and midwives make up the largest proportion of the global health workforce (35 million, 80%), their engagement in global health is crucially important [6]. Yet, references related to global health education within CCUGH-affiliated universities and the involvement of schools of nursing in global health in China remain extremely limited.

In April 2013, the Chinese Nursing Association officially became a member of the International Council of Nurses (ICN), an international body whose mission is to ensure quality nursing care for all and sound health policies globally [7]. By the end of 2015, China has more than 3.24 million nurses [8], and is well positioned to play an important leadership role in global health nursing. However, despite this growing interest in global health in China—shown by the establishment of CCUGH, the engagement with the field of nursing has been limited. As health becomes increasingly global, there are significant implications for nurses as the primary providers of health services [6]. Therefore, the preparation of Chinese nurses in global health, and their increasing participation in global health research and in policy forums are an important step to improve healthcare globally. A comprehensive understanding of the current development of global health education in Chinese universities and potential opportunities for collaboration between global health and nursing is of great importance.

The aim of this study is to identify and describe the current definitions and conceptualizations of global health education in Chinese universities, with a focus on Schools of Nursing, in order to explore potential opportunities for strengthened collaboration between global health initiative and Chinese Schools of Nursing.

2. Methods

2.1. Study design

This study was a qualitative research using key informant interviews for data collection. Key informants are knowledgeable people who are likely to provide needed information, ideas and insights on a particular subject, and key informant interviews can provide data and insights that cannot be obtained from other methods or sources [9]. The data collection, analysis, and reporting followed the Consolidated Criteria for Reporting Qualitative Research (COREQ) [10,11].

2.2. Participants

Purposive sampling with snowballing was used to recruit 19 key informants who were critical stakeholders in global health and nursing in China, principally directors at global health institutes or deans at schools of public health affiliated with the CCUGH ($n = 7$), and deans at schools of nursing affiliated with the China Medical Board (CMB) China Nursing Network ($n = 8$), and professors or directors from other Chinese universities and NGOs ($n = 4$).

2.3. Data collection

From July 2014 to February 2015, key informant interview data were collected via open-ended, semi-structured interviews held

either in person, by telephone/Skype, or e-mail (1 case). Especially, data related to current status of global health institutes were updated in June 2016 with three key informants. All interviews were conducted by the first author in Chinese (Mandarin) or English. The interview guide was developed through team discussion and literature review. The interview guide included the following key domains: (1) key informant's definition of global health; (2) current global health activities in key informant's school/institute; (3) key informant's perception of the relationship between global health and nursing, and how they can contribute to each other; and (4) resources and barriers to establishing/expanding global health curriculum in schools of nursing. The interviews lasted approximately 30–60 min and were audiotaped, and notes were also taken during the interviews to highlight key commentary. We stopped recruiting key informants when data achieved saturation.

2.4. Data analysis

The interviews were transcribed verbatim, in either Chinese or English by the first author and subsequently summarized in English. A codebook was developed and data were analyzed using content analysis. All transcripts were read at least three times and coded by three bilingual authors (Chinese and English). The meanings of significant sentences were identified and these formulated meanings were then organized into clusters of themes using Atlas.ti 7.

2.5. Ethics approval

The Institutional Review Board at the University of Washington approved this study on June 16th, 2014 (IRB No. 47682). At the outset of the interviews, the purpose and scope of the research and key informants' rights were clearly explained, and signed informed consents were obtained from all key informants.

3. Results

Nineteen key informants participated in the study. Their characteristics are highlighted in Table 1.

Table 1
Characteristics of key informants ($n = 19$).

