The roadmap in selecting a supervisor for Cambodian graduate students in health sciences

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ABSTRACT

With a remarkable increase in the number of students pursuing higher education in Cambodia over the past decade, this article aims to provide practical tips for Cambodian students pursuing a master's or doctoral degree in health sciences on how to select a supervisor. Unstructured literature searches were conducted, and key factors are outlined to consider when selecting a supervisor, including research interests, statistical expertise, scholarly publication record, mentorship, financial support, expectations, and decision making. Each of these aspects is discussed to help students weigh the relative merits of a potential supervisor. This study is the first ever attempt to outline supervision for graduate students in Cambodia. This article concludes that selecting a potential supervisor for Cambodian graduates in health sciences is necessary to assist them due to the growing number of Cambodian students in higher education, which necessitates the implementation of a well-designed advising mechanism to meet their needs. Further research needs to explore the role of the supervisor, challenges, and needs among Cambodian graduate students as the country continues to grow in graduate education with limited experience and overall resources.

Keywords: *Cambodia, Graduate education, Higher education, Health sciences, Supervision, Supervisor.*

Highlights of this paper

- This article aims to provide practical tips for Cambodian students pursuing a master's or doctoral degree in health sciences on how to select a supervisor.
- The guidance on selecting a supervisor was discussed, including research interests, statistical expertise, scholarly publication record, mentorship, financial support, expectations, and decision making.
- Further research is needed to explore this challenging topic in the country due to the rapidly growing number of Cambodian students in higher education.

1. INTRODUCTION

Since the fall of the Khmer Rouge regime (1975–1979), Cambodia has made remarkable progress in rebuilding its infrastructure, including the education sector. The country's achievements in the education sector are notable (MoEYS, 2023; Williams, 2014). The number of higher education institutions nationwide increased from 111 in 2013 to 132 in 2022 (MoEYS, 2023). To date, the number of public higher education institutions has increased from 43 to 48, and the number of private institutions has increased from 67 to 84. Among all programs, 10 in public and 39 in private institutions offer master's degrees, while seven in public and 18 in private institutions offer doctoral degrees. Of all faculty lecturers, 23.6% had a bachelor's degree, 67.6% had a master's degree, and 8.8% had a doctoral degree. Cambodia reported that the budget spent on higher education was approximately $93 million in 2022.

According to the Ministry of Education, Youth and Sports, the number of higher education students decreased from 249,092 in 2013–2014 to 209,059 in 2021–2022. This decline was attributed to the impact of the COVID-19 pandemic and the lack of data from other ministries governing higher education institutions, including the Ministry of National Defense, Ministry of Interior, and Ministry of Labor and Vocational Training.

Most students in higher education chose to specialize in social sciences, while the remaining 30% opted for majors in sciences, information technology, engineering, arts, and mathematics (Open Development Cambodia, 2022).

The growth of higher education in Cambodia, specifically referring to master's or Ph.D. training programs in this study, has posed significant challenges for both students and supervisors.

Evidence shows that several factors influence higher education in Cambodia, such as a lack of academic background, the experience and teaching skills of instructors or lecturers (Doeur, 2022), and a lack of research experience and skills among faculties in some public higher education institutions (Open Development Cambodia, 2022). Additionally, it has been recognized that some public and private higher education institutions in Cambodia recruit foreign supervisors, who virtually oversee their students from abroad. Moreover, most public and private higher education institutions in Cambodia are governed by Cambodian ministries (MoEYS, 2023) which can be challenging regarding supervision processes and research priority standards (Lee et al., 2021). This circumstance has specific requirements for both students and supervisors. These challenges can negatively impact students physically, psychologically, and academically in addition to the financial stress associated with their study performance (Hanson, 2024).

Selecting a supervisor is a personal decision that must be considered carefully, as it can be critical for the journey of the student's research (Jafree, Whitehurst, & Rajmohan, 2016). Choosing an appropriate academic supervisor can alleviate students' burdens and facilitate their research. However, the process is not easy and requires careful consideration of certain aspects by both the student and the potential supervisor (Almusaed & Almssad, 2020). It can be frustrating for some students during their academic journey if the process is not satisfactory (Le, Pham, Kim, & Bui, 2021).

