

SHORT THESIS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY (PHD)

Exploring Health Service Quality Perceptions Among International  
Students: An Exploratory Sequential Mixed Methods Study

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Exploratory Sequential Mixed Method**

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## **1. Introduction**

### **1.1 Background**

Since the advancement of science, technology, and transportation, there has been a rapid increase in global population mobility. People move from their home country to other countries with different purposes with different identities such as business people, international students, voluntary workers, tourists, or immigrants. These individuals are referred to as sojourners. Among the different types of sojourners, international students have always been a prominent group. Based on the UNESCO report, globally, the number of higher education students studying abroad has tripled from 2.1 million in 2000 to 6.3 million in 2020. This means there has been an increase of 198% in the past two decades. With an average growth rate annually between 5 and 6% per year, if not interrupted by the pandemic, by 2030 a figure of between 10 and 11 million would have been reached (1). Based on research results from Project Atlas (2017) shows that the main destinations of international students to continue their studies are the United States (24% of 4.6 million), the United Kingdom (11%), China (10%), Australia (7%), France (7%), Canada (7%), Russia (6%), Germany (6%), and other countries (23%) (2). Similarly, East Asia (China, Korea, and Japan) is the one experiencing the most prominent development in the number of students considering studying overseas; followed by Southeast Asia and the combination of Europe and North America(1).

Considering different historical, regional, and social-cultural differences, some countries have proposed an understanding of the characteristics and emphasised the role of internationalisation of higher education (HE) (3,4). The internationalisation of HE in Hungary started in 1989. Following Hungary's 2004 entry into the European Union (EU), Hungarian higher education has been involved in the creation of new academic networks among higher education institutions as well as an increasing amount of academic cooperation with other European nations. Hungary's higher education landscape is closely related to political and policy developments (3).

Higher education has undergone substantial transformations and reforms to equip universities to address the escalating demand for information and knowledge dissemination (2,3,5,6). In Hungary, the internationalization of higher education has significantly attracted a diverse cohort of international students pursuing studies across various academic levels. As a result, the internationalisation of higher education has contributed considerably to Hungary's cultural, social, and economic development (3,7,8). Hungary has emerged as a prominent destination for international students seeking higher education degrees (3,7,9). In the academic year 2022/2023, the number of international students is nearly 36.200(10) and most of the

international students in Hungary are from Germany, China, Romania, Iran, Serbia, Slovakia, Ukraine, Turkey, Nigeria, and Norway. The majority of these international students are enrolled at the University of Debrecen, University of Pécs, University of Szeged, Eötvös Loránd University, and Semmelweis University (11,12).

A body of literature suggests that there are benefits to studying overseas; however, there are also potential challenges and adverse effects, including an elevated risk of poor mental health, cultural and language barriers, financial strain, and academic pressure (3,13,14). Research indicates that university students encounter numerous stressors during their studies, including academic workload, employment, housing, and interpersonal relationships (15,16). These stressors are often intensified and more complex for international students, who must adapt to cultural and linguistic differences while being distanced from familiar support networks, such as family and friends. Furthermore, due to the transition to a new country and environment, international students are prone to experiencing various degrees of physical and psychological adjustment (5,15–18), leading to transition stress and shock, which may lead to academic procrastination (4,7,19,20). Thus, universities must provide diverse support to facilitate international students' degree completion and attainment of their desired educational outcomes (5,9,21). To enhance international students' academic success and performance, the university must provide adequate support, mainly through accessible, high-quality healthcare services. Enhancing the quality of these services is crucial in delivering essential support to international students (22).

It has been proposed that, as a global institution, the caliber of healthcare services and the level of satisfaction experienced by students from diverse national backgrounds represent a fundamental aspect of the overall quality assurance system within universities (23,24). Consequently, enhancing the quality of services, particularly healthcare, to address the needs of international students is essential (18,25).

In Hungary, research examining patients' perceived quality of healthcare services and their satisfaction remains insufficient (26). To the authors' knowledge, no study has investigated the perceived quality of healthcare services, specifically among international students. Such research is anticipated to enhance the understanding of the challenges faced by these students regarding healthcare access. The results will empower policymakers, managers, and healthcare providers to improve service quality. Furthermore, dissatisfaction with healthcare can lead to academic and social withdrawal among students, potentially resulting in incomplete degree programs (24,27).

