

Factors Influencing Students' Enrollment in Health Science Majors at Higher Education Institutions in Phnom Penh, Cambodia

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Article Info

Article history:

Received 2023-08-08

Revised 2023-09-09

Accepted 2023-09-09

Keywords:

Cambodia

Factors

Health science majors

Higher education institutions

Undergraduate

ABSTRACT

Health science is crucial for a country's development. It provides healthcare knowledge and skills to health professionals to maintain the quality of health and well-being of its people. Cambodia's healthcare professionals are underrepresented in GDP growth because few students are interested in the health sciences. This study explores factors influencing students' decisions in choosing a health science major in higher education in Cambodia. It is a mixed-method study. Data was collected from the anonymous Google form questionnaire and focus-group discussions (FGDs). The quantitative data were analyzed using SPSS, while the qualitative data were analyzed thematically. The findings showed that tuition fees (38%), specialization courses offered (38%), university modern technology (31.4%), family's decision (29.8%), scholarship opportunity (29.8%), and university locations (24.8%), were the main factors for the participants' choices of their university majors. The theme-based results classified the students' decisions on health science majors into life experiences, role models, family support and engagement, academic performance, and career goals. The results further demonstrated that families, university profiles, and student academic performance played the most important roles in encouraging students' enrollment in health science majors to maintain the quality of the healthcare sector in Cambodia.

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1. INTRODUCTION

Education is considered a foster of human development and is seen by many as the centre of any society's life and concern. It illustrates social symbolism and aspirations about the welfare and development of the society it deems to serve [1]. Providing high-quality education is a priority that every nation strives to include in its national education

goals. Educational institutions must be able to utilize education as a tool for social change [2]. Likewise, the university plays an essential role in students' lives, as it affects their time and money spent on academic performance and instils career values that their university experiences can reflect upon [3]. Enrolling in a major of interest is a powerful motivational tool that encourages learning and guides academic and career paths, leading to academic success [2]. Higher education (HE) is necessary for country development as it can develop valuable human resources in technical skills, social development, poverty alleviation, and attitudes toward sustainable economic growth [4], [5].

Health science is considered the most essential factor in every country. It plays a crucial role in the country's development and provides healthcare knowledge and skills to health professionals to maintain quality public health services and the country's well-being [6]. Studies show that enrollment rises in business-related and social science majors rather than science and health science majors. Approximately $\frac{3}{4}$ of the total enrollment in HE is in business and social science majors, whereas only $\frac{1}{4}$ enrolled in science and health science majors, respectively [7], [8]. Moreover, a report released by the MoEYS in 2021 illustrated that there was a small percentage of enrolments for basic science (5%) and health sciences (5%) compared to business-related majors (42%) and other social science majors (28%) [9]. A similar study by Kao et al. [10] found that 727 among 1338 students switched academic majors. Approximately 93.1% of these 727 students switched from science in upper-secondary school to non-STEM in HE [10]. From these reports, we can conclude that the students may face issues when choosing a university major, including a lack of information, self-interest in the field, aptitude in the field, and the influence of others (friends, parents, spouses, or role models) [11]–[14].

Cambodia has an imbalance between the number of medical professionals and GDP growth (6–8%) [15]. Cambodia still needs experts in the health sciences, according to the Ministry of Health's Projection Plan 2012–2020, which estimates that it needs 35,000 engineers, 46,000 technicians [15], and more than 10,000 experts to keep GDP growth between 6–8% by 2018–2020. To ensure the population widely uses healthcare services, there is a need for nurses (primary nurse: 3508; secondary nurse: 2791); midwives (primary midwife: 538; secondary midwife: 2416); medical doctors (867); specialized doctors (129); physiotherapists (124); and X-ray technicians (212) [16]. Health professionals are primary in providing access to healthcare and quality health delivery, health promotion, and disease treatment and prevention [17].

