

ORIGINAL RESEARCH

Global Health Career Interest among Medical and Nursing Students: Survey and Analysis



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Abstract

BACKGROUND Global health experiences undertaken in international settings (GHEs) are becoming an increasingly prevalent aspect of health professions education and, as such, merit comprehensive analysis of the impact they have on students and host communities.

OBJECTIVE To assess the associations between demographic/experiential factors and the interest of health professions students in careers involving global health.

METHODS A cross-sectional survey was administered online to a convenience sample of medical and nursing students at Johns Hopkins University. Questions addressed level of interest in a global health career, prior GHEs, and demographic information. Items were either Likert scale or multiple choice. Various regression analyses were performed.

FINDINGS Of 510 respondents, 312 (61.2%) expressed interest in a global health career and 285 (55.9%) had prior GHEs. Multivariate logistic regression found female sex, age ≥ 27 years, household income $< \$100,000/y$, and a prior research-related GHE independently associated with higher interest in global health careers. On subset analysis of participants with one or more prior GHEs: age ≥ 27 years, household income $< \$100,000/y$, a prior research-related GHE, and having multiple GHEs were each independently associated with increased interest in a global health career.

CONCLUSIONS Simply participating in a global health experience abroad is not significantly associated with interest in a global health career. However, sex, age, household income, and research-related GHEs are significantly associated with global health career interest. These findings may inform the development of global health programs at medical and nursing schools and can guide efforts to increase the number of health care professionals entering global health careers.

KEY WORDS career selection, global health, global health training, health care training, international experiences, medical education, medical student, nursing student.

INTRODUCTION

Interest in global health (GH) and participation in international health experiences have increased dramatically in recent decades.¹⁻³ According to a 2015 report, more than 30% of US medical students par-

ticipated in a global health experience in an international setting (GHE) before graduation, and similar increases are believed to have taken place in the nursing student community.³ The benefits and costs of such experiences have been debated. Such benefits include improved physical examination skills

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for participants, development of transnational relationships and intercultural understanding, building foundations for potential future careers in GH and primary care, molding of more socially conscious health care providers, and the provision of labor by students.⁴⁻⁸ The concerns are often focused on the expenses of and resources dedicated to GHEs, which could be put to alternative uses in low- and middle-income countries, and inadequate student preparation that could pose potential risks to host communities and the students themselves.^{9,10}

Research is ongoing regarding the efficacy of harm reduction measures, such as predeparture training before GHEs (A.G. Kironji et al, unpublished data, 2017). In terms of maximizing the long-term positive impacts of GHEs, this may be accomplished if participants are more likely to incorporate global health into their future careers. However, there is little extant literature on the impact that GHEs, specifically those in international settings, have on student interest in GH careers. As such, the primary aim of this study was to assess for associations between GHE participation and student interest in careers involving GH.

METHODS

We performed a cross-sectional, online survey to determine medical and nursing students' interest in a GH career. All full-time medical and nursing students at Johns Hopkins University during academic years 2013-2014 and 2014-2015 received a survey link via a standardized e-mail. We incentivized participation with a raffle for nominal-value gift cards. No unique participant identifiers were obtained, and the study was approved by the Johns Hopkins Hospital Institutional Review Board.

No validated survey tools were available to assess GH career interest at the time of study. As such, our team developed a questionnaire addressing current interest in a GH career, prior GHEs, and demographic information. Interest in a GH career was defined broadly in the questionnaire as "interest in a career in global health or in incorporating global health into your future practice." GHEs were defined as "any experience that addressed global health and was conducted in an international setting." This questionnaire was face validated by a team of medical students, residents in several specialties, attending physicians, and a bioethicist at the Johns Hopkins University School of Medicine, all of whom have experience in GH. The survey ultimately consisted of 41 multiple choice and 5-point Likert scale items.

The complete questionnaire is provided as a supplement.