Characteristic	n (%)
Gender	
Female	11(58)
Male	8(42)
Age (years)	
30–39	1(5)
40–49	8(43)
50–59	9(47)
≥60	1(5)
Length of practice (years)	
5–9	1(5)
10–19	3(16)
20–29	10(53)
≥30	5(26)
Professional title	
Associate Professor	1(5)
Professor	16(85)
Director Nurse	1(5)
Not applicable	1(5)
Education	
Master	4(21)
PhD	15(79)

3.1. Current status of global health education in Chinese universities

3.1.1. Rapid growth in global health education within and beyond CCUGH-affiliated universities

As of June 2016, nine CCUGH-affiliated universities had established global health institutes including: Peking University, Wuhan University, Fudan University, Chinese University of Hong Kong, Duke Kunshan University, Zhejiang University, Central South University, Dalian Medical University and Sun Yat-sen University (Table 2). Wuhan University and Duke Kunshan University provided bachelor's and/or master's level educational program related to global health. Wuhan University recruited nine undergraduate students and six graduate students to its education programs which began in September, 2014. Similarly, Duke Kunshan University launched its master's education degree in global health in September, 2014. These global health institutes were established within schools of public health with the exception of Wuhan University whose global health institute was situated at an equivalent bureaucratic level as the school of public health, and Sun Yat-sen University whose global health institute was a university level center under SYSU Institute of National Governance.

Outside of these bachelor's and master's education programs of global health, global health education provided by these global health institutes mainly included: (1) international summer course (e.g. *Achieving MDGs for Global Health* represented by Fudan University Global Health Institute); (2) short-term training courses (e.g. *The Way to Geneva* represented by Peking University Institute for Global Health, *International Practice on Global Health* represented by Central South University Center for Global Health); (3) selective courses (e.g. *Introduction to Global Health*, *Global Health with Multidisciplinary Perspective* represented by Fudan University Global Health Institute), and; (4) other forms like different sorts of workshops (e.g. CCUGH Writing Workshop organized by Sun Yat-sen University Global Health Institute and Duke Kunshan University Global Health Research Center).

Beyond the CCUGH-affiliated universities, many universities like Jiangxi University of Traditional Chinese Medicine, Hainan Medical University reported considerable interests in establishing global health institutes or education program. Tsinghua University provided global health master (MPH) programs to international students with full scholarship to all students from low and middle income countries (LMIC). As of September 2016, there had been 18 member universities for CCUGH after Dalian Medical University, Guangxi Medical University, Nanjing Medical University, Shandong University, Third Military Medical University, Tsinghua University, Xi'an Jiaotong University and Xinjiang Medical University becoming new members.

3.1.2. Evolving from “xu ti” to “shi ti”

The global health institutes present at these universities were categorized as either a virtual form “xu ti” or as a physical entity

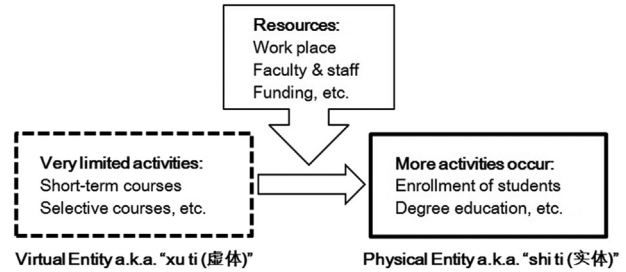


Fig. 1. Universities with global health institutes in China.

“shi ti”. The virtual establishment of a global health institute was typically defined by one with very limited work space, full time faculty, and other necessary resources required to perform critical activities such as capacity building and course development (Fig. 1). This virtual form was typically established as an initial platform to initiate global health activities. When enough resources were mobilized, the physical entity of a global health institute, normally with dedicated space and full time faculty members, was established and then more concrete activities including establishment of degree programs and enrolment of students could occur. The virtual entity was a helpful step to the definition of related policies and recruitment of necessary resources prior to the establishment of an actual physical entity.