Several factors and motivations have influenced students in selecting a university major. Students with excellent pre-university academic performance, especially in mathematics and science subjects, tend to select science or health science-related majors. In contrast, those with poorer pre-university academic performance in these subjects tend to select the liberal arts or business-related fields instead [11], [18]. Other students chose a university major because of the availability of various job opportunities, an expectation of a highly paid profession, university and college reputation, the influence of their promotional activities, and the influence of parents, relatives, and friends [11], [19]. Thus, these motivations and influencing factors are vital in developing persistence, achievement, and career aspirations for significant health science students. Comprehending what factors

inspire students to select a health science major is essential. Therefore, this study will examine factors influencing students' decisions in choosing a health science major. The study attempted to ask what factors influence students' decisions on choosing health science majors at higher education institutions (HEI) in Phnom Penh, Cambodia, while the objective was to explore factors that influence students' choice of health science majors for their HE degrees in Cambodia.

2. METHOD

2.1. Research design

This mixed-method study explored students' perceptions of enrolling in a health science major for their HE degree program. We decided to use this method to get in-depth information regarding the factors influencing undergraduates to enrol in a particular health science major for their HE degree.

2.2. Research instruments and participants

This study was conducted at health science universities in Phnom Penh, Cambodia. Those universities include the University of Puthisastra, the University of Health Science, Chenla University, the International University, Norton University, and the Health Science Institute of RCAF. The study was adapted to the quantitative survey conducted by Spearman et al. [20]. The questionnaire consists of 16 questions. A qualitative study of focus group discussions (FGD) was used as a wrap-up to get more in-depth information about the student's perceptions. The FGD protocol covers a total of 12 open-ended questions. It took around 15 minutes to complete the questionnaire designed through an anonymous online Google form (blocked IP address). All participants were invited to join a FGD.

Participants who filled in the questionnaire and agreed to be contacted for the FGD were separated into sub-groups of 3–6 participants. The FGD lasted 45–60 minutes, while notes were taken during the discussions. The FGDs were conducted online and physically depending on the participant's convenience.

2.3. Data collection and analysis

Before data collection, the authors sent the proposal to the University of Puthisastra Research Committee (UPRC) for approval. After gaining approval, the questionnaire was sent to the students at those six sampled universities. The online questionnaire consisted of information about the aims of the study. The student participants were recruited using purposive sampling to meet the study's objectives.

This study was conducted in two stages: the first was a quantitative survey, and the second was a qualitative study by FGD. Quantitative survey data were analyzed using Statistical Package for the Social Sciences (SPSS) version 24. The qualitative data were analyzed thematically.

2.4. Ethical considerations

The participants were informed that their data must be kept confidential and utilized solely for the study, and their names are unnecessary. Furthermore, it was ensured that participants could withdraw from the study if they were uncomfortable, mainly if they had privacy issues with the study, and their responses would be destroyed five years after the study was finished. The four norms of ethics that this study adhered to were (1) avoiding injury to participants, (2) ensuring that participants' agreement was obtained, (3) protecting participants' privacy, and (4) preventing disappointment [21].

3. RESULTS

The survey was distributed online via the Google platform, and the survey questionnaire was sent to students attending health science universities in Cambodia via email and social media posts. In total, 121 participants from various Cambodian health science universities were involved.

3.1. Students' demographic data

This study found that out of 121 undergraduate and graduate students, there were 75 (61.98%) males and 43 (35.54%) females, and they preferred not to say 3 (2.48%), respectively. In terms of the age groups of the respondents, the majority of students in this survey were young adults between the ages of 17–25, as expected, 116 (95.87%), with 3 (2.48%) of participants between the ages of 31–40, and only 2 (1.65%) of the participants between the ages of 26–30 years old. Table 1 shows that the majority of respondents identified themselves from Phnom Penh city, mainly consisting of 23 (19.01%), followed by Kampong Cham 15 (12.40%), Siem Reap 10 (8.26%), Kandal 9 (7.44%), Takeo 9 (7.44%), Kampong Speu 8 (6.61%), Svay Rieng 5 (4.13%), Battambang 5 (4.13%), Pursat 5 (4.13%), Kampot 5 (4.13%), Kampong Thom 5 (4.13%), and the remaining 7 (5.79%) from the other provinces, respectively. These findings point out that information regarding health science majors and health science universities, available for students since they are studying in high school, is more effective for them in making future health science major decisions than in other provinces. The students living in Phnom Penh city may have easier access to health science universities and health science major information for their HE degree than those in the provinces.

