

ORIGINAL RESEARCH

Analyzing educational needs to develop an undergraduate global health nursing program

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ABSTRACT

Objective: The educational needs of nursing undergraduate students from South Korea, Vietnam, and the United States were assessed to develop an educational program for Global Nursing to improve undergraduate nursing education internationally.

Methods: Borich's needs assessment tool was used to measure and validate present and required competency levels of participants' perceptions of educational needs. Data were collected from December 2014 to March 2015.

Results: Educational needs significantly differed by overseas study experience (higher for those with such experience) but not by gender. The three countries significantly differed in terms of educational needs (South Korea > the United States > Vietnam) on global health nursing. Educational needs by country showed that variables pertaining to healthcare competencies in developing countries were highest in the US, followed by Vietnam, and South Korea. The variables with the highest scores were globalization of health in the US, health implications of migration in Vietnam, and globalization of health in South Korea. Global nursing education needs slightly differed between the three countries. This could be due to differences in educational environments.

Conclusions: An international strategy for standardizing undergraduate global nursing curriculum is needed. Additionally, a mechanism to compare and contrast curriculums using global standards recognized by accrediting bodies and organizations, such as the International Council of Nurses, is required. Furthermore, core curriculum should direct nursing schools offering international programs to consider cultural differences and define differences in health care systems, societal norms, and environmental complexities that students will encounter abroad. Future studies should examine similarities and differences that these students might encounter when entering a host country.

Key Words: Competency, Education, Global health nursing, Needs, South Korea, the United States, Vietnam

1. INTRODUCTION

An important achievement of nursing education programs today is the recognition of integrating cultural competency and global health nursing into the curriculum. In fact, the American Association of Colleges of Nursing (AACN), in their white paper on Cultural Competency in Baccalaureate Nursing Education,^[1] highlights cultural competence as

a necessary skillset for nursing graduates in several of its documents. Additionally, the AACN suggests that utilizing elements of cultural competency within nursing curriculum enables nursing graduates to identify, respect, and address differences in patients' values, preferences, and expressed needs.^[1] Furthermore, programs that include cultural competency in their curriculum are more apt to provide students

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with a deeper understanding of social justice and human rights.^[2] Inclusion of cultural competence in nursing programs is required now more than ever to ensure that our current nursing graduates are able to bring their expertise to a global healthcare market.

Cultural competency is defined as “the capacity to provide effective healthcare taking into consideration people’s cultural beliefs, behaviors, and needs”.^[3] According to Papadopoulos, Tilki and Taylor,^[3] developing skills in cultural competency is a result of synthesizing knowledge acquired during experiences in an individual’s personal and professional experiences in life. To help broaden these experiences and to achieve such competency, a global perspective on nursing should be incorporated into the nursing education program on a graded or non-graded basis.^[4,5] Countries such as South Korea, the United States, and Vietnam are particularly aware of the need to prepare global nursing competencies at an undergraduate level. These countries as well as others throughout the world have been preparing study abroad programs or overseas field practice experiences in collaboration with overseas partner institutions, or have created combined global health nursing programs in partner countries.^[6] However, education programs in nursing colleges throughout South Korea are often operated as unidirectional programs rather than bidirectional ones when collaborating with overseas educational institutions for building competency in global health nursing.^[7] Moreover, providing an adequate educational environment for enhancing global health nursing competency, it will not only enhance students’ self-efficacy, but also serve as a method of promoting the substantiality of nursing education programs in general.^[8–10]

The development of global nursing education programs requires a multi-directional approach. Curricular content needs to cultivate a deeper understanding among students regarding public health care systems, insurance-related legislation, health management in individual countries, and international public health organizations by gathering students from collaborating colleges via global institutional networks. In addition, developmental efforts on the content of such programs must involve applying a learning model based on program objectives, creating core content pertaining to global nursing, and accounting for the characteristics of both the program and students.^[11] Most existing global nursing education programs involve multinational joint operation and participation and are short-term, *i.e.*, span for 3 to 4 weeks.^[12,13]

Literature review

In a literature review related to research on global nursing education programs conducted with foreign colleges, programs were found to have been developed with the goal of

enhancing students’ cultural competency through cultivating their knowledge and attitudes.^[9] Some studies measured the outcomes of these programs by developing specialized work related to the program for students or by measuring their personal development and understanding levels; however, in the majority of studies, the measured outcome was “understanding of culture or cultural competency”.^[12,14,15] In addition, the nature of global nursing education in overseas programs allows only a small percentage of students to participate. Given this inherent limitation in participants, the methodology of such studies is often difficult to design. Therefore, numerous studies have employed a qualitative approach or a combination of qualitative and quantitative approaches to examine program outcomes.^[7,16,17] This can be interpreted as resulting from interest in the global nursing field being raised to a relatively higher level through overseas program participation. This is similar to preceding study results that indicated that students’ understanding of culture and cultural competency were enhanced through participation in overseas study programs for global health nursing competence.^[18]

Several articles look to integrate cultural competence into the nursing curriculum in a systematic and formalized manner. The goal of these models is to provide a systematic approach to evaluating global health experiences. One researcher calls for adoption of a model designed to include global health content and specific program characteristics that will lead to evaluation of global experiential education, both locally and internationally.^[19] Another model focuses on the tenets of advocacy, activism, and professional accountability in preparing for global health leaders and nursing education partnerships that lead to cultural competency.^[20] Yet another calls for the development of a “Nursing Supercourse” in global education.^[21] This proposal suggests a virtual lecture-ship on global health education, educating nursing students around the world in their own languages to develop clinical expertise and cultural competency.