We administered the survey using Qualtrics (Qualtrics LLC, Provo UT). Duplicate submissions and those in which students failed to answer the primary question (ie, "What is your current level of interest in a career in global health or in incorporating global health into your future practice?") were removed. The primary outcome was interest in a career involving GH, as defined by a Likert score of 4, "interested," or 5, "very interested." Respondents with a Likert score of 1, "very uninterested," 2, "uninterested," or 3, "neutral," were characterized as "not interested." Continuous data were presented as means \pm standard deviation (SD) and compared in the GH "interested" and "not interested" groups using the Wilcoxon rank-sum test. Categorical data were presented as n values with percentages and compared using the χ^2 test. Age 27 years was selected as the cutoff for age dichotomization because (i) it was the median age of respondents and (ii) assuming high school graduation at age 18, "traditional" students who progress directly from college to medical or nursing school within the US system would complete health care training by age 26 at the latest. Thus, the majority of respondents 27 years old or older likely qualify as "nontraditional students," in the sense that they did not proceed directly to graduate school in nursing or medicine. (All Johns Hopkins nursing students must complete a bachelor's degree before admission, thus their health care studies are strictly postgraduate.) Household income of \$100,000/year was selected as the cutoff for household income dichotomization, because it (i) allowed for a relatively even distribution between groups and (ii) has been found by the Urban Institute to be the lower bound for upper-middle class within the United States.¹¹ Eight weeks was selected as the cutoff for dichotomization of the duration of participants' longest GHE because this was the median GHE duration among participants and it is a cutoff used by some in the literature to define "short-term medical service trips."¹²

Unadjusted odds ratios (OR) with 95% confidence intervals (95% CI) were calculated on bivariate analysis comparing covariates and interest in a GH career. Adjusted ORs with 95% CIs were calculated using multivariate logistic regression. These analyses were run on medical and nursing students in aggregate to maximize sample size. A combination of forward and backward stepwise regression was used in the selection of the final model with P value $< .05$ as the criterion for inclusion and P value $\geq .05$ as the criterion for exclusion. Regression models were further modified as needed

Table 1. Demographics (n = 510)				
Variable	Interested in GH (n = 312)	Not Interested in GH (n = 198)	P	Total
Age, mean ± SD	28.0 ± 6.0	26.9 ± 5.4	<.01*	27.6 ± 5.8
Sex, n (%)				
Male	57 (46.7)	65 (53.3)	<.001*	122 (23.9)
Female	255 (65.7)	133 (34.3)		388 (76.1)
Prior Postgraduate Degree, n (%)				
No	252 (59.9)	169 (40.1)	.2	421 (82.5)
Yes	60 (67.4)	29 (32.6)		89 (17.5)
School Affiliation, n (%)				
Nursing school	203 (68.1)	95 (31.9)	*<.001	298 (58.4)
Medical school	109 (51.4)	103 (48.6)		212 (41.6)
Household Income, n (%)				
<\$50K/y	56 (71.8)	22 (28.2)	*.02	78 (20.4)
\$50K-\$99K/y	61 (62.2)	37 (37.8)		98 (25.6)
\$100K-\$149K/y	48 (60.8)	31 (39.2)		79 (20.6)
\$150K-\$199K/y	28 (70.0)	12 (30.0)		40 (10.4)
≥\$200K/y	42 (47.7)	46 (52.3)		88 (23.0)
Intended Specialty (MD Candidates Only), n (%)[†]				
Medical	65 (52.8)	58 (47.2)	.1	123 (61.5)
Surgical	32 (41.6)	45 (58.4)		77 (38.5)

GH, global health; K, 1000 (eg, \$50K = \$50,000); SD, standard deviation.
* $P < .05$.
[†] Medical = emergency medicine, family medicine, internal medicine, medical subspecialties, pediatrics, and psychiatry. Surgical = anesthesiology, general surgery, obstetrics/gynecology, and surgical subspecialties.

based on Hosmer and Lemeshow goodness-of-fit testing and variance inflation factor. Data analysis was performed using Stata Statistical Software: Release 13 (Stata Corp., College Station, TX).

RESULTS

Of the 1333 medical and nursing students who received the survey, 510 (38.3%) provided complete responses (41.6% were medical students, 58.4% were nursing students). The majority of respondents were female (76.1%) and had no prior postgraduate degree (82.5%), and the mean age was 27.6 years (range: 17-61) (Table 1). Household incomes were relatively evenly distributed, with those from households making \$50,000-\$100,000/y being most common (25.6%). Of those in medical school, the preponderance intended to enter a medical specialty (61.5%). Fifty-six percent had 1 or more prior GHE, and 37.2% of those with a GHE had at least 1 such experience during their time as a health professions student. Most participants (61.2%) expressed interest in a career involving GH, and those interested in GH careers were more likely to be female, older, and from households with incomes <\$100,000/y and were nursing students.