This study shows that 21 (17.36%) of the respondents were working students, whereas the other 100 (82.64%) of the respondents were not working at the moment (Table 2). According to Figure 1a, the results indicate that most of the respondents are from the University of Puthisastra 95 (78.51%), followed by the University of Health Science 13 (10.74%), International University 6 (4.96%), Chenla University 4 (3.31%), Norton University 2 (1.65%), and Health Science Institute of RCAF 1 (0.83%), respectively. As shown in Figure 1b, the results also indicate that most of the students were highly interested in enrolling in the majors of medical doctor 42 (34.71%), pharmacy 40 (33.06%), dentistry 18 (14.88%), nursing 18 (14.88%), medical laboratory technology 2 (1.65%), and midwifery 1 (0.83%), respectively.

Table 1. Students' enrollment from each different province of Cambodia (N=121)

Province/City	Frequency	Percentage (%)
Phnom Penh	23	19.01
Kampong Cham	15	12.40
Siem Reap	10	8.26
Kandal	9	7.44
Takeo	9	7.44
Kampong Speu	8	6.61
Svay Rieng	5	4.13
Battambang	5	4.13
Pursat	5	4.13
Kampot	5	4.13
Kampong Thom	5	4.13
Tboung Khmum	4	3.31
Banteay Meanchey	4	3.31
Prey Veng	3	2.48
Kampong Chhnang	2	1.65
Sihanoukville	2	1.65
Other (each province has one student)	7	5.79

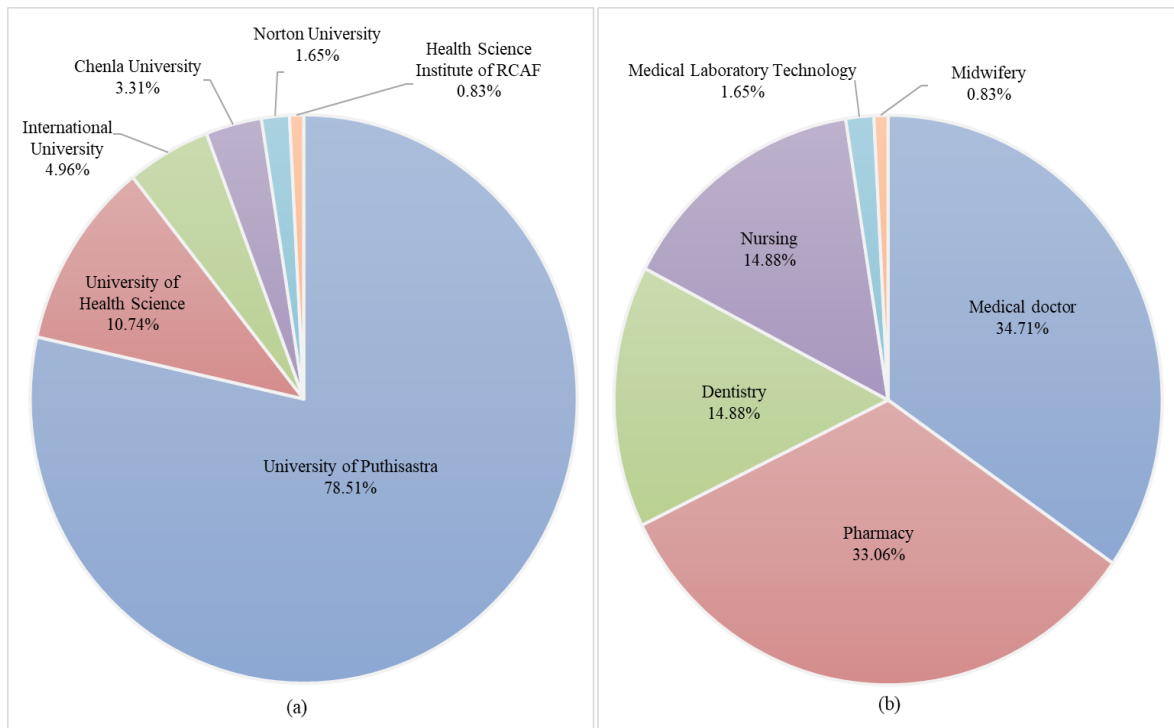


Figure 1. The percentages of enrollment in each health science university and health science major (N=121)
 (a) Enrollment in health science university; (b) Enrollment in health science majors