Quality of health care has a direct correlation to satisfaction (28). Patient satisfaction is a key objective of healthcare, reflecting the patient's evaluation of the quality of the services received (29). Furthermore, assessing and comprehending the experiences of patients, caregivers, and families regarding healthcare services will create opportunities for reflection and enhancement of both care quality and patient outcomes (29–31).

The University of Debrecen is one of Hungary's host institutions for international students, offering healthcare services through its University Health Center (UHC). As stated on the university's website, the institution accommodates over 7,000 students from around the globe (32). The UHC has evolved into a comprehensive center that delivers general medical care to students while they are away from their primary care providers in their home countries. Healthcare services at the UHC are provided at no cost to students, either included in their tuition fees for self-paying students or funded by the Hungarian government through a social security service known as the TAJ card for scholarship recipients (33). As healthcare providers, the UHC encounters and treats an increasingly diverse patient population, necessitating understanding various groups' characteristics and cultural values, particularly international students, to enhance service delivery (34). Consequently, it is essential for the UHC to evaluate service quality to identify what is functioning effectively and what areas require further improvement (35,36).

The initial stage to improving service quality is to identify the strengths and weaknesses of the services provided using service quality measurement tools. Service quality can be assessed by comparing customers' expectations with their perceptions of the service received (37,38). Researchers advocate that service providers analyze the disparity between expected and perceived service quality to identify gaps. They emphasize the importance of utilizing patient feedback to enhance service quality and evaluate the experiences of medical care and patient's perceptions of the quality of services rendered (39–42). Gaining insight into the gap between expectations and perceptions can yield valuable information regarding the factors contributing to service excellence.

## **1.2 Significance of the Research**

Various conceptual frameworks have been established to evaluate healthcare service quality, primarily focusing on the general population, with none explicitly addressing the needs of international students. To the author's knowledge, this is the first instance in which this approach to assessing primary care has been applied to an international student demographic. The University Health Center (UHC) serves as the primary care provider for international students enrolled at the University of Debrecen. Therefore, the findings of this study are

anticipated to be advantageous for the center in refining its strategic planning, particularly concerning future resource allocation aimed at enhancing service quality within the University Health Center.

## **2. Literature Review**

International students are at risk of experiencing problems that can affect their mental, physical, and social well-being. This demographic also encounters particular difficulties that affect their overall health, such as access to and quality of healthcare. Among these problems is the quality of students' healthcare treatments. With an increasing number of international students pursuing education abroad, understanding their perspectives on healthcare service quality is critical to their overall well-being and academic achievement. This literature review investigates the link between international students' well-being and healthcare service quality, highlighting major findings, gaps, and recommendations for future research.

Studies indicate that foreign students face significant barriers to receiving healthcare services, such as a lack of knowledge, language barriers, and unfamiliarity with the local healthcare system. These obstacles may cause delays in seeking care and poorer utilization of accessible health services (6,22,43–45). Additionally, the lack of knowledge and uncertainty about health insurance coverage is another significant barrier to accessing healthcare services. Many overseas students claim confusion regarding the services covered and how to use their insurance successfully (17,18,46,47). Furthermore, the absence of cultural awareness among healthcare practitioners could result in international students feeling misunderstood or disrespected. Differences in cultures in attitudes toward health, illness, and treatment can exacerbate the patient-provider interaction (14,22,31,44,48). Studies also discovered that international students experience discrimination or bias in healthcare settings, which negatively influences their opinion of healthcare service quality and willingness to seek care in the future (6,22,49).

Healthcare service quality is a multidimensional concept that is critical to the successful delivery of healthcare services. It includes a variety of characteristics, such as patient satisfaction, treatment results, and service delivery efficiency (50–54). Healthcare providers must provide high-quality services to preserve patient trust (50). Traditionally, healthcare quality was assessed using objective measures such as mortality, morbidity, infant mortality, and so on. However, as time went on, the industry's structure evolved, and patients' participation in determining quality became increasingly important (50,55). Service quality is the difference between a customer's expectations of service and their perception of service after

it has been given. When perception outperforms expectations, the client is satisfied (29,42,56,57).

Several frameworks and approaches have been established to measure the quality of healthcare services in the literature (38,50,54–56,58–60).