Due to the critical nature of selecting a supervisor for health science students, it is important to determine if available studies have been published in peer-reviewed journals to guide graduate students in selecting a potential

supervisor. The current study focuses on the selection of a supervisor for graduate students pursuing health sciences in the context of Cambodia.

2. LITERATURE REVIEW

A brief, unstructured literature review was conducted, focusing on keywords, such as supervisor, graduate students, and health sciences, in English articles from peer-reviewed journals published between 2020 and 2023. Additionally, the search phrase "selecting a supervisor for health science research" was used. The search was primarily conducted using advanced search features on the Google search engine. Numerous online resources related to the topic were found within libraries or institutions across European, North American, and some Southeast Asian countries. These resources are not discussed here. To our knowledge, few studies have been published in peer-reviewed journals to guide graduate students in selecting a potential supervisor. No information or study was available for our specific inquiry in either educational libraries/institutions or peer-reviewed journals for Cambodian students.

However, Jabre, Bannon, McCain, and Eglit (2021) set out ten rules to consider when choosing a supervisor for doctoral studies. These rules are: aligning research interest (rule 1), seeking a trusted source (rule 2), managing expectations (rule 3), conducting interviews (rule 4), understanding workstyles (rule 5), meeting with current students (rule 6), meeting with past students (rule 7), considering experience (rule 8), trust your gut instinct (rule 9), and wash/rinse/repeat (rule 10).

Borregaard et al. (2022) stated that a key factor in doctoral education success is finding an appropriate academic supervisor. The graduate student–supervisor relationship is complex, but there is no agreed consensus. Lee et al. (2021) identified several challenges that can affect this relationship, such as a lack of supervisory access, poor research expertise, a lack of experience among clinical supervisors hindering high-quality supervision, and a lack of clear standards from parties involved in research guidance and examination.

In practice, a good scientific supervisor should have in-depth specialized knowledge on the topics they supervise their students in (Almusaed & Almssad, 2020). The supervisor should guide their students through various steps, including overseeing their progress, mentoring them on the study subject, guiding the study methodology, and assisting with thesis writing, as well as sponsoring them in academic activities and professional developments.

However, the expectations of students and supervisors may not always align. Most students expect the responsibility to be equally shared between the supervisor and student during the development and execution of the research project (Althubaiti & Althubaiti, 2022). Some students expect the supervisor to be responsible for the research themes and content, ensuring access to facilities, and assisting in the actual writing of the final research manuscript. Differences in expectations have been found between junior and senior students.

The satisfaction level of students related to supervision varies and impacts their overall well-being. Cardilini, Risely, and Richardson (2022) reported that more than one-third of graduate students experience a significant negative impact on their overall psychological well-being. This study found that students' psychological well-being was significantly affected by a variety of factors, including personal expectations (54%), research progress (53%), research environment (32%), supervisor expectations (31%), and their relationship with their supervisor (29%).

Hart et al. (2022) reported that students need both generic skills (75%) and research-based skills (71%) to successfully complete a project as both skills are important for medical students' research project success. The authors also recognized that a barrier to successful research projects is the lack of protected time for research activities (61%). Additionally, financial and other academic support were identified as factors that could improve research projects.

When a student's research project involves a field placement, the perception and satisfaction of field placement supervision are influenced by the student's field of study. For example, health science students (e.g., nurses) exhibited the highest level of satisfaction with placement supervision, while allied health students (e.g., physiotherapists) showed the lowest level of satisfaction. Therefore, improving the supervision experience for students during placements is essential (Borrallo-Riego, Magni, Jiménez-Álvarez, Fernández-Rodríguez, & Guerra-Martín, 2021).

According to Ives and Rowley (2005) students who felt involved in supervisor selection, whose topics were matched with their supervisor's expertise, and who developed good interpersonal working relationships with supervisors were more likely to make good progress and be satisfied. In fact, students' research output is significantly influenced by various factors (Chikte & Chabilall, 2016) including available resources, academic and administrative support from the institution, and the level of supervision. Therefore, the supervision model offered by the institution should include training and information strategies that enhance generic skills, research skills, and academic capacity. This should cater to capacity and diversity demands while developing students to be researchers, supervisors, or academics with motivation, expertise, skills, personal characteristics, commitment, expectations, preparedness, competency, and diversity.