On bivariate analysis, in addition to the previously stated demographic factors, another variable significantly associated with GH career interest was having participated in a prior GHE, irrespective of the type of GHE (research, clinical/service, study abroad, international work) (Table 2). However, on multivariate analysis, simply having a prior GHE was no longer statistically significant and the only experiential factor to retain significance was having a research GHE (OR: 2.19; 95% CI: 1.18-4.07). All demographic factors—age (OR: 1.78, 95% CI: 1.13-2.80), sex (OR: 2.02, 95% CI: 1.23-3.30), and household income (OR: 1.96, 95% CI: 1.20-3.23)—remained significantly associated with GH career interest on multivariate analysis.

It is worth noting that school affiliation (ie, nursing school vs medical school) was purposely excluded from this multivariate model. When school affiliation was accounted for in the model, none of the demographic characteristics remained independently associated with GH interest. Compared with medical students, nursing students were significantly more likely to be female, older, and from families with lower income ($P < .001$ for each). Therefore, to avoid collinearity between these demographic characteristics and school affiliation, and to better evaluate for

Table 2. Crude and Adjusted Odds Ratios for Global Health Career Interest, Run Using Data From All Participants (n = 503)

Variable	Crude OR	95% CI	Adjusted OR	95% CI
Sex				
Male		Referent		Referent
Female*	2.14	1.42-3.22	2.02	1.23-3.30
Age				
<27 y		Referent		Referent
≥27 y*	1.51	1.06-2.15	1.78	1.13-2.80
Household Income				
≥\$100K/y		Referent		Referent
<\$100K/y*	1.82	1.14-2.86	1.96	1.20-3.23
Number of GHEs				
0		Referent		Referent
≥1†	3.03	2.10-4.37	1.30	0.59-2.84
Type of GHEs‡				
Research*	4.10	2.51-6.68	2.19	1.18-4.07
Clinical/Service†	3.33	2.24-4.95	1.47	0.75-2.86
Study Abroad†	3.34	1.96-5.69	1.17	0.62-2.22
International job†	3.35	2.02-5.54	1.00	0.54-1.87

CI, confidence interval; GHE, global health experience in an international setting; K, 1000 (eg, \$100K = \$100,000); OR, odds ratio.
 * Covariates with significant association ($P < .05$) with GHEs on bivariate and multivariate regression.
 † Covariates with significant association ($P < .05$) with GHEs on bivariate regression.
 ‡ Each analysis was run using participants with no prior GHE and those with a GHE but not that specific type of GHE as the reference group. Example: reference group for Research consisted of those with no prior GHE and those with prior nonresearch GHEs.

associations between these demographic characteristics and GH interest, school affiliation was excluded from the final multivariate model.

To assess for specific GHE characteristics that may lead to greater GH career interest, we excluded participants with no prior GHE and ran regression analyses solely on data from respondents with at least one prior global health experience (Table 3). Bivariate analysis of this subset found that age ≥27 years, household income <\$100,000/y, having 2 or more GHEs, and having a research GHE were significant for increased GH career interest. Each of these factors retained significance on multivariate analysis: age ≥27 years (OR: 1.80, 95% CI: 1.08-3.01), household income <\$100,000/y (OR: 2.22, 95% CI: 1.16-4.35), more than 1 GHE (OR: 2.45, 95% CI: 1.45-4.15), and prior research GHE (OR: 1.70, 95% CI: 1.01-2.84). No other covariates attained either dependent or independent significance.