1. Donabedian's Model was introduced by Donabedian, the creator of the Model of Care. This model is regarded as the first study of quality in healthcare. Donabedian, specifically referring to healthcare services, emphasized that the prospect of quality improvement was dependent on both technical and interpersonal quality. Technical care refers to the medical treatment parts of patient care, whereas interpersonal care concerns speaking with the patient about his or her treatment. Donabedian's model includes seven dimensions to assess the quality of healthcare services: efficacy, effectiveness, efficiency, optimality, acceptability, legitimacy, and equity (51).
2. SERVQUAL Model: Developed by Parasuraman, Zeithaml, and Berry, it is one of the most used models to measure quality in service domains because of its comprehensiveness and practical usefulness. This model measures service quality across five dimensions: tangibles, reliability, responsiveness, assurance, and empathy (50,54).
3. HEALTHQUAL Model is a modification of SERVQUAL for assessing the quality of healthcare services in a survey of hospitals. Camilleri and O'Callaghan developed it. This model is an approach that includes six important dimensions: (1) admission procedures, (2) attitudes of medical personnel (doctors), (3) attitudes of nursing officers, (4) ward/hospital environment, (5) patient amenities/facilities, and (6) discharge planning and coordination (61).
4. PubHosQual model. The public-hospital service-quality (PubHosQual) model was created with patients' input. This model was designed by Aagja and Garg (2010) to assess the quality of public hospitals in India, with 24 items classified into five categories of hospital service quality. The dimensions include admission, medical service, overall service, discharge, and social responsibility. The model was used to identify areas that required specific changes, which were then adjusted (61,62).
5. Institute of Medicine Quality (IOM) Dimension Model. This model gives unbiased healthcare information to the US government and business sector to increase the quality of healthcare for all Americans. This fundamental work conceptualized quality as six dimensions: safety, timeliness, effectiveness, efficiency, equity, and patient-centeredness (STEEP)(63).

It is crucial to highlight that these models have supplied some mutual understanding of quality in health care; however, it is important to consider these models critically and focus on the general population and some models initially created for hospital settings. As a result, in the setting of a university health center that provides services to international students, it is critical to design a model based on the target demographic. This is because the quality of healthcare services available to international students varies widely.

Accessibility is influenced by factors such as location, language barriers, and institutional support. International students studying in English-speaking countries might have a different experience from those studying in non-English-speaking countries in navigating healthcare services. Language barriers notably impact the quality of healthcare received by international students as miscommunication between healthcare providers and students might occur and lead to misunderstandings and inadequate treatment. Therefore, universities play a pivotal role in facilitating access to healthcare services to improve students' well-being. The well-being of international students is intricately linked to the quality of healthcare services they receive. Poor healthcare service quality can exacerbate mental and physical health issues, while high-quality, accessible healthcare can significantly enhance their overall well-being.

Some implications for practice that might be taken into consideration are universities should provide comprehensive orientation programs that include detailed information about the local healthcare system, how to access services, and understanding health insurance policies. Additionally, healthcare providers, healthcare workers and university staff should receive training to improve cultural competence, ensuring they can effectively communicate with and support international students from diverse backgrounds. Furthermore, universities should consider providing translation services and healthcare information in multiple languages to help mitigate language barriers and improve the quality of care.

Based on the preceding background and review of literature, the purpose of this study is to investigate international students' perceptions of the quality of service provided by the university health center. The study's specific aims were:

1. To investigate the quality of healthcare services as perceived by overseas students.
2. To establish a model for measuring service quality based on international students' perspectives.
3. To analyze factors influencing international students' perceptions of service quality at the university health center.
4. To assess the importance and performance of the University of Health Centre based on international students' perspectives.

5. To assess the health and well-being of international students living and studying in Hungary.

### **3. Methodology**

Quality refers to a complex structure of values, beliefs, and attitudes among people who engage with the healthcare system. Because of the complex interaction between the quality of health care service and customer/patient satisfaction and to gain a comprehensive understanding from the international student's perspective, this research employs an exploratory sequential mixed methods design. Data collection for both strands occurred in sequences. In this design, the collection and analysis of qualitative data are conducted before the quantitative data (64–66). The exploratory sequential design is usually used as the phenomenon studied was unknown (64–66). Then, the qualitative study results in the first phase became the basis for developing the questionnaire in the second phase(65). The questionnaire was then tested for its efficacy in the quantitative study.