In Cambodia, there is a lack of specific guidelines, and no online resources are available to guide Cambodian graduate students in selecting their supervisors for both public and private educational institutions. This paper aims to fill the gap and provide advice to Cambodian graduate students pursuing health sciences to navigate this complex decision-making process.

3. RESULTS/DISCUSSION

From our experience as former graduate students, *"a supervisor is more than just an academic guide. They also serve as a mentor, assisting students in overcoming research obstacles and addressing physical and emotional needs to ensure the best study outcomes."* Figure 1 presents a practical roadmap for Cambodian health science graduate students to consider when selecting a potential supervisor. The details of each factor are discussed below.
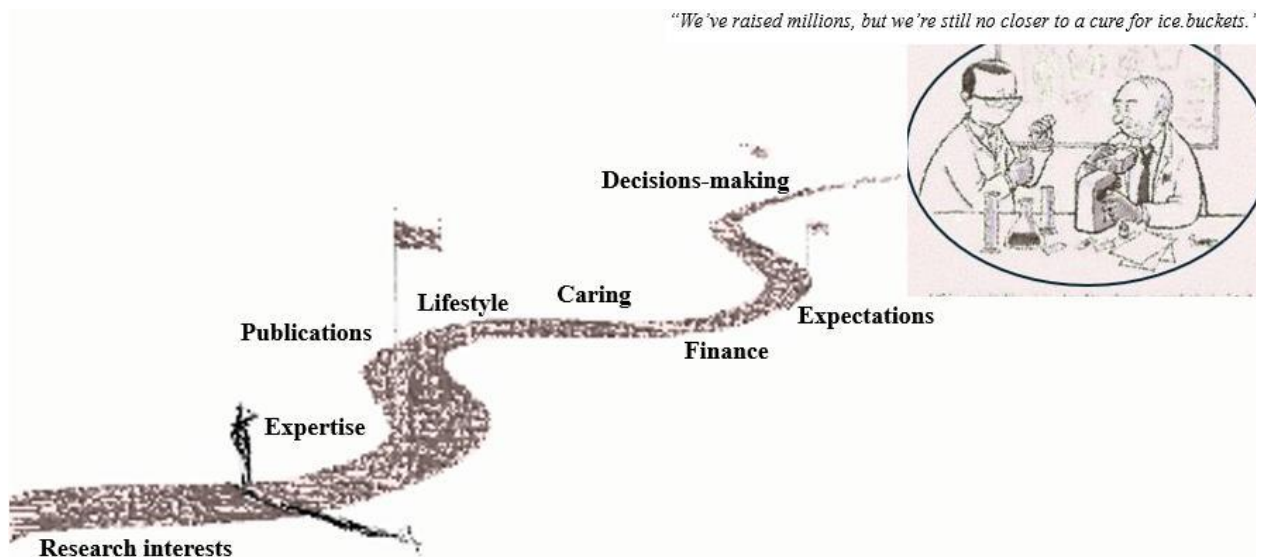

Figure 1. Roadmap for Cambodian health science students to consider when selecting a potential supervisor.
Source: Cartoon by B. Schwartz https://www.newyorker.com/cartoons/daily-cartoon/daily-cartoon-thursday-august-21st-ice-bucket.

3.1. Research Interests: Avoiding Mismatch

It is crucial for students to be aware of the potential for mismatch between them and potential supervisors if both parties have not sufficiently vetted each other (Almusaed & Almssad, 2020). This should be avoided from the beginning.

Before entering a program, students should have a clear idea of their research interests. Once students have identified their interests, the process of identifying a potential supervisor will be easier. Students are encouraged to review the potential supervisor's research background (e.g., basic science, clinical research, community-based research, administrative research, or research methods). It is essential for students to ensure that their potential supervisor's research interests closely align with their own (Jabre et al., 2021).

In this regard, students should be aware that a supervisor's research background may influence their research interests. For example, a potential supervisor with a research background in basic science or clinical research may not be well suited to advise a student whose research interests lie in community-based health research or administrative health research, and vice versa. Even if the student and potential supervisor share the same research area (e.g., cancer, HIV, cardiovascular disease, aging, or mental illness), research alignment is crucial.