At the same time, it is difficult to find examples of global health nursing programs being developed according to empirical investigations of educational needs, which can be done by identifying the gap between the students’ current knowledge and the knowledge they require to graduate. In other words, educational needs represent the discrepancy between “what should be” and “what is”. Using this concept, Borich^[22] in 1980, developed Borich’s Needs Assessment Model. This model helps determine the difference between individuals required competence levels and their present competence level for target goals in an education program. Currently, Borich’s model is widely used in educational needs studies in diverse academic fields, including education and engineering and results from these studies are used in the

development of effective educational programs.^[23–27]

In terms of global health nursing competency models, Wilson *et al.*^[5] modified the instrument developed by the Association of Faculties of Medicine of Canada Resource Groups on Global Health and the Global Health Education Consortium. This instrument assesses global public health competency in the nursing field in terms of six categories^[5] and was shown to have Cronbach's alphas of 0.81 to 0.96 for each of the six areas.

The first step to realizing the development and operation of global health nursing programs can be realistically initiated among partner universities in different countries. One of the researchers involved in the present study, Kang, worked during the study period in a Korean private university; this university has been in a partnership with a state university in the United States since 2006, and recently forged a collaborative relationship with a national university in Vietnam. Faculty members of these universities have considered cooperatively initiating a global health nursing program in the form of a non-credit or two-credit course to ensure that students obtain global health nursing competency.

The purpose of this explorative study was to identify undergraduate nursing students' perceived competency levels—both current and required—in global health nursing and to prioritize content need during program development. The detailed objectives are as follows: (1) describe respondents' demographic characteristics; (2) identify respondents' perceived present and required competency levels; and (3) identify the discrepancy in scores between present and required competency levels and determine differences in scores by country, sex, and prior experience.

2. METHOD

2.1 Research design

The study utilized an exploratory descriptive survey that was led by three faculty at three different international schools of nursing, South Korea, Vietnam and the United States.

2.2 Subject characteristics

The inclusion criterion of this study was being a nursing student interested in participating in a global health nursing program in order to improve global health nursing competency.

2.3 Sampling procedures

Undergraduate nursing students in different countries were targeted. These students were randomly selected from the partnership universities in Vietnam, the United States, and South Korea according to their awareness of global nursing

program and their interest in creating a global health nursing program among these universities. First, notices explaining the study purpose were given to students, regardless of their year in school, by researchers in the nursing program of each university. All participants received explanations from the professor in charge of the study at their respective universities and gave their voluntary consent to participate. Furthermore, the institutional review board of the University of South Korea reviewed and approved the method of participant selection for this study, finding no violation of bioethical guidelines.

2.3.1 Sample size, power, and precision

In terms of the required sample size, a total of 135 participants was derived using the G*Power sample size calculation program. This sample size was determined for an ANOVA with three independent groups, using a significant level of .05, a statistical power of 80%, and an effect size of .25 (which indicates a moderate effect for an ANOVA). To accommodate dropouts, a minimum of 50 participants had to be recruited from each country.

2.3.2 Measures and covariates

Data were collected using a questionnaire modified by the researchers from the instrument developed by Wilson *et al.* (2012). After obtaining permission from the developers to use the lists of global health competencies, these lists were used to assess the perception of nursing students with Borich's method.

3. RESULTS

There were 192 participants in this study. As shown in Table 1, 173 women (90.10%) and 19 men (9.90%) participated; 69 participants (18 men [28.1%] and 51 women [73.9%]) were American, while 61 (all women) were Vietnamese and 62 (1 man and 61 women [98.4%]) were Korean. Questionnaires were collected at the end of the semester between November 20 and December 20 in Vietnam and South Korea, and March 30 in America.

Table 1. Demographic characteristics of the participants

Variable		N	%
Gender	Male	19	9.90
	Female	173	90.10
Overseas educational experience	No	173	90.10
	Yes	19	9.90
Nationality	USA	69	35.94
	Vietnam	61	31.77
	Korea	62	32.29

Educational needs for global health nursing competency by

country were analyzed using Borich's model. The global health nursing education needs of undergraduate nursing students in three countries were measured to calculate the mean weighted discrepancy scores.^[28] Borich's method of calculating students' perceived educational needs is such that greater educational needs are present when the required competency level for a specific item is higher than the student's present competency level for that same item.

First, rankings of Borich's needs scores for each variable by country are listed in Table 2. The variables in the globalization of health and health care category were highly ranked among respondents from South Korea and the United States; however, of the variables for cases who have gone traveling or have foreign birthplaces, "recognizing the patient is at risk for rare diseases or rare presentations of common diseases and ability to make an appropriate assessment or referral" was highly ranked in respondents from Vietnam.

Total differences between present and required competency levels of global health nursing competency are shown in Table 3. The scores on Borich's discrepancy were high for "demonstrating the ability to adapt clinical skills and practice in a resource-constrained setting", and "describing the role of syndromic management and clinical algorithms for treatment of common illness".