DISCUSSION

In our survey of health professions students, 61.2% were interested in a career involving GH and 59.3% had participated in at least 1 prior global health experience in an international setting. Interestingly, simply having participated in a GHE was not independently associated with GH career interest. Instead,

the only experiential factor independently associated with GH career interest was participation in a research GHE. Various demographic factors—namely, female sex, age ≥27 years, and household income <\$100,000/y—were also independently associated with increased interest in a GH career. The findings were similar on subset analysis using only data from participants with at least 1 prior GHE: age, household income, and participation in a prior research GHE remained independently associated with GH career interest, although sex was no longer significant. This subanalysis found participation in multiple GHEs rather than just 1 to also be significantly associated with interest in a GH career.

Participation in a research GHE was the only experiential factor independently associated with GH career interest. This aligns with findings from research by the Fogarty International Clinical Research Scholars and Fellows in which median GH career interest scores increased during the research fellowship and remained elevated after training. Interestingly, for that population, post-training interest in a GH career was not influenced by level of interest in GH before the fellowship period.^{13,14} Thus, this suggests that in terms of causality, participants' involvement in research GHEs actively increased their interest in GH careers, rather than that this GH career interest was simply determined by interest in GH at

Table 3. Crude and Adjusted Odds Ratios for Global Health Interest, Run Using Data Only From Participants With ≥1 Prior GHE (n = 285)

Variable	Crude OR	95% CI	Adjusted OR	95% CI
Sex				
Male		Referent		Referent
Female	1.40	0.78-2.53	—	—
Age				
≤26 y		Referent		Referent
>26 y*	1.80	1.08-3.01	2.23	1.18-4.20
Household Income				
≥\$100K/y		Referent		Referent
<\$100K/y*	2.22	1.16-4.35	2.63	1.30-5.26
No. of GHEs				
1		Referent		Referent
≥2*	2.45	1.45-4.15	2.19	1.18-4.05
Duration of Longest GHE				
≤8 wk		Referent		Referent
>8 wk	1.38	0.84-2.28	—	—
Types of GHEs†				
Research*	1.70	1.01-2.84	2.25	1.11-3.63
Service/clinical	1.52	0.88-2.65	—	—
Study abroad	1.18	0.68-2.03	—	—
International job	1.19	0.71-2.01	—	—

CI, confidence interval; GH, global health; GHE, global health experience in an international setting; K, 1000 (eg, \$100K = \$100,000); OR, odds ratio.
* Covariates with significant association ($P < .05$) with GHE on bivariate and multivariate regression.
† Regression analyses were run comparing those who had that specific GHE type vs. those with a GHE but not that specific type of GHE.

baseline. However, this does not rule out the possibility that students with interest in such careers at baseline are also more inclined to participate in GH research abroad. Our finding also suggests there may be something unique to research experiences that is not found in other GHEs. This could be that developing and executing research often involves more independent and in-depth grappling with GH issues than participation in clinical work, study abroad, or international jobs, which often have predefined curricula or tasks. With most students (64.9%) undertaking their GHE before entering medical or nursing school, they may have also felt better able to contribute to research projects than to, say, a clinical GHE.

Older students (age ≥27) were also more likely to have an interest in GH careers. This may be due to older students being more likely to have traveled abroad, explored foreign languages, or otherwise cultivated personal interests related to GH before enrolling in medical or nursing school. However, this finding contrasts with another study wherein increasing age was associated with decreasing GH interest.¹⁵ The difference in these findings may result from population differences—Nathan et al¹⁵ studied OB/GYN residents rather than medical/nursing students¹⁶—and it may be that as health care train-

ees progress to these more advanced stages of training, increasing age becomes a restricting factor in one's GH interest because of an increased focus on clinical medicine and career development. Direct comparisons with this study are further limited because their questionnaire addressed interest in a GH elective and perceived GH importance rather than GH career interest.

Other research has found that financial constraints are one of the greatest barriers to participation in GH work.^{1,8,15,17-22} Therefore, it might follow that students from higher income households would be more interested in GH careers, but this is not what we found. Many educational institutions provide funding for students to undertake GHEs, which may have offset the financial burden of GH travel for some students who completed our survey.^{8,16} Also, the so-called global health tax, which suggests that a clinical career involving GH comes with financial and other sacrifices, may also play a role.²¹ For instance, research has found that young adults from wealthier backgrounds feel high levels of "achievement pressures," which in American society is often associated with financial success.²³ In this context, it is possible that students from wealthier families may feel increased pressures to pursue more financially rewarding careers, potentially making this global health

tax more off-putting. However, this is a speculative explanation and further research is warranted.