3.1.3. Lack of consistency in translation and definition of global health

The Chinese translation of global health varied between “quan qiu jian kang” and “quan qiu wei sheng”. Nine key informants preferred “quan qiu jian kang”, and five key informants showed neutral attitudes towards both “quan qiu jian kang” and “quan qiu wei sheng”. For key informants who supported to use “quan qiu jian kang”, they felt it had a much broader meaning, and included the status of being healthy and living a long life. They thought that the English word “health” should be translated as “jian kang” instead of “wei sheng”. Furthermore, “wei sheng” was believed to be relatively limited and easily be misunderstood as “hygiene” in Chinese. Actually, “gong gong wei sheng”, the Chinese translation of “public health” was mentioned to be inappropriate if considering the above reasons. However, since “gong gong wei sheng” had been used for quite a long time and it might not be possible to change this term.

On the other hand, some key informants preferred “quan qiu wei sheng” because it not only included the meaning of “jian kang” but conveys a greater focus on policy, management and health care system. This connection between “wei sheng” and policy, management and health care system was believed to be caused by the fact that many healthcare-related ministry, organization, system and health education textbooks were named as “wei sheng”, such as Ministry of Health which is translated as “wei sheng bu”, World

Table 2
Established global health institutes in universities in China.

Name of universities	Name of global health institutes	Full Chinese name of institutes	Foundation year	Location
Peking University	Institute for Global Health	北京大学全球卫生研究中心	2006	Beijing
Wuhan University	Global Health Institute	武汉大学全球健康研究中心	2011	Wuhan
Fudan University	Global Health Institute	复旦大学全球健康研究所	2012	Shanghai
Chinese University of Hong Kong	Center for Global Health	香港中文大学全球卫生中心	2013	Hong Kong
Duke Kunshan University	Global Health Research Center	昆山杜克大学全球健康研究中心	2013	Kunshan
Zhejiang University	Institute for Global Health	浙江大学全球卫生中心	2013	Hangzhou
Central South University	Center for Global Health	中南大学全球卫生中心	2014	Changsha
Dalian Medical University	Research Center for Global Health	大连医科大学全球健康研究中心	2015	Dalian
Sun Yat-sen University	Global Health Institute	中山大学全球卫生研究中心	2015	Guangzhou

Health Organization which is translated as “shi jie wei sheng zu zhi” and thus left a strong impression of policy and health system connotation towards the expression “wei sheng”. As illustrated in Table 2, five global health institutes were named with “wei sheng” and four with “jian kang”.

Admitting the fact that there existed debates on the translation of “quan qiu jian kang” and “quan qiu wei sheng”, three key informants mentioned efforts should be made to decide how to translate global health into Chinese to avoid misunderstanding and better systematizing the representation of the meaning of global health in Chinese.

The definition of global health was not consistent among key informants. However, several key phrases emerged among key informants when asked to define global health. “Involving all human beings and health issues worldwide and their influencing factors”, “trans-discipline, organization, country and government” and “achieving health equity worldwide” were three most frequently mentioned themes. There was no consensus on the theoretical definition of global health, however, it was vitally important to have an operational definition of global health to guide the emerging activities related to global health.

3.2. Current status of global health education in schools of nursing

3.2.1. Emerging contents related to global health in schools of nursing

There was no course directly related to global health in schools of nursing interviewed in this sample. In schools of nursing, experts from foreign countries and professors in global health field were invited to lecture on global health topics of interest. Some components of global health were mentioned in current nursing curricula and other transdisciplinary lectures. One school of nursing included the Lancet paper entitled “China and Global Health” as a class reading in order to familiarize her students to the concept of global health.

Key informant 5: “Bachelor's curricula don't include Global Health course, but do include related courses. We have opened Health Education and Disaster Nursing, and they are related to global health.”

Key informant 7: “Currently we don't have this certain course, but we frequently invite foreign speakers to give lectures in our school, and sometimes they will touch this part (global health).”

Key informant 6: “There is an article published in the Lancet which is written by Lincoln Chen ... almost all our undergraduate students have read it ... When I gave lessons of Introduction to Nursing, I printed out the article and spread out, one Chinese version and one English version. I gave them English version first. I asked students to share their thoughts about the article when they finished reading, and then I gave them the Chinese translation version.”