3.2. Research Expertise: Essential Knowledge and Skills

It is important for students to determine whether the potential supervisor has experience and expertise in research methods (e.g., qualitative or quantitative methods) that align with the student's research interests (Chiappetta-Swason & Watt, 2011).

While students acquire statistical skills in the program, specific statistical tests or models (e.g., hierarchical modeling, generalized linear modeling, latent growth modeling) may be required for a particular research question. However, not all of these statistical tests or modeling techniques are covered in research courses. Therefore, students are encouraged to assess the research expertise of potential supervisors. In some cases, supervisors may facilitate students to seek statistical advice from their colleagues.

It is crucial for students to recognize that supervisors, often medical doctors, may not have extensive research training (Yuan & Liu, 2019). Therefore, students should carefully consider potential supervisors' research experience and skills, or lack thereof.

Students should also be aware that even if the potential supervisor holds a master's or Ph.D. degree, they may not have been recently actively involved in research or for an extended period due to research not being a priority in Cambodia. In such cases, students and the institution should engage in thorough discussions. Ideally, the potential supervisor should have a robust and up-to-date research track record. However, it should be kept in mind that being a good graduate supervisor is much more than just being clinically and academically experienced (Borregaard et al., 2022).

Theoretically, it is possible for a graduate student (i.e., a master's or Ph.D. student) to work with a supervisor who is not an expert in the student's research area. However, it can become very challenging at times when the student needs help from the supervisor as the student is not an independent researcher and generally needs to follow the directions set out by the supervisor. In a situation where both parties (i.e., the supervisor and student) missed out from the beginning or the student wants to work on a different research topic, the best course of action would be to change the supervisor. However, it is never an easy process.

3.3. Scholarly Publication Record: Don't Just Count the Numbers

Students are advised that a high number of scholarly publications by a potential supervisor does not always indicate strong research ability, as many universities hire faculty lecturers by focusing on publications and not on teaching ability. Even if the person is listed as the first author in papers, there may be cases of fraud or ghost authorship (Rawat & Meena, 2014).

When evaluating a supervisor's scholarly publications, students should look beyond the quantity of papers. Despite the limited data, it is worth noting that up to one-third of articles published in peer-reviewed journals are not original research articles (Flanagin, 1998). Instead, they may be opinions, brief reviews, conceptual pieces, perspectives, commentaries, theories, a case study or series of case studies, letters to the editor, communications, or methodological ideas (Flanagin, 1998; Ghasemi, Mirmiran, Kashfi, & Bahadoran, 2023). Therefore, it is important for students to carefully read and explore the details in the methods and results sections to determine if a potential supervisor's work aligns with what they are seeking in published articles. Students are encouraged to use various online library resources to verify that an article is a peer-reviewed publication.

3.4. Professional Lifestyle: A Busy Schedule Doesn't Always Mean Quality

Students are advised that a supervisor's professional lifestyle may impact their overall learning performance as the potential supervisor will oversee the student's academic learning and research progress (Almusaed & Almssad, 2020; Lee et al., 2021). Students should be aware that a potential supervisor's schedule is always busy, and they may have different supervision tactics. For example, some supervisors may only be able to supervise a few students at a time, some may have strict rules, and others may evaluate a student's progress on a regular basis. However, a busy schedule is not always a sign of quality. As a rule of thumb, a supervisor who is always busy (e.g., tight schedule, many research projects, multiple positions, frequent travel) may interfere with a student's learning and needs. Students are encouraged to review the potential supervisor's record of successful supervision, which can be obtained from the program or institution in which the supervisor is enrolled. Students are also encouraged to speak with current and former students about the strengths and weaknesses they experienced with the potential supervisor. With luck, students will get the information they need about a potential supervisor. Unfortunately, this may not be as easy as one thinks as not many students will want to share this information. If possible, students should inquire with the potential supervisor's department about their academic record. This will allow them to make an informed decision when selecting a supervisor who will best support their academic and research endeavors.