Regarding Borich's needs scores for variables in each category, each country had different highest and lowest scores, as shown in Table 4. Among the 30 variables with the highest scores were IVa (4.68 ± 0.59) in the United States, IIb (3.17 ± 0.20) in Vietnam, and IVd (5.52 ± 0.49) in South Korea. Variables with the lowest scores were VIa (1.81 ± 0.23) in the United States, Ia (1.47 ± 0.09) and IIIc (1.47 ± 0.09) in Vietnam, and IIIa (2.20 ± 0.20) in South Korea. Educational needs in South Korea were the highest, followed by the United States, with Vietnam showing the lowest educational needs. Significant differences in educational needs between countries were observed ($p < .001$).

The present competency level differences between countries were mostly statistically significant ($p < .05$), save for the following items: I-a, I-b, II-e, III-d, and V-f. Additionally, the required competency level differences among countries that were statistically significant ($p < .05$) were as follows: I-a, I-b, II-a, II-b, II-c, II-d, II-e, III-a, III-b, III-c, IV-a, IV-c, IV-d, IV-f, V-b, V-d, and VI-b. A post-hoc test showed that most items were the same between the United States and South Korea, while both differed from Vietnam (see Table 5).

Educational needs between those with and without overseas study experience were significantly different ($p < .05$) as shown in Tables 6 and 7, with participants with overseas

study experience having higher needs scores. The countries in which the students had participated in overseas studies were diversely distributed, ranging from underdeveloped to advanced countries. The students were asked to write freely about what they had experienced in their global-health-nursing-related studies and what they wished for if future similar programs were developed. The number of respondents was relatively low, but the responses were very meaningful: students reported desires for the opportunity for global health nursing education, to understand global health needs, and to be able to adapt clinical skills in resource-constrained settings.

4. DISCUSSION

Based on the results of the present study, the educational needs by country for competencies pertaining to globalization of health and health care knowledge in developing countries were highest in the United States, followed by Vietnam and then South Korea. Students' educational needs for a global health nursing program should be met using well-planned educational needs surveys, which can provide a basic framework for guaranteeing good educational effects. In this study, educational needs were high for "demonstrating the ability to adapt clinical skills and practice in a resource-constrained setting", suggesting that the nursing students in our universities perceive themselves as encompassing both global and national communities.

All three nursing programs were four-year bachelor's programs, and improvement in global health nursing competency was one of these nursing programs' educational objectives. However, there were clear differences in the programs' highest and lowest educational needs.

Among the responses, the items with the lowest educational needs scores were "addressing human rights in health care" (1.81 ± 0.23) in the United States, as shown in Tables 2 and 4. The details reveal that nursing students from the United States had sufficient prior learning in areas of human rights; thus, it is understandable that, in the context of global health and human rights relationships, their present and required competency levels did not show major differences. In the case of Vietnam, present competency levels were low with regard to "disease morbidity and mortality", which represent important global health and nursing issues along with disease ranking. However, Vietnamese nursing students' perceived required competency level for this item was assessed as moderate, which led the educational needs to be assessed as low. Thus, it would appear that Vietnamese nursing students' areas of interest in global health issues were limited to specific regions and did not extend to fully cover global health and nursing.

Table 2. Educational needs by rank

Category	Variable	America	Vietnam	Korea
I. Global burden of disease	a. Describe the major causes of morbidity and mortality around the world and how the risk of disease varies with regions	14	30	24
	b. Describe major public health efforts to reduce disparities in global health (such as Millennium Development Goals and Goals Fund to Fight AIDS, TB, and malaria)	9	14	26
	c. Discuss priority setting, health care rationing, and funding for health and health-related research	10	2	9
II. Health implications of migration, travel, and displacement	a. Demonstrate an understanding of the health risks posed by international travel or foreign birth	21	21	16
	b. Recognize when travel or foreign birth places a patient at risk for unusual diseases or unusual presentation of common diseases and make an appropriate assessment or referral	19	1	22
	c. Describe how cultural context influences perceptions of health and diseases	25	18	23
	d. Elicit individual health concerns in a culturally sensitive manner	28	7	14
	e. Communicate effectively with patients and families using a translator	24	25	25
	f. Identify world regions and/or travel activities associated with increased risk of life-threatening diseases including HIV/AIDS, malaria, and multidrug-resistant tuberculosis	22	24	15
III. Social and environmental determinants of health	a. Describe how social and economic conditions such as poverty, education, and lifestyles affect health and access to health care	27	20	30
	b. List major social determinants of health and their impact on differences in life expectancy between and within countries	13	27	10
	c. Describe the impact of low income, education, and communication factors on access to and quality of health care	25	29	29
	d. Describe the relationship between environmental degradation and human health	17	26	28
	e. Describe the relationship between access to clean water, sanitation, food, and air quality, and individual and population health	29	23	27
IV. Globalization of health and health care	a. Analyse how global trends in health practice, commerce and culture, and multinational agreements contribute to the quality and availability of health and health care locally and internationally	2	19	3
	b. Describe different national models or health systems for provision of health care and their respective effects on health and healthcare expenditure	3	17	8
	c. Analyse how travel and trade contributes to the spread of communicable and chronic diseases	23	22	12
	d. Analyse general trends and influences in the global availability and movement of healthcare workers	11	16	1
	e. Describe national and global healthcare worker availability and shortages	5	13	4
	f. Describe the most common patterns of healthcare workers' migrations and their impact on healthcare availability in the country that the healthcare worker leaves and the country to which he or she migrates	1	10	17
V. Healthcare in low-resource settings	a. Articulate barriers to health and healthcare in low-resource settings locally and internationally	18	15	13
	b. Demonstrate an understanding of cultural and ethical issues in working with disadvantaged populations	20	5	19
	c. Demonstrate the ability to adapt clinical skills and practice in a resource-constrained setting	6	9	7
	d. Identify signs and symptoms for common major diseases that facilitate nursing assessment in the absence of advanced testing often unavailable in low-resource settings (cardiovascular disease, cancer, and diabetes)	15	12	6
	e. Describe the role of syndromic management and clinical algorithms for treatment of common illnesses	4	6	2
	f. Identify clinical interventions and integrated strategies that have been demonstrated to substantially improve individual and/or population health in low-resource settings (e.g., immunization, essential drugs, maternal child health programs)	12	4	18
	g. For students who participate in electives in low-resource settings outside their home situations, a demonstration that they have participated in training to prepare for this selective	7	28	5
VI. Health as a human right and development resource	a. Demonstrate a basic understanding of the relationship between health and human rights	30	11	11
	b. Demonstrate familiarity with organizations and agreements that address human rights in healthcare and medical research	16	3	20
	c. Describe the role of WHO in linking health and human rights, the Universal Declaration of Human rights, International Ethical Guidelines for Biomedical Research Involving Human Subjects, Declaration of Helsinki	5	8	21