3.2.2. Schools of nursing's gradual involvement in global health education and research

Schools of nursing started to participate in global health education and research activities through various approaches, such as: providing staff to support global health joint course and DFID (Department for International Development) Project together with school of public health; involved in the establishment of global health institute; holding Sino-US conference titled “Nursing and Global Health”; sending nursing students to global health summer training course offered by school of public health.

Key informant 1: “Faculty from nursing school give lectures on neonatal health in my (global health) course ... we (school of public health) applied for DFID Project, and school of nursing is involved in OP3.”

Key informant 8: “We established global health research center, and included school of nursing in order to bond nursing and global

health more tightly.”

Key informant 11: “This is the first Sino-US nursing conference and the theme is ‘Nursing and Global Health’. The majority of the audiences come from nursing field, and we also invite people from public health and public policy.”

Key informant 3: “Our nursing students also join their (school of public health) global health activities like global health summer school, two students went there.”

3.3. The potential for nursing to participate in global health

3.3.1. Nursing as a critical component of global health

All key informants agreed that global health and nursing were closely related. Under the concept of both practice and discipline, nursing was an important component of global health.

Key informant 9: “Nursing participates in global health activities as a practical field. During global health activities, nursing is a critical component of global health.”

Key informant 11: “Global health is a much broader field, and nursing is a part of global health.”

Key informant 19: “Nursing is one of disciplines of global health, and nursing can play an important role in global health.”

3.3.2. Mutual advancing between nursing and global health

Five key informants mentioned that global health and nursing mutually advanced each other.

Key informant 4: “Global health and nursing is in the relationship of mutual connected and mutual promoted.”

Key informant 12: “Nursing can make contributions to global health, ideas from global health promote nursing development, and this is two-way process.”

Nursing became important force for global health through direct nursing practice and tremendous nurse population.

Key informant 5: “Lots of medical treatments and decisions should be implemented through nursing, via nurses' hands, nurses' heads; in order to achieve global health, nursing workforce should not be absent.”

Key informant 14: “In global health projects, nurses or nursing personnel are greatly needed, and they can function more in communities. From the perspective of human resource, nurses and nursing are greatly related to global health.”

Global health promoted nursing development through widening horizons of nursing, encouraging nursing to borrow ideas and experience from other disciplines and countries, advancing nursing education and research reform, and encouraging nurses to join in addressing international health care issues.

Key informant 7: “Some researches and ideas from global health can broaden horizon and scope of knowledge for nursing.”

Key informant 19: “Nursing can enrich itself by borrowing ideas from disciplines like economics, public policy, sociology, psychology and even law which is not so close to health care.”

3.3.3. Nursing education should include contents related to global health

Nearly all key informants emphasized that global health education should be contained in nursing education. Some key informants added that all medical students and non-medical students from health care related majors should be familiar with the concept of global health. The full-scale implementation of adding global health contents into nursing education did not have to take place in all schools of nursing, but those with relatively abundant resources.

Key informant 6: “I always agree with the idea that there should be this (global health) course.”

Key informant 12: “With regard to global health curriculum, I

think not just schools of nursing need it, all personnel in medicine and public health fields should have basic understanding of global health. Furthermore, non-medical personnel who work in fields like international trade, environmental management, food security and diplomacy should also know the concept of global health.”

3.3.4. Independent global health curriculum not appropriate for schools of nursing

To establish independent global health curriculum (single course on global health) in schools of nursing faced obvious barriers and obstacles: schools of nursing did not know global health and lacked global health concept; contents in global health curriculum for nursing education was not clear; schools of nursing lacked accumulation of global health activities and lacked faculty capable of teaching global health; establishing new curriculum required complicated approval process and revision of training plan, and current course loads in schools of nursing had already been very full.

Key informant 3: “If we really establish this (global health) curriculum in nursing in China, the key questions would be: what are the contents of this course? What is the relationship between this course and Global Health curriculum in schools of public health? What are the unique parts for this curriculum?”