We also found an association between female sex and GH career interest. Given the overlaps between GH and public health, it seems consistent with findings that student bodies at most schools of public health are predominantly female.^{24,25} Although interesting, we are unable to further explain this association.

Many of the covariates listed here that were independently associated with GH interest among our complete survey population—namely, age, household income, and a prior research GHE—remained so in our subset analysis of only students with at least 1 prior GHE. This consistency further strengthens the notion that these covariates meaningfully correlate with interest in a GH career. Additionally, the independent association in this subset between having multiple GHEs—rather than just 1—and GH career interest is consistent with the previously mentioned study of OB/GYN residents that found GH interest increased cumulatively for every GHE an individual reported.¹⁵ Nevertheless, although participation in multiple GHEs may increase students' GH career interest, it is worth considering that those with greater *a priori* GH interest may also be more inclined to participate in multiple GHEs.

Interestingly, our subset analysis of students with at least 1 previous GHE found no significant association between the duration of students' longest GHE and their interest in a GH career. This is consistent with another study of US medical students, which found that a 1-week trip was sufficient to stimulate students' interest in GH and encourage future longer-term efforts.^{16,26} However, care should be taken when interpreting this finding. Although increasing GHE duration may not translate directly into increased GH interest, GHEs serve various purposes aside from simply stimulating student interest in GH careers. The general consensus among experts is that longer GHEs are preferable to shorter ones so as to minimize negative impacts and maximize positive ones on host communities, to allow greater cultural immersion for students, and to foster stronger relationships between visiting students and host communities.^{12,15,24}

It is worth noting that similar demographic variables—increasing age, lower annual household income, and female sex—have also been associated with increased likelihood of entering a generalist or primary-care career for medical students.²⁷⁻³¹ Several publications have also linked student interest in GH to increased likelihood of pursuing a career in a primary care setting, working with underserved and impoverished populations, or undertaking public health and community service endeavors.^{2,5,17,18,32,33}

One limitation of this study is that we cannot adequately compare differences between medical and nursing students' interests in GH. Although more nursing students expressed interest in GH than medical students (68.1% vs 51.4%, $P < .001$), when we ran regression analyses on nursing- and medical-student cohorts separately, there were no covariates independently associated with GH interest, likely because of the limited sample sizes in each of the respective cohorts. Because there are no widely cited studies comparing medical and nursing students' interests in GH or GHE, this is a worthwhile area of future study, especially because “task shifting” (nonphysicians performing physician-level tasks) is an important strategy to improve access to care in low- and middle-income countries.

Another limitation of our data is a low response rate (510 respondents/1333 invitees). Given that 54.9% of respondents reported a prior GHE (compared with 31.2% of graduating medical students in American Association of Medical Colleges data), it is likely that our findings are subject to selection bias, because (i) students with interest in GH may have been more likely to complete the survey and (ii) applicants with higher GH interest may be more attracted to our institution because of its GH resources and opportunities.³ However, given that our primary intention is to better identify and target students who will go on to pursue GH careers, this bias may not significantly affect the generalizability of our results. Our study is also unable to establish temporality of associations as a result of its cross-sectional format.

CONCLUSIONS

GHEs are becoming an increasingly prevalent aspect of health professions education and, as such, merit comprehensive analysis of the impact they have on students and host communities.¹⁻³ Our findings contribute to the aforementioned debate over the costs and benefits of these experiences that has emerged in recent years. Our findings provide additional arguments for the benefit of research GHEs and student exposure to multiple GHEs. However, care must be taken that global health experiences conducted in developing contexts do not become one-sided interactions between high- and low-resource institutions that make no sustainable impact.^{34,35} We also found that female sex, increased age, and relatively lower household income significantly correlate with GH career interest. As a

whole, these findings may serve to guide design of future global health programs for health professions students and enable more efficient targeting of GH recruitment efforts toward interested populations.

SUPPLEMENTARY DATA

Supplementary data accompanying this article can be found in the online version at [doi:10.1016/j.aogh.2017.07.002](https://doi.org/10.1016/j.aogh.2017.07.002).

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