Table 3. Differences between present and required competency level of global nursing competency

Variable		PCL				RCL				Borich's Index	Borich's Ranking	paired-test (PCL-RCL)	
		Min	Max	Mean	SD	Min	Max	Mean	SD			<i>t</i>	<i>p</i>
I. Global burden of disease	a	1	4	2.62	0.73	1	4	3.41	0.54	2.7	27	14.220	< .001
	b	1	4	2.46	0.70	1	4	3.42	0.60	3.27	17	16.503	< .001
	c	1	4	2.43	0.78	1	4	3.58	0.56	4.1	3	18.821	< .001
II. Health implications of migration, travel and displacement	a	1	4	2.44	0.82	0	4	3.33	0.68	2.95	23	12.948	< .001
	b	0	4	2.46	0.73	1	4	3.42	0.58	3.3	16	17.859	< .001
	c	1	4	2.72	0.75	2	4	3.52	0.55	2.78	25	15.186	< .001
	d	0	4	2.54	0.87	0	4	3.43	0.66	3.05	21	16.210	< .001
	e	1	4	2.84	0.75	2	4	3.59	0.55	2.71	26	13.014	< .001
	f	1	4	2.68	0.73	1	4	3.54	0.59	3.02	22	16.530	< .001
III. Social and environmental determinants of health	a	1	4	2.95	0.66	2	4	3.61	0.57	2.37	29	14.111	< .001
	b	1	4	2.49	0.69	2	4	3.45	0.56	3.31	14	17.525	< .001
	c	1	4	2.96	0.68	2	4	3.60	0.54	2.29	30	13.085	< .001
	d	0	4	2.82	0.76	0	4	3.61	0.59	2.84	24	13.734	< .001
	e	1	4	2.99	0.74	2	4	3.70	0.48	2.6	28	13.882	< .001
IV. Globalization of health and health care	a	1	4	2.10	0.68	1	4	3.31	0.63	4	5	22.096	< .001
	b	1	4	2.16	0.71	0	4	3.30	0.62	3.78	8	19.251	< .001
	c	1	4	2.49	0.75	2	4	3.39	0.60	3.06	20	15.304	< .001
	d	1	4	2.21	0.74	1	4	3.35	0.64	3.8	7	17.844	< .001
	e	0	4	2.19	0.73	0	4	3.39	0.71	4.04	4	19.042	< .001
	f	1	4	2.17	0.71	2	4	3.31	0.58	3.78	8	20.713	< .001
V. Health care in low-resource settings	a	1	4	2.49	0.72	1	4	3.46	0.62	3.36	13	18.386	< .001
	b	1	4	2.40	0.71	1	4	3.34	0.59	3.15	18	18.020	< .001
	c	1	4	2.45	0.75	2	4	3.63	0.55	4.25	2	20.718	< .001
	d	1	4	2.50	0.77	1	4	3.57	0.59	3.83	6	18.528	< .001
	e	1	4	2.21	0.76	1	4	3.45	0.66	4.30	1	22.376	< .001
	f	1	4	2.45	0.69	1	4	3.48	0.61	3.59	12	19.968	< .001
	g	1	4	2.32	0.83	1	4	3.42	0.66	3.76	10	19.282	< .001
VI. Health as a human right & development resource	a	1	4	2.77	0.77	0	4	3.62	0.58	3.07	19	14.682	< .001
	b	1	4	2.40	0.72	1	4	3.38	0.60	3.31	14	20.230	< .001
	c	1	4	2.46	0.83	0	4	3.50	0.69	3.65	11	18.710	< .001

On the other hand, in South Korea, students' present competency level for the item, "explain how socioeconomic factors, such as poverty, education, and lifestyle, affect accessibility to public health", was almost equal to the required competency level. These results were perhaps due to the unique and multicultural socioeconomic and cultural environment of South Korea.