3.2. Factors Influencing Students' enrollment in health science majors

Table 2 shows the factors students first find out about their current health science university. However, results from this study indicate that the students were introduced to

their current university through several factors, including their family members and friends 79 (65.29%), getting information via social media posts by the university promotion 76 (62.81%), followed by a recommendation from their working place 16 (13.22%), school presentation/ fairs 11 (9.09%), marketing campaigns/ activities 3 (2.48%), and promotions activities 3 (2.48%), students themselves 2 (1.65%), and being introduced by their teachers/ lecturers 2 (1.65%), respectively. This result reveals that family/friends and social media play the most important roles for students to know and consider enrolling in a health science major. However, a small percentage of university marketing campaigns and promotion activities, students themselves, and teachers/ lecturers introduced to health science majors and universities.

Table 2. Students first find out their current university (N=121)

Factors	N	%	Description
Family/ Friends	79	65.29	Introduced by family or friends
Social Media	76	62.81	University social media, e.g., Facebook, LinkedIn, Instagram, etc.
Workplace	16	13.22	There were 21 (17.36%) working students; however, 16 (76.19%) out of 21 were recommended by their workplace.
School presentations/ fairs	11	9.09	During national fairs/ conferences/ symposiums
Marketing campaigns/ activities	3	2.48	University marketing campaigns/ activities, e.g., during the grade 12 national exam
Promotions	3	2.48	University promotions, e.g., free/ discount on teeth treatment, cleaning, etc.
Myself	2	1.65	Know their current university by themselves
Teachers/ Lecturers	2	1.65	We are encouraged by their teacher/ lecturer

This study shows several factors encouraging students to enrol in health science majors, as summarized in Table 3, which indicates the percentages of student perceptions of enrolling in health science majors. In comparison, 38 (31.4%) of the students agree, and 46 (38%) strongly agree that the tuition fees played a significant role in my choice of selective university and major of study. Also, 47 (38.8%) of the students agree, and 46 (38%) strongly agree that the specialization courses offered by the university are the primary reason for them to consider enrollment. 45 (37.2%) of the students agree, and 38 (31.4%) strongly agree that modern technology at the university is essential for them. 38 (31.4%) of the students agree, and 36 (29.8%) strongly agree that their family's choice played the most crucial role in helping them select the university and major of study. However, 36 (29.8%) of the students agree and strongly agree that gaining a scholarship was also a factor for them to consider for the university and major of study. Also, 43 (35.5%) of the students agree, and 29 (24%) strongly agree that the university's location also played an important factor in choosing a university and/or major of study. At the same time, 52 (43%) and 45 (37.2%) of the students agree that the university's social status and social events and activities are also important factors for gaining experience and deciding on their university and major of study.

Table 3. Factors encouraging students enrolled in a health science major (N=121)

Scale	N	%	Description
Strongly agree	46	38	Tuition fees played a large role in my choice of university
	46	38	Specialization courses offered are a major reason why I chose my university.
	38	31.4	It is important for my university to have modern technology available to me.
	36	29.8	My family played a large role in my choice of university
	36	29.8	The possibility of gaining a scholarship influenced my choice of university
	30	24.8	The location of the university is an important factor to me
Agree	52	43	The social status of my university means a lot to me
	47	38.8	Specialization courses offered are a major reason why I chose my university.
	45	37.2	It is important for my university to have modern technology available to me.
	45	37.2	The social events/ activities are an important factor of my university experience.
	43	35.5	The location of the university is an important factor to me
	38	31.4	My family played a large role in my choice of university
	38	31.4	Tuition fees played a large role in my choice of university
	36	29.8	The possibility of gaining a scholarship influenced my choice of university
Neutral	31	25.6	Campus size and infrastructure is very important to me
	29	24	The location of the university is an important factor to me
Disagree	37	30.6	I chose my current university because I had friends who are attending
Strongly disagree	51	42.1	I chose my current university because I had friends who are attending