The study was conducted at The University of Debrecen. The population of the study is international students who are studying at the University at all levels of study and faculties. Based on the university website, the number of international students in 2022 was more than 7,000 from more than 120 countries (32).

#### **3.1 Phase 1 - Qualitative Study**

##### **3.1.1 Data collection**

Data collection was done through Focus Group Discussions (FGDs) and in-depth interviews (IDIs). FGDs and IDIs were held using interview guidelines. The FGDs were held online, and the In-depth interviews were held offline at a place convenient to the participants. Furthermore, data was collected from August 14 to September 20, 2022. All interviews were conducted in English; conversations were audio-recorded, and detailed notes were taken with participant permission.

The FGDs and IDIs aim to explore the perceived quality of services in the context of primary health care from the international students' perspective. The guideline was developed based on relevant theories from WHO and several studies (59,67,68). The guidelines consist of several questions about international students' perception of their health and well-being, health-seeking behaviour, and what they mean by quality in health care services. All topics were explored through open questions (Appendix.3). The order of questions was flexible according to each informant's interview responses. The researcher also explored other information outside the interview guide that was interesting and important.

Before the actual data collection, the guideline was pre-tested with three international volunteer students of different genders and countries to evaluate the appropriateness of the language and guiding questions.

### **3.1.2 Participants**

In the qualitative study, participants were recruited purposively using maximum variation sampling (different ages, genders, levels of study, nationalities, and faculties) to achieve diversity in the participants' views, experiences, and opinions. There is no predetermined sample size is needed in the qualitative study as the researcher used the principle of saturation to reach a proper sample size for this strand, i.e. when no more new information or insights can be collected by conducting further interviews (69,70). All interviews were audio-recorded, saved, and encrypted to ensure the anonymity and confidentiality of participants. Each participant provided informed consent to participate in the interview and record it.

### **3.1.3 Data Analysis**

In this phase, the qualitative data obtained from FGDs and IDIs were analysed using thematic analysis. This means that the researcher identifies patterned themes. Step by step of thematic analysis is as follows (71):

1. Data transcription, all the data gained from FGDs and IDI were transcribed verbatim
2. Data familiarisation, all the verbatim transcription needs to be read carefully to provide a better understanding of the study context.
3. The next step is conducting open coding of all data,
4. After creating open coding, the process was then continued by creating axial coding involves identifying the association of codes and merging them into a thematic category. Axial coding through identifying the association of codes and integrating associated codes into a thematic category,
5. Finally, the analysis conducts selective coding. Selective coding is the process of selecting and integrating categories into primary themes.

In this study, all interviews were transcribed using a third-party transcription service, subject to appropriate confidentiality provisions. To increase the trustworthiness of the research findings, strategies used in this study included triangulation of sources and peer debriefing with experts in primary health care and quality services (64,66). NVivo 12 Plus, a qualitative data analysis software was utilised to help in organising qualitative data and the data analysis process.

### **3.2 Phase 2 - Interim Phase**

In this phase, the qualitative findings were used to develop a model for service quality measurement from the international student's perspective and a questionnaire to be tested in the quantitative study. The model and questionnaire were refined after consultation with primary care physicians and health care quality experts who provided input regarding the content and delivery formats.

The questionnaire then underwent a pilot test on 30 international students from various backgrounds, including gender, age, nationality, and level of study. It was then followed by conducting the validity and reliability of the questionnaire. Finally, based on the result of validity and reliability revisions were made accordingly.

The results of validity and reliability tests with the Pearson correlation statistical test ( $r$  count  $> r$  table or  $ir$ -cor more than 0.3) and Cronbach alpha ( $>0.6$ ) mean that the instrument used is valid reliable and ready to distribute.

### **3.3 Phase 3 - Quantitative Study**

#### **3.3.1 Data collection**

After the questionnaire was generated in phase 2, the research then continued with a quantitative study using a cross-sectional survey. To determine what factors, determine international students' perceived quality of services, an analytic, quantitative study was conducted. This study survey was generated as an online survey with Google Forms and offline surveys. A mixture of online and offline was chosen to reduce bias caused by common online survey challenges such as low response rates, unequal participant distribution, and participation bias (72) Although recall bias is likely in both online and onsite questionnaires (72,73), the onsite requirement was implemented to prevent it

Additionally, the University of Debrecen has multiple campuses. Its campuses are located in several areas of the city, namely Debrecen (Main Building, Böszörményi, Ótemető, and Kassai Campus), Nyíregyháza, Hajdúböszörmény, and Szolnok. (32,74–76) As a result, using both online and offline data collection methods boosted the University of Debrecen's reach with international students. The online poll was then circulated to overseas students using social media sites for instance Facebook, Instagram, and WhatsApp. At the same time, the offline survey was distributed through the University Health Center and researchers' networks. Data collection was carried out from 15 November 2022 to 8 March 2023.