In particular, Vietnamese students were highly in need of improvement of their knowledge and understanding of the health implications of migration, travel, and displacement, especially in recognizing a patient at risk for rare diseases

or rare presentations of common disease. This can be explained in part by the fact that Vietnam is a socialist country with relatively limited freedom of residence and movement, which does not apply to the other two countries in this study. Furthermore, Vietnamese students had little need of improvement in knowledge and understanding of the socioeconomic determinants of health, such as "describing how socioeconomic factors such as poverty, education, and lifestyles affect health and access to health care". This is perhaps because Vietnamese students, living in a socialist system, cannot easily determine which health care services or education to obtain except those who live in Ho Chi Minh City, wherein a

free economy operates as special governance.

Respondents from the United States and South Korea had similar educational needs. In the former, students' needs were mainly in the globalization of health and health care, particularly in describing the most common patterns of health care workers' migrations and their impact on health care availability. In contrast, in the latter, needs relate to analyzing general trends and influences in the global availability and movement of health care workers. These results are doubtlessly influenced by these countries' global work recruitment and students' overseas job-seeking efforts, and students' exposure to multicultural families and populations in their daily lives.

Although previous studies did not investigate needs associated with global health nursing competency in undergraduate nursing students, it can be interpreted from the results of such studies,^[17] that the interest in global health and global health nursing educational needs of underdeveloped countries would be relatively high. Moreover, only slight differences in the education needs for global health nursing in other variables were seen between the studied countries. This finding can be interpreted as resulting from educational environments that allow students easy access to diverse foreign students inside their own communities without having to participate in overseas studies as well as the possibility for easy participation in overseas study.