3.5. Caring: A Must, as Neglect Can Happen

It is recommended that students look for potential supervisors who are enthusiastic and supportive of their academic goals. Negative supervision experiences during graduate training can manifest in various forms, such as a supervisor being abusive, neglectful, ghosting, or overly controlling (Almusaed & Almssad, 2020). The ideal supervisor should treat the student as a future colleague and collaborator, rather than an employer or boss. Additionally, the potential supervisor can play a role as a mentor in the student's career development (Almusaed & Almssad, 2020; Keshavarzi et al., 2022; Le et al., 2021). Graduate students have reported higher levels of satisfaction when they experience growth in their academic skills during their training (Le et al., 2021).

As previously mentioned, the potential supervisor typically acts as a guide, assisting the student in overcoming research challenges and addressing their physical and emotional needs to ensure the best possible academic outcomes.

3.6. Financial Support: Can be Critical for the Student

In developed countries, research grants allow supervisors to provide guaranteed academic funding, including tuition, as well as stipends for their students. One of the advantages of working with a supervisor who has a research grant is that the student may have a chance of receiving funding from other research institutions when applying, but it is never guaranteed. In some cases, a potential supervisor will only agree to supervise if the student has the financial resources, such as family savings or student loan programs, to pay for living expenses and tuition (Hanson, 2024).

In a country like Cambodia, funding for a student may not be available from supervisors or other resources, but it is complicated to obtain from the student's institution or the government. Yet, public funding for higher education was less than 10% of the total education budget, climbing from 4% in 2012 to 9% in 2016 (Mak et al., 2019). If funding is available, a student should always check the duration of the funding with the potential supervisor. In practice, most Cambodian students pay their own tuition fees, while some receive small awards from the government or their institutions. In fact, financial support from a supervisor is crucial because it can provide students with the opportunity to pursue their studies without incurring debt, which is a burden after graduation (Meas, 2021).

3.7. Expectations: Outcomes-Driven Not Too High, But Not Too Low

It is common for students and supervisors to be well aligned at the beginning of the application process. Most students are considered to have academic motivation, enthusiasm for the field, and a degree of independence as important factors to be successful. Students often prioritize good academic grades and have higher expectations, while supervisors value a student's ability to think critically. However, one in ten students reported receiving below average supervision (Cardilini et al., 2022). This mismatch in expectations has a negative impact on students' psychological well-being.

Understanding students' expectations in a supervisor–student relationship, particularly for medical students, is essential to successful research and collaboration (Althubaiti & Althubaiti, 2022). Providing clarity on the expectations and responsibilities of those participating in the research program is crucial, as this would likely advance the output of the research program and encourage clinicians to join the program as research supervisors.

Therefore, it is strongly advised that both parties mutually agree through written communication on disciplinary knowledge, critical thinking skills, and academic grades. If the supervisor places a higher value on qualitative outcomes such as knowledge and critical thinking skills than the student does, discussions should be had as these outcomes provide a valuable skill set for future jobs. In our experience, most supervisors expect their students to publish one or two articles by the end of their candidacy, placing importance on winning awards and grants during the learning process, regardless of whether students are under their supervisor's grants.

After graduating, former PhD students should strive to keep their research active, although the number of publications can vary widely.[1] In our observations, during the first three years post-PhD, former students are expected to publish up to three quality articles in reputable, peer-reviewed journals to be considered as actively contributing to their field. A postdoc student in academia might aim to publish around three to five articles per year to build a strong publication record. For a senior with advanced experience in academia, the number of publications can be five or more.[2]

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[1] https://www.researchgate.net/post/How_many_publications_per_year_are_you_expected_to_produce

[2] https://www.timeshighereducation.com/campus/ten-platinum-rules-phd-supervisors

However, achieving scholarly publications vary by age, gender, and academic field, such as technology, medicine, and natural sciences (Rørstad & Aksnes, 2015). Age seems to be an important variable in both technology and medicine, but it does not have the same importance in natural sciences. There are also differences in differences in publication rates between males and females with the largest gender gaps seen in natural sciences and the smallest in medicine.

3.8. Decision Making: No Right or Wrong Formula

By this stage, students should have gathered enough information to select a potential supervisor. After collecting all the necessary information, students should carefully weigh the benefits and risks (i.e., pros and cons). There is no definitive formula for the student to follow, but they should decide whether the potential supervisor is the best fit for them. The student should make a thoughtful decision by evaluating each factor, weighting the pros and cons and balancing them to align with their own interests and needs.