#### **3.3.2 Study Measures**

In this phase, the data was obtained employing a self-administered questionnaire. The questionnaire consisted of three (3) sections. The first part includes ten questions about socio-

demographic profiles, including gender, age, nationality, marital status, level of study, faculty, student's status, sponsorship, religion, last visit to UHC service, and how frequent visiting the UHC service. The second part consists of questions related to service quality and well-being statements. The last section consists of an open question asking comments about the quality of care the university provides for international students.

### **3.3.3 Participants**

The calculations with the Raosoft Calculator with a 95% confidence level, 5% margin of error, and 50% response distribution (60) found that the minimum number of samples required is 363 respondents. The eligibility criteria in this study are international students in the University of Debrecen aged  $\geq 18$  years, having active student status from the University of Debrecen, living in Debrecen for at least 3(three) months, having visited or used the University Health Center (GP Clinic) at least 1(one) time. The study participants were International Students at all levels at Debrecen University and were recruited with the Convenience Sampling Method.

### **3.3.4 Data Analysis**

All data were analysed using STATA 12.0. Initially data were edited and cleaned for analysis. Firstly, data were descriptively analysed to obtain variable distributions (i.e., frequencies, percentages, means, and standard deviations). Followed by a bivariate linear regression test to determine crude associations between independent and dependent variables; we nominated candidate variables with  $p$ -values  $< 0.25$ . Finally, a multiple linear regression analysis was performed to examine which independent variables were associated with the dependent variable. Results were considered significant based on  $p$ -values  $< 0.05$ .

Analysis was then continued with conducting the importance-performance analysis (IPA). The IPA is a method to measure customer satisfaction. This method evaluated satisfaction based on two components: the relevance of the service to the client (importance) and the providers' performance in providing the service (performance) (77). This means that IPA examined Performance and Importance as two important components determining customer satisfaction (39). Combining customer ratings from Performance and Importance provided an overall view of satisfaction and clear direction for management regarding where to focus their resources (41,78,79).

The IPA approach compares an ideal value to the current reality; thus, this method may aid for determining the alignment or divergence between theoretical ideals and practical outcomes. significant investigations revealed that the IPA approach has substantial benefits, including ease of operation, efficiency, and applicability to a variety of industries (39,40,80). The IPA

technique has been utilized in the healthcare industry to assess service quality from the patient's perspective in primary care, dental services, hospitals, and medical services (37–39,41,79,81,82).

In its implementation, The IPA technique uses a two-dimensional matrix with Performance as the X-axis and Importance as the Y-axis to categorize service components into four quadrants to determine priorities when allocating limited resources. There are four quadrants in the matrix: Concentrate Here (Q1), Keep Up the Good Work (Q2), Low Priority (Q3), and Possible Overkill (Q4). Martilla and James (77), founders of The IPA approach show how attributes in the four quadrants have various implications for managerial decisions namely :Quadrant 1: Concentrate here quadrant ,In this quadrant, customers (patients) believe that the service or quality characteristic of the services is excellent, but the organisation's (health center) performance is poor. Quadrant 2: Keep up the good work quadrant This quadrant represents customers (patients) who believe that the service or quality of the services is excellent, and the organisation's (health center) performance is also exceptional. Quadrant 3: Low priority quadrant; in this quadrant, the organisation's (health center) product or service quality characteristic performs poorly, and the customers (patients) perceive it to be of little relevance. Quadrant 4: Possible overkill quadrant

This quadrant shows that the organisation's (health center) product or service quality characteristic performs well, but the customers (patients) perceive it to be of low relevance.