Table 4. Differences in educational needs among America, Vietnam, and Korea

Variable	America						Vietnam						Korea					
	PCL*		RCL**		Borich's needs		PCL*		RCL**		Borich's needs		PCL*		RCL**		Borich's needs	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
I-a	2.59	0.79	3.57 [†]	0.53	3.37	0.42	2.77	0.72	3.21 [‡]	0.52	1.47	0.09	2.50	0.65	3.44 ^{†,‡}	0.53	3.26	0.29
I-b	2.38	0.86	3.57 [†]	0.53	4.13	0.52	2.46	0.59	3.20 [‡]	0.57	2.46	0.15	2.55	0.59	3.47 [‡]	0.65	3.21	0.29
I-c	2.38 ^{†,‡}	0.75	3.54	0.63	4.03	0.50	2.69 [†]	0.70	3.61	0.49	3.06	0.19	2.24 [‡]	0.82	3.60	0.56	4.73	0.42
II-a	2.68 ^{†,‡}	0.80	3.51 [†]	0.80	2.87	0.36	2.46 [†]	0.72	3.13 [‡]	0.53	2.24	0.14	2.16 [‡]	0.87	3.32 ^{†,‡}	0.62	4.05	0.36
II-b	2.74 [†]	0.72	3.62 [†]	0.55	3.07	0.38	2.25 [‡]	0.62	3.20 [‡]	0.51	3.17	0.20	2.35 ^{†,‡}	0.75	3.42 ^{†,‡}	0.62	3.71	0.33
II-c	3.09 [†]	0.66	3.75 [†]	0.47	2.32	0.29	2.56 [‡]	0.79	3.26 [#]	0.54	2.35	0.15	2.48 [‡]	0.65	3.50 [‡]	0.54	3.55	0.32
II-d	3.04 [†]	0.78	3.68 [†]	0.65	2.22	0.28	2.21 [‡]	0.76	3.03 [‡]	0.58	2.73	0.17	2.29 [‡]	0.82	3.53 [†]	0.56	4.33	0.39
II-e	2.96	0.79	3.70	0.58	2.57	0.32	2.87	0.64	3.46	0.56	1.97	0.12	2.68	0.78	3.61	0.49	3.26	0.29
II-f	2.87 [†]	0.66	3.67	0.56	2.77	0.35	2.87 [†]	0.62	3.46	0.53	1.97	0.12	2.29 [‡]	0.76	3.47	0.65	4.11	0.37
III-a	3.16 [†]	0.63	3.81 [†]	0.39	2.27	0.28	2.67 [‡]	0.68	3.36 [‡]	0.68	2.29	0.14	3.00 [†]	0.57	3.63 [†]	0.52	2.20	0.20
III-b	2.67 [†]	0.74	3.65 [†]	0.48	3.42	0.43	2.59 [†]	0.56	3.15 [‡]	0.57	1.86	0.12	2.21 [‡]	0.68	3.53 [†]	0.50	4.62	0.41
III-c	3.10 [†]	0.57	3.78 [†]	0.45	2.37	0.30	3.00 [‡]	0.61	3.44 [‡]	0.59	1.47	0.09	2.77 [‡]	0.82	3.55 [‡]	0.53	2.70	0.24
III-d	2.72	0.75	3.62	0.67	3.12	0.39	2.98	0.65	3.56	0.53	1.91	0.12	2.77	0.86	3.65	0.55	3.04	0.27
III-e	3.16 [†]	0.66	3.74	0.47	2.01	0.25	3.08 [†]	0.74	3.70	0.49	2.08	0.13	2.73 [‡]	0.77	3.65	0.48	3.21	0.29
IV-a	2.10 ^{†,‡}	0.62	3.45 [†]	0.63	4.68	0.59	2.34 [†]	0.66	3.03 [‡]	0.60	2.29	0.14	1.85 [‡]	0.67	3.42 [†]	0.56	5.46	0.49
IV-b	2.06 [‡]	0.76	3.38	0.81	4.58	0.57	2.51 [†]	0.62	3.21	0.49	2.35	0.15	1.92 [‡]	0.58	3.31	0.46	4.84	0.43
IV-c	2.84 [†]	0.70	3.64 [†]	0.54	2.77	0.35	2.44 [‡]	0.70	3.07 [‡]	0.54	2.08	0.13	2.15 [‡]	0.70	3.44 [†]	0.59	4.50	0.40
IV-d	2.28 [‡]	0.76	3.39 ^{†,‡}	0.71	3.88	0.49	2.48 [†]	0.65	3.18 [‡]	0.62	2.35	0.15	1.89 [‡]	0.68	3.47 [†]	0.53	5.52	0.49
IV-e	2.09 [‡]	0.80	3.36	0.92	4.43	0.56	2.61 [†]	0.56	3.36	0.61	2.51	0.16	1.90 [‡]	0.62	3.44	0.50	5.35	0.48
IV-f	1.94 [‡]	0.73	3.39 [†]	0.71	5.04	0.63	2.36 [†]	0.63	3.13 [‡]	0.46	2.57	0.16	2.24 ^{†,‡}	0.72	3.40 [†]	0.49	4.05	0.36
V-a	2.62 [†]	0.79	3.52	0.72	3.12	0.39	2.69 [†]	0.56	3.41	0.59	2.40	0.15	2.16 [‡]	0.66	3.45	0.53	4.50	0.40
V-b	2.65 [†]	0.76	3.54 [†]	0.70	3.07	0.38	2.34 [‡]	0.60	3.18 [‡]	0.47	2.79	0.18	2.16 [‡]	0.66	3.27 [‡]	0.52	3.88	0.35
V-c	2.39 [‡]	0.75	3.65	0.61	4.38	0.55	2.89 [†]	0.55	3.66	0.51	2.57	0.16	2.10 [‡]	0.72	3.56	0.50	5.12	0.46
V-d	2.71 [†]	0.86	3.68 [†]	0.61	3.37	0.42	2.64 [†]	0.63	3.39 [‡]	0.61	2.51	0.16	2.13 [‡]	0.66	3.63 ^{†,‡}	0.52	5.23	0.47
V-e	2.10 [‡]	0.81	3.42	0.83	4.58	0.57	2.64 [†]	0.58	3.46	0.59	2.73	0.17	1.90 [‡]	0.67	3.48	0.50	5.52	0.49
V-f	2.45	0.80	3.52	0.66	3.73	0.47	2.54	0.67	3.43	0.59	2.95	0.19	2.37	0.58	3.50	0.59	3.94	0.35
V-g	2.19 [‡]	0.81	3.41	0.77	4.23	0.53	2.95 [†]	0.62	3.49	0.62	1.80	0.11	1.85 [#]	0.65	3.37	0.55	5.29	0.47
VI-a	3.13 [†]	0.78	3.65	0.64	1.81	0.23	2.82 [‡]	0.62	3.57	0.56	2.51	0.16	2.32 [#]	0.67	3.63	0.55	4.56	0.41
VI-b	2.59 [†]	0.75	3.55 [†]	0.70	3.32	0.42	2.20 ^{†,‡}	0.65	3.08 [‡]	0.46	2.95	0.19	2.39 [‡]	0.69	3.48 [†]	0.50	3.83	0.34
VI-c	2.28 [‡]	0.92	3.49	0.85	4.23	0.53	2.74 [†]	0.66	3.52	0.57	2.62	0.17	2.39 ^{†,‡}	0.82	3.48	0.59	3.83	0.34

* PCL differences among counties were done by ANOVA: $p < .05$, Duncan grouping test: $^{\dagger}>^{\ddagger}>^{\#}$;