4. IMPLICATIONS AND LIMITATIONS

Supervision for health science graduate students in a context with limited research opportunities such as Cambodia is critical for developing the necessary research skills. Effective supervision can help overcome resource limitations, enhance research capacity, and support the long-term development of a research culture in the country. This study has several key implications that can influence Cambodian students' academic success, while providing guidance to select a supervisor, and the broader development of research capacity in the country. The main implications are:

- Research skill development: Supervision plays a crucial role in helping students develop essential research skills, such as designing studies, data collection, analysis, and academic writing. Supervisors should aim to prepare students to publish their work in internationally peer-reviewed journals by helping them meet rigorous standards and overcome barriers such as language proficiency and limited access to high-impact journals. This is particularly important in a context where formal research training may be limited.

- Adaptiveness to the country context: Supervision plays a crucial role in helping students focus on research topics that are relevant to the Cambodian context. This includes addressing local health challenges, social issues, cultural sensitivity, or economic conditions that may not be the focus of research in other settings. Foreign supervisors working with Cambodian students should effectively guide them on how to conduct their research studies with limited resources, such as materials, access to academic literature, budgets, and time. This may involve strategies for conducting low-cost research or utilizing open access resources.

- Sustained research efforts and future research opportunities: Graduate students who receive good supervision are more likely to contribute to expanding research capacity in Cambodia. They may choose to continue their academic careers or become independent researchers applying their research skills in professional settings.

- Networking opportunities: Supervision can ensure that students' research projects are sustainable and have the potential to be continued by future cohorts or integrated into broader research programs. Supervisors can facilitate networking opportunities for students, helping them connect with international peers or mentors and other professionals both within Cambodia and internationally. This is critical in a context with limited research infrastructure.

- Career development: Supervision is a long-term mentoring process that has a future impact on students' career trajectories. It helps them secure positions in academia, government, or international non-governmental organizations where they can continue to conduct research.

Health sciences have the potential to address the overall health challenges faced by Cambodia. Core values and expertise in prevention, population health, multidisciplinary collaboration, and support for health systems can effectively tackle health priorities, reduce health inequities, and enhance overall population health. Given advancements in global health technologies and the increasing prominence of financial health protection, low- and middle-income countries such as Cambodia are adopting strategies for universal health coverage (Rabbani et al., 2016). This study aims to fill a gap in the literature on supervision for graduate students pursuing health sciences in Cambodia. The outlined roadmap for selecting a supervisor in health science can be directly applied by students and supervisors to meet their needs. It serves as a starting point for programs and institutions in Cambodia to establish supervisory guidance and improve the quality of the student–supervisor relationship.

Attaining health science degrees can maintain individual professionalization and also contribute to improving Cambodia's health care infrastructure. This study highlights the importance of student–supervisor practices in academic Cambodia, emphasizing that poor supervision can diminish the quality of graduate students in the country.

This study has a few limitations. One of the main limitations is that the study did not use a systematic review approach. An unstructured review may result in inconsistent or incomplete coverage of the literature, as it lacks the rigorous methodology of a systematic review. It also carries a bias risk in choosing literature, which may be subjective and lead to potential bias in the sources reviewed and the conclusions drawn. Furthermore, the recommendations from this study specifically target graduate students pursuing health sciences in Cambodia, which may be vague or less actionable for generalizability to other graduate programs, as the study may not provide a clear analysis of the evidence. However, the current study's limitations in terms of rigor, transparency, and reliability make it less suitable for situations where systematic analysis and evidence-based conclusions are necessary. Nonetheless, despite using an unstructured review method, this study can still be valuable for future exploratory research or broad overviews on the perceptions of health science students, the role of the supervisor, challenges, and the needs of graduate students.

5. CONCLUSION

This study provides a roadmap for Cambodian health science students to choose a potential supervisor. This roadmap discusses the practical key factors of research interests, research expertise, scholarly publication record, professional style, caring, financial support, and decision making for health science students in the context of Cambodia. These key factors emphasize the important characteristics of a potential supervisor in guiding a student's academic journey and future career.

Further research is necessary to explore issues such as health science students' perceptions of higher education, challenges and needs, and the role of the supervisor among graduate students as the country continues to grow in graduate education with limited experience and overall resources.

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