### **3.4 Ethics Consideration**

On April 20, 2022, the Ethics Committee of the Faculty of Medicine at the University of Debrecen approved this study under the code (DE RKEB/IKEB) 6047-2022. This study followed the principles outlined in the Declaration of Helsinki. Furthermore, there is no risk to study participants, and the study ensures their confidentiality and anonymity. Indirect benefits may significantly boost access and utilization of appropriate healthcare services. Furthermore, participation in both qualitative and quantitative studies was voluntary. Audio-recorded interviews and transcribed data were encrypted and stored securely for the qualitative study. Moreover, all participants in the qualitative and quantitative investigations provided electronic written informed consent.

## **4. Results**

### **4.1 Phase 1 Results**

This research conducted two (2) FGDs and eight (8) IDIs to explore international students' perspectives on the UHC service quality following their health and well-being. There were

sixteen international students involved in this strand. The interviews and FGDs duration were approximately 50-90 minutes. There are eight males and eight females, mostly (12 students) from Asia, three of them from Africa, and one participant from Latin America. They are studying in master's and doctoral programs. Nine of them are studying in non-health-related faculties and seven students are from health-related faculties.

#### **4.1.1 Healthcare Service Quality**

The analysis from focus group discussions and in-depth interviews found five major themes that represented the study participants' thoughts about the quality of services in the context of primary healthcare. According to international students, the university health center should provide 5 main attributes of quality health care services. Healthcare service attributes identified in this study were primarily Empathy, Equity, Effectiveness, Efficiency, and Safety (4ES).

The qualitative also found several sub-themes related to the service quality dimensions. In terms of empathy, international students pointed out that healthcare workers are required to treat students nicely, show their willingness to listen more and create a comfortable atmosphere during consultation. Below are some quotations from the interviews.

*“Like, for example, they treat me nice, they smile to show..showing genuine smile ..”(IDI\_M\_3)*

*“..well in my opinion they have to show a little bit more empathy..we have no family and are far from home and listening to us more ..” (FGD\_1\_M).*

*“..to some extent I feel not comfortable to discuss about my sickness..I am not feeling comfortable during consultation seems to me they look bit judgemental..maybe just my feeling..but really felt not comfortable..” (IDI\_F\_5)*

Additionally, regarding the Equity dimension participants consider that healthcare workers should treat students with dignity and compassion

*“..after getting the services, I just hope that staff will keep treating Us with dignity and compassion.(IDI\_F\_1)*

Other participants also stated that it is important that the UHC staff treat patients the same. Below is the quotation.

*“..just hoping we can get the same treat as domestic students”(FGD\_3\_M).*

As for the effectiveness dimension, the international student points out that the healthcare staff in the UHC is expected to communicate effectively using proper English so that students can experience better health outcomes and improvement. Here are some quotes derived from the outcomes of FGDs and IDIs.

*“So like we sometimes with the ability to speak in English and so we are very clueless.. like what should we go, what should we do, what should they mean?..”.(IDI\_F\_7)*

*“feels much better after getting examination...the GP really helpful...the lady doctor quite nice..” (IDI\_F\_3)*

In terms of the Efficiency dimension, participants stated that the difficulty of getting an appointment through the online system and the lack of medical staff have become important part that hinders the improvement of service quality in the UHC. Below are some quotes from FGDs and IDIs.

*“ sometimes like somehow difficult to get service from them, because usually not easy to get an appointment”.(FGD\_2\_M)*

*“..only a few doctors available for international students..causing long waiting times..I cannot wait long because I will have a class.(FGD\_1\_M)”*

Finally, in terms of the safety dimension, two themes emerge from FGDs and IDIs with international students. Participants revealed that healthcare workers in the UHC should clearly explain the purpose of the test and treatment and produce a safe patient experience. Therefore, the students will feel confident with less worry about assessing the services. Below are some quotations depicting the students' thoughts about safety concerns.

*“the people go get treatment and say, oh your fine.. only pain and he(GP) didn't explain in detail..maybe because of the language barrier (FGD\_1\_M)*

*“for me, it is important to feel safe when seeking care..cleanliness of the place and the tools use for example. (IDI\_9\_F)*

Based on the result of FGDs and IDIs and the literature review, each dimension can be described as follows: Empathy refers to caring and individualised attention that the healthcare provider delivers to its patients; Equity refers to healthcare workers treating every patient the same; Effectiveness refers to healthcare provider providing evidence-based healthcare services; Efficiency refers to health centres can maximise the benefit of available resources; and Safety refers to the health centre and health workers avoiding harm to patients and reducing the risk of unnecessary harm.