Key informant 5: “If we establish global health curriculum in our school, our main obstacle would be faculty, since at present no one is able to give this lecture.”

Instead of establishing independent global health curriculum in schools of nursing, more appropriate approaches to including global health contents into nursing education during this period of time would be: taking global health curriculum offered by school of public health as an elective course; adding global health contents into existing nursing curricula; providing lectures related to global health; fully taking advantage of Internet education resources like MOOCs.

Key informant 7: “Many schools of nursing belong to comprehensive universities or medical universities, which have excellent schools of public health and even global health institutes, and a lot of global health contents are available. I think all these resources could be used by schools of nursing to promote global health education.”

4. Discussion

This study is the first to explore global health education in Chinese universities, and specifically detail the potential for nursing school collaboration.

Global health first appeared in public health field, and it is an extension and expansion of concepts of public health as well as international health [12]. There have been lots of universities worldwide establishing global health-related curriculum, training courses, research institutes and degree education [13,14]. As for 2011, more than 250 universities in United States have begun global health activities, among which 70 have established global health institutes, 71 have opened global health curriculum, and more than ten universities have degree education for bachelor, master and doctor [15]. Meanwhile, academic groups aiming for advancing global health appeared as well, like Global Health Education Consortium (GHEC) and CUGH in United States, and European Academic Global Health Alliance, Italian Network for Global Health Teaching and Latin American Alliance for Global Health founded worldwide.

China is increasingly participating in global health [16], and trying to contribute to global health with Chinese characteristics [17]. China has made rapid progress in global health from deploying medical teams, constructing facilities, to donating drugs and equipment, and training personnel [17]. The establishment of

CCUGH in 2013 was a milestone for prioritizing Chinese global health-related activities [18]. This study found that CCUGH-affiliated universities have been actively engaged in global health activities, and play an important role in promoting global health education, research and training, regardless of whether they have established global health institutes. Currently global health is being primarily based in schools of public health in China and is an increasingly popular area among Chinese academics. Ministry of Education approved global health as an independent “discipline” in 2013, and Wuhan University School of Public Health became the first university to recruit bachelors and masters majoring in global health [19–21]. Although the initial form of most global health institutes was so-called “xu ti”, they are able to conduct training and research related to global health and function as a platform of collaborations between professors from various schools. This linear process from “xu ti” to “shi ti”, from a virtual form to an entity institute or department, is not a phenomenon unique to Chinese universities, for example, Department of Global Health at University of Washington took years to develop before becoming an entity department [22].

The translation and definition of global health in Chinese need to be clarified. Currently, there is no unified translation and definition of global health in Chinese language and “quan qiu jian kang” is more preferred [23], though the first global health institute in China systematically conducting global health activities, Peking University Institute for Global Health, uses “quan qiu wei sheng”. “Quan qiu” means “global”, and both “jian kang” and “wei sheng” can mean “health” in Chinese with different connotations. The translation is not a trivia matter as it conveys different perspectives debate on what is global health. Actually, with regard to definition, there is no difference between “quan qiu jian kang” and “quan qiu wei sheng”, but these two different Chinese translated terms of global health do provide slightly different understandings in Chinese language: “quan qiu jian kang” was believed to have a broader meaning and to be more closely related to the concept of “jian kang” health; “quan qiu wei sheng” was believed to be relatively limited and easily be misunderstood as “hygiene” in Chinese due to its “wei sheng”, however, “quan qiu wei sheng” was also closely connected to some macroscopic concepts like policy, management and health care system due to terms like “wei sheng bu” Ministry of Health, “shi jie wei sheng zu zhi” World Health Organization. In 2014, there was a definition of global health in China agreed by a group of Chinese experts who were developing the first series of global health textbooks for bachelor’s and master’s degree education in global health. It is the first published attempt to define global health in Chinese literature, beyond simply using the literal translation of its western definition, which is: global health is an emerging *trans-disciplinary* subject combining research and practice which aims to improve health of all human beings; the health issues which global health is focusing on are beyond national boundaries and governments, and require mobilizing all efforts globally involving human health care and its determinants as well as solutions, and to response in a harmonious and effective manner [12].