** RCL differences among counties were done by ANOVA: $p < .05$, Duncan grouping test: $^{\dagger}>^{\ddagger}>^{\#}$.

Table 5. Scheffe test for differences in educational needs by nation

	Variable	PCL				RCL			
		America	Vietnam	Korea		America	Vietnam	Korea	
I. Global burden of disease	a				0.112	b	a	a, b	0.001
	b				0.377	b	a	b	0.001
	c	a, b	a	b	0.004				0.742
II. Health implications of migration, travel and displacement	a	a, b	a	b	0.001	b	a	a, b	0.007
	b	b	a	a,b	0.000	b	a	a, b	0.000
	c	b	a	a	0.000	c	a	b	0.000
	d	b	a	a	0.000	b	a	b	0.000
	e				0.098				0.048
	f	a	a	b	0.000				0.070
III. Social and environmental determinants of health	a	b	a	b	0.000	b	a	b	0.000
	b	a	a	b	0.000	b	a	b	0.000
	c	b	a	a	0.020	b	a	a	0.001
	d				0.126				0.690
	e	b	b	a	0.002				0.536
IV. Globalization of health and health care	a	a, b	a	b	0.000	b	a	b	0.000
	b	b	a	b	0.000				0.320
	c	b	a	a	0.000	b	a	b	0.000
	d	b	a	b	0.000	a, b	a	b	0.034
	e	b	a	b	0.000				0.796
	f	b	a	a, b	0.002	b	a	b	0.013
V. Health care in low-resource settings	a	a	a	b	0.000				0.584
	b	b	a	a	0.000	b	a	a	0.001
	c	b	a	b	0.000				0.573
	d	a	a	b	0.000	b	a	a, b	0.014
	e	b	a	b	0.000				0.858
	f				0.397				0.658
	g	b	a	c	0.000				0.580
VI. Health as a human right & development resource	a	b	a	c	0.000				0.741
	b	b	a, b	a	0.006		a	b	0.000
	c	b	a	a, b	0.004				0.942

Table 6. Overseas training experience by nationality

	America (n = 10)		Vietnam (n = 2)		Korea (n = 7)		Total (n = 19)	
	n	%	n	%	n	%	n	%
Nepal	1	10.0	0	0.0	0	0.0	1	5.26
Jamaica	1	10.0	0	0.0	0	0.0	1	5.26
Jordan	1	10.0	0	0.0	0	0.0	1	5.26
Spain	1	10.0	0	0.0	0	0.0	1	5.26
Tanzania	1	10.0	0	0.0	0	0.0	1	5.26
Southeast Asia	1	10.0	0	0.0	0	0.0	1	5.26
Italy	1	10.0	0	0.0	0	0.0	1	5.26
Finland	0	0.0	2	100.0	0	0.0	2	10.52
Thailand	0	0.0	0	0.0	3	42.8	4	21.10
Philippines	0	0.0	0	0.0	2	28.6	2	10.52
America	0	0.0	0	0.0	2	28.6	1	5.26
None	3	30.0	0	0.0	0	0.0	3	15.78

Table 7. Differences in educational needs by overseas training experience

Variable		PCL						RCL					
		Yes (n = 19)		No (n = 173)		<i>t</i> -test (oversea' study experience)		Yes (n = 19)		No (n = 173)		<i>t</i> -test (oversea' study experience)	
		Mean	SD	Mean	SD	<i>t</i>	<i>p</i>	Mean	SD	Mean	SD	<i>t</i>	<i>p</i>
I. Global burden of disease	a	2.89	0.81	2.59	0.71	-1.743	.083	3.53	0.51	3.40	0.55	-0.970	.333
	b	2.68	0.89	2.43	0.68	-1.197	.245	3.53	0.51	3.40	0.61	-0.839	.402
	c	2.53	0.70	2.42	0.79	-0.555	.579	3.58	0.51	3.58	0.57	-0.007	.995
II. Health implications of migration, travel and displacement	a	2.74	0.73	2.41	0.83	-1.649	.101	3.63	0.50	3.29	0.69	-2.067	.040
	b	2.53	0.96	2.45	0.70	-0.427	.670	3.58	0.61	3.40	0.58	-1.240	.217
	c	3.16	0.60	2.68	0.75	-2.714	.007	3.74	0.45	3.49	0.56	-2.191	.038
	d	3.05	0.71	2.48	0.87	-3.280	.003	3.63	0.60	3.40	0.66	-1.429	.155
	e	3.32	0.58	2.79	0.75	-2.974	.003	3.84	0.37	3.57	0.56	-2.871	.008
	f	3.11	0.57	2.64	0.73	-3.318	.003	3.79	0.42	3.51	0.60	-2.643	.014
III. Social and environmental determinants of health	a	3.47	0.70	2.90	0.63	-3.758	.000	3.89	0.32	3.58	0.58	-3.735	.001
	b	2.89	0.94	2.45	0.65	-2.013	.058	3.58	0.51	3.44	0.56	-1.035	.302
	c	3.53	0.51	2.90	0.67	-3.932	.000	3.79	0.42	3.58	0.55	-2.017	.054
	d	3.26	0.81	2.77	0.74	-2.708	.007	3.74	0.45	3.60	0.60	-0.998	.320
	e	3.58	0.51	2.93	0.74	-3.739	.000	3.84	0.37	3.68	0.49	-1.375	.171
IV. Globalization of health and health care	a	2.63	0.60	2.04	0.66	-3.743	.000	3.53	0.51	3.28	0.63	-1.613	.108
	b	2.42	0.77	2.13	0.70	-1.730	.085	3.32	0.95	3.30	0.57	-0.102	.919
	c	2.84	0.83	2.45	0.73	-2.174	.031	3.53	0.70	3.38	0.59	-1.032	.304
	d	2.63	0.76	2.17	0.72	-2.639	.009	3.68	0.58	3.31	0.63	-2.619	.015
	e	2.58	0.69	2.15	0.72	-2.461	.015	3.63	0.60	3.36	0.71	-1.605	.110
	f	2.21	0.79	2.17	0.71	-0.248	.804	3.47	0.70	3.29	0.57	-1.268	.206
V. Health care in low-resource settings	a	2.74	0.81	2.47	0.70	-1.558	.121	3.79	0.42	3.43	0.63	-3.369	.002
	b	2.95	0.78	2.34	0.68	-3.690	.000	3.53	0.51	3.32	0.60	-1.460	.146
	c	2.53	0.84	2.45	0.74	-0.447	.655	3.74	0.45	3.61	0.56	-1.108	.279
	d	2.74	0.81	2.47	0.77	-1.411	.160	3.84	0.37	3.54	0.60	-3.065	.005
	e	2.58	0.69	2.17	0.76	-2.270	.024	3.68	0.48	3.43	0.67	-2.120	.043
	f	2.42	0.69	2.46	0.69	0.212	.832	3.63	0.50	3.47	0.62	-1.102	.272
	g	2.37	0.76	2.32	0.84	-0.251	.802	3.53	0.51	3.41	0.67	-0.727	.468
VI. Health as a human right & development Resource	a	3.16	0.69	2.73	0.77	-2.328	.021	3.95	0.23	3.58	0.60	-5.218	.000
	b	2.95	0.62	2.34	0.70	-3.609	.000	3.74	0.45	3.34	0.60	-2.767	.006
	c	2.58	0.77	2.45	0.84	-0.666	.506	3.74	0.45	3.47	0.70	-1.591	.113