#### **4.1.2 Perspective Well-Being**

The qualitative study also explores the international student's perspective on their well-being while studying and living in Hungary. The well-being analysis found main themes with associated subthemes related to the well-being of international students' perspective while they living and studying in Hungary. From data analysis, study participants emphasised that well-

being is multi-dimensional. Health and well-being were not simple cases of remaining physically healthy but were linked heavily to balancing mental, social, study environment, and language issues. The main themes depicting well-being from concern over academic life, maintaining health status, social connectedness, and environmental connection.

#### **4.2 Phase 2 Results**

The result of the qualitative study is then used to generate a questionnaire, which will be used in the quantitative study. The questionnaire accommodates five dimensions of service quality, which are divided into importance and performance. The importance and performance questionnaire results were then used to conduct the importance-performance analysis (IPA).

The importance part is the part to describe participants' expectations of services provided by the UHC. It consists of 25 statements incorporating 5 dimensions of service quality. Each item is evaluated using a 5-point Likert-type response (1 = unimportant to 5 = very important).

The performance part is the part to describe students' experiences while assessing the service provided by the UHC. It consists of 25 statements incorporating 5 dimensions of service quality. Each item is evaluated using a 5-point Likert-type response (1 = strongly disagree to 5 = strongly agree).

Furthermore, the qualitative result was also used to develop a questionnaire about well-being. It consists of 25 statements incorporating the four main themes of academic life (six statements), maintaining health status (eight statements), social connectedness (five statements), and environment connection (six statements). Each item is evaluated using a 5-point Likert-type response (1 = strongly disagree to 5 = strongly agree).

The questionnaire was improved after consultation with primary care physicians, healthcare quality specialists, and well-being experts. The experts provided feedback on the content and delivery styles. The questionnaire was then pilot-tested to 30 foreign students with diverse backgrounds, including gender, age, nationality, and degree of study. The validity and reliability of the questionnaire were analysed, and revisions were made accordingly. The results of validity and reliability tests with the Pearson correlation statistical test ( $r_{count} > r_{table}$  or  $ir-cor$  more than 0.3) and Cronbach alpha ( $>0.6$ ) mean that the instrument used is valid and reliable, and ready to distribute.

### **4.3 Phase 3 Results**

#### **4.3.1 Perceived Service Quality**

In the cross-sectional survey, 437 international students participated; however, only 402 responses (91.99%) were included in the analysis. Thirty-five responses were excluded because participants did not meet the eligibility criteria or submitted incomplete answers.

The mean age of respondents was 23.72 (5.51), ranging from 18 to 50 years. Female participants constituted 51.25% of the sample, while 48.76% were male. The majority of respondents were from Asia (51.99%), followed by Africa (37.81%), Europe (5.22%), and America (4.98%). Most participants were bachelor's students (46.52%), unmarried (78.86%), enrolled in non-health-related faculties (55.47%), and in their first year of study (41.04%). Additionally, 50.75% of the participants were self-funded, 43.03% identified as Muslim, and 39.80% reported their last visit to the health center within the past month.

The perception dimensions of international students were composed of five attributes based on the 25 statements from the qualitative study. The mean score of the perceived quality attributes was found in the study, where safety received the highest mean score of 21.12 (SD = 3.58), while efficiency had the lowest mean score of 19.57 (SD = 4.34). Internal consistency, measured by Cronbach's Alpha, was calculated for these quality attributes to assess the reliability of international students' perceptions of UHC services, resulting in a strong Cronbach's Alpha value of 0.913. All 25 attributes collectively provided a scoring range from a minimum of 25 to a maximum of 125. Based on the percentage mean score, the study found that 143 (35.6%) of the study participants rated the perceived quality of the UHC as good. To identify factors influencing the perceived quality of service at the university health center from the perspective of international students, further analysis was conducted using bivariate and multivariate methods.

The bivariate analysis revealed that several factors were statistically associated with the perceived quality of services. These factors were further examined in a multivariate analysis, which included candidate variables with bivariate p-values < 0.25. The multiple linear regression analysis indicated that PhD students, students from health-related faculties, and scholarship recipients were significantly associated with the perceived quality of healthcare services provided by the University Health Centre (UHC).