Table 4 shows the results from FGD for what factors encouraged them to enrol in a health science major. The thematic-based results indicate that students enrolled in those health science majors were related to several factors, including life experience, role modules, family support, engagement, academic performance, and career perspective. Regarding life experience, the students mentioned that they went to the hospital when they were young. However, those healthcare providers ineffectively treated them due to the lack of healthcare professionals in this field, so they want to become professional healthcare providers to the Cambodian people for better health and well-being. Three students mentioned that their family members and relatives work in the health science fields, including medical doctors, dentists, and nurses. This caused them to love this job and want to replace their family members or relatives in the future. Most students also mentioned enrolling in this health science major because they want to run their clinic, pharmacy store, or hospital and work in the governance sector after graduation. Students also revealed that they decided to enrol in this health science major because they have a good record in high school with the science courses, so they decided to study this health science field. Two students mentioned that they decided to enrol in a health science major due to their teacher/lecturer engagement during high school and their foundation year in the English-related subject. However, the students also mentioned that even though they are interested in this health science major, they will not follow their dream if they are not getting support from their families for tuition fees and daily expenses. These findings also reveal that the students' choices in enrolling in a health science major are mainly related to the family's direction, academic performance, career perspective, role modules, and life experience.

Table 4. Theme-based on factors encouraging students enrolled in health science majors – challenge and opportunity

Factors	Description
Life experience	There is a lack of healthcare professionals, so they want to be professional healthcare providers to help the Cambodian people.
Role models	His/ her family members or relatives work in the health science fields.
Career perspective	They want to run their clinic, pharmacy stores, hospitals, and government sector.
Academic performance	There are good records in science courses in high school.
Family support	Financial support for tuition fees
Engagement	Teachers/ lecturers, and family members

4. DISCUSSION

As the results show, several factors influenced students' decisions to enrol in health science majors at HEIs in Phnom Penh, Cambodia. These influencing factors include family support and encouragement, university profile (qualification and reputation), life experience, career perspectives, and academic performance. The results are consistent with studies conducted by Gameraddin et al. [3], Wüst and Leko Šimić [20], and Mehmood et al. [23], showing that students' decision on a health science major for their career choice was influenced by encouragement and support from their families. This result is similar to those of Al-Omar [24] and Al-Faris et al. [25], conducted in Saudi Arabia. The university profile, including specialization courses and location, was another factor they considered before deciding to study.

The current study examined the factors influencing students' enrollment in health science majors for their higher education degrees. It was discovered that the students chose to benefit society through discipline and that helping patients was one of the most important reasons they chose their current profession, as across their life experience, there is a need for healthcare professionals in Cambodia (Table 4). Our findings are consistent with those of Crossley and Mubarik [26], who found that the essential reason medical students chose their field was to help the community and others achieve better health and well-being. Similarly, our findings agreed with a previous study conducted in Sydney, which found that helping others was a major driving force behind their studies [27].

The results demonstrated that a future career perspective was also identified as one of the most important factors motivating the participants to enrol in the health science major. They reported that they wished to run their businesses, including a pharmacy store, a clinic, and a hospital, and that they wanted to become a professional doctor or professional healthcare provider serving in the government sector [22], [28].

The study further found that the availability of health science majors, universities, and scholarship information was crucial in preparing high school students for health science majors. However, this decision depended on students' personal interests and academic performance. Students who wish to take a health science program require a passing score in the National Entrance Examination (NEE) and academic merit in science

courses (i.e., math, biology, and chemistry) to compete for the limited chairs in the health science majors [14], [29], [30].

5. CONCLUSION

Based on the results obtained herein, family direction, availability of health science majors and university information, role models, and students' interest and performance have significantly influenced students' decisions for health science majors while considering their HE degree. Finally, the results generated from this study would help health-related stakeholders, parents, and students plan to provide the most essential information and prepare well for the health science majors.

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