Notably, participants who had taken part in overseas field study had rather high global health nursing education needs. In previous studies, when students' competence level, such as their knowledge or technical capabilities, was perceived as high, their educational needs were rather low.^[24] Interestingly, some variables that were not identified as having high educational needs according to present competency levels were still designated as having high educational need because of their high perceived required competency level. These variables included "global burden of diseases" and "health implications of migration, travel, and displacement". This is perhaps because these areas of global health nurs-

ing competency are approached via both in-situ training and in-class teaching, which have no considerable difference in educational effects. Nevertheless, variables identified as significantly different in terms of required competency level in Table 7 should be included as key content when designing global health nursing programs to better meet students' needs and achieve program outcomes. This would include domestic multicultural family supportive policy experiences, participatory programs for minority families as in-situ training, internship training in specific projects operated outside of students' own country, gathering together students to discuss or hear special lectures on human rights in healthcare, brain-

storming alternatives to nursing interventions in low-resource environments, and presenting and identifying differences and any improvements in the six building blocks of the World Health Organization's health care system among students of different nationalities.

In reality, it is highly impossible to provide overseas study programs for the enhancement of global health nursing competency through tuition paid by students. Research on various ways of financing global health nursing programs has proposed a number of alternative methods for internationalizing student nurses.^[29] In most nursing education programs, overseas study programs are operated through external funding or students bear the cost themselves. Therefore, as an alternative, educational content that students can discuss and experience together for 2 to 3 weeks could be constructed. If several countries form a network and operate global health nursing education programs in each country, effective education outcomes may be achieved.

Limitations

This study was an explorative study to identify students' educational needs in developing three countries' global health nursing programs. The findings have an inherent limitation in generalization, because all respondents were only from partner universities. Further research should focus on assessing students' educational needs in the development of standardized global health nursing programs in any setting.

5. CONCLUSION

This study used Borich's educational needs analysis model to investigate nursing undergraduate students' present and required competency level in global health nursing to identify educational needs to use the information for the development of global nursing program. Many interesting conclusions can be drawn from this research.

Educational needs by country showed that variables pertaining to health care competencies in relation to developing countries were highest in the United States, followed by Vietnam and South Korea. The variables with the highest scores were globalization of health in the United States and South Korea and the health implications of migration in Vietnam. Global health nursing education needs slightly differed be-

tween the three countries. This could be due to differences in the educational environments. Our findings regarding the current needs for global health nursing of undergraduate nursing students in these three countries can be utilized as basic data for the development of global health nursing education programs in which the undergraduate nursing students from all three countries can participate. Educational needs were also shown to be higher in students who participated in overseas field studies in the present study. Furthermore, we can utilize the results as basic data for analyzing the effectiveness of global health nursing education programs developed in the future. Finally, the mere operation of an education program can be used as basic data of the effects (*e.g.*, planned or unintended results) of global health nursing education programs on students with diverse cultural backgrounds.

In the field of nursing, patients of diverse cultural backgrounds are cared for by professional nurses. As such, studies that assist nurses in a broader understanding of patients affect nurses' duties and the development of required educational content for nurses.

In the reality of nursing education, an international strategy for standardizing the undergraduate global health nursing curriculum is needed. Additionally, a mechanism for comparing and contrasting curriculums using global standards recognized by accrediting bodies and organizations, such as the International Council of Nurses, is required. Furthermore, a core curriculum should be designed to direct nursing schools offering international programs to consider cultural differences and define differences in health care systems, societal norms, and environmental complexities that students will encounter abroad. Future studies should examine the similarities and differences that these students might encounter when entering a host country.

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CONFLICTS OF INTEREST DISCLOSURE

No conflict of interest has been declared by the authors.

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