The ultimate goal of nursing is to protect all people’s health through nursing activities and improve the health level for all mankind [24]. The goal of global health is to improve health and achieve equity in health for all people worldwide [3]. With regard to goals of two disciplines, those of nursing and global health are quite similar. Nurses have been and will continue to be active on the frontlines of healthcare everywhere in the world: cities, suburbs, hospitals, clinics, even war zones and refugee camps [25], caring for greater than 80% of the world that is impoverished, starving, and dying from preventable conditions [26]. Nowadays, health issues are never isolated within the borders of a single country. The Ebola

epidemic in West Africa, MERS in South Korea, Nepal's earthquake rescue, etc., all raise the attention of the whole world and again make people be aware of the importance of global health. We should also notice that nurses are the workforce who will suffer the most during this epidemic and ultimately be the ones to solve it. Nursing has the capacity to connect with individuals, families, communities, and it is crucial to prepare our nurses to bring their experiences, knowledge and collective wisdom more effectively to the global health arena. In this way, resources can be more effectively and efficiently allocated, and health can improve.

Although considerable research and papers about global health exist, very limited Chinese published articles in nursing field discussing global health issues was identified. Our study showed that no global health courses are currently offered in schools of nursing in China. Fortunately, we have found that schools of nursing are beginning to expand their work in global health activities through many ways. The Chinese Nursing Association's returning to ICN in 2013 makes Chinese nursing on the global stage, and Chinese population accounting for nearly 20% global nurses will further contribute to global nursing [27]. Schools of nursing in China need to expand understanding and knowledge of global health and cultivate nurses with global health concept in order to address increasingly complicated health care issues. In this study, all participants agreed that global health-related contents should be included in nursing education. Schools of nursing in developed countries have made necessary preparation and accumulation for establishing global health awareness and global health curriculum due to their long term nursing activities in low and middle income countries and multidisciplinary collaboration with other fields such as public health. Unlike schools of nursing in developed countries, lacking these preparation and accumulation makes it difficult for schools of nursing in China to add global health-related contents in nursing education. Schools of nursing in developed countries have conducted researches about how to define global health and how to introduce global health into nursing curricula [28], and proposed global health competency which nurses should have [29]. Although the definition of global health has been provided with the publication of Chinese first global health textbooks, global health education and global health competency for Chinese nurses remain blank. Thus, it is high time for Chinese schools of nursing to start embracing global health. Schools of nursing should take adding global health education into nursing as an opportunity to promote development of nursing and global health through multidisciplinary collaboration and participating in global health education, research and practice.

Increasing nursing engagement in global health will result in more appropriate and efficient allocation of resources to address health needs of people worldwide. With large numbers of Chinese nurses who are informed and trained with the concept of global health, one should assume Chinese nurses are likely to play a more important role in providing health care in domestic and overseas in the future.

5. Limitations

Purposive sampling with snowballing was used as sampling methods and 19 key informants were successfully recruited from different universities and organizations, however, it is non-probability sampling method.

6. Conclusion

Increasingly Chinese universities are promoting global health education through the platform of CCUGH. It is an ideal moment to promote and expand work across the fields of global health and

nursing, specifically to highlight opportunities for collaboration across education, research and practice.

Declaration of interests

The authors declare no competing interests.

Author contributions

Quanlei Li, Sarah Gimbel and Stephen Gloyd contributed to the conception and design of the paper. Sarah Gimbel and Stephen Gloyd supervised the conduct of the study. Quanlei Li, Dong Xu, Yan Hu and Huaping Liu undertook recruitment of participants, data collection and data analysis, including quality control. Dong Xu, Yan Hu and Huaping Liu provided methodological advice on study design. Quanlei Li drafted the manuscript, and all authors contributed substantially to its revision. All authors have critically reviewed and approved the final paper.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.ijnss.2016.12.001>.

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