The analysis showed that, compared to bachelor's students, PhD students perceived the quality of healthcare services provided by the UHC as lower, suggesting that higher levels of study

were associated with a decrease in perceived quality. Similarly, students from health-related faculties reported lower perceptions of service quality than those from non-health faculties. Additionally, scholarship recipients had a lower perceived quality of UHC services compared to self-funded students.

### **4.3.2 The Importance-Performance Analysis**

Data analysis was then continued by conducting the importance and performance analysis. This stage is important to find out international student' expectation and their experience in assessing the UHC services.

The study found gaps between importance and performance across all variables (P-value < 0.001). This gap suggests that the University Health Center has opportunities to better align its services with student expectations between student expectations about healthcare quality and University Health Centre performance. From Table 4.6, we can see that the Importance factor ranked safety ( $4.54 \pm 0.56$ ) and efficiency ( $4.31 \pm 0.66$ ) as the most and least important factors to service quality from the international student's perspective. The most significant and lowest mean scores on the Performance component were associated with safety ( $4.22 \pm 0.72$ ) and efficiency ( $3.91 \pm 0.87$ ), respectively.

In the empathy dimension, the highest negative gap is "healthcare workers tell you what you want to know about your symptoms and illness" with -0.38. From the Equity dimension, we can see that "Health workers treat every patient exactly the same" statement has the greatest negative disparity with -0.46. Furthermore, in the Effectiveness category statement "Health workers use effective English" in providing care had the largest negative gap with -0.35. Furthermore, in the Efficiency dimension, "Waiting time for examination fast" has a negative gap of -0.49, and finally in the Safety dimension, the statement "Explaining the purpose of tests and treatments" has the largest negative gap of -0.35.

After defining the gaps between importance and performance across all variables, the next stage in analysis is to run the IPA matrix. The matrix was created after evaluating the importance and performance scores of each quality dimension and characteristic. The IPA analysis demonstrates that quadrant I or the concentrate here quadrant gathered a single quality attribute for international students namely "Health Workers treating every patient exactly the same" or item no. 6. This finding suggests that, according to the international student, the equity trait in treating patients equally is important but performs poorly. This item has to be a top priority for the UHC to improve service quality. From quadrant II or the Keep up the good work quadrant, international students highlighted 13 features that may be regarded satisfactory in addressing their expectations namely three empathy items (item number 1, 3, 4), four equity

items (item number 7, 8, 9, 10), one effectiveness-item (item number 12), and four safety-items (item number 21, 22, 24, 25).

Furthermore, international students identified there are eight traits in quadrant III or the low-priority quadrant namely: one item in the Empathy part (item number 5), three items in Effectiveness (item numbers 13, 14, 15), and four items in Efficiency part (item number 16, 17, 18, 20). This means that categories in which health centres do well, yet international students regard them as less significant than other characteristics. Lastly, in the Possible Overkill quadrant (quadrant IV), this study identifies two traits (items number 2 and 11) that international student's rate poorly. The IPA matrix also suggested that there is one item ("The centre insists on an error-free record") on the boundary of quadrants 1 and 3, which could be improved.

To support the findings from the IPA analysis, this study conducted a qualitative analysis of the questionnaire's free-text responses to support the IPA finding. The thematic analysis of free-text replies revealed two major themes and several sub-themes. According to international students, the UHC can increase service quality by prioritizing human resources and its services. From the human resources theme, the students suggested that health workers should enhance their communication skills, enhance their affective behavior, and increase the number of health workers in the UHC, especially the GP. As for the services, students stated that the number of appointments, access to services, and treatments are critical for future directions.

According to study participants, human resources had become an important issue for improving quality services at the UHC. This is because the UHC is a healthcare provider that encounters and treats diverse patients from different nationalities, therefore, there is a need for health workers to communicate effectively. International students pointed out that the language barrier remains a major issue when seeking care. In addition, students added that providing good interaction between patients and health workers was also important for international students concerning the quality of health care services. International students also stated that the UHC staff is expected to improve their affective behaviour skills. Affective behaviour in this sense can be defined as the ability of health workers to show empathy and respect during communication with patients while seeking care. This is because affective behaviour will contribute to the patient's impression of the center. As a result, it could affect patient treatment and outcomes.

Apart from communication and affective behaviour, some international students also suggest that it is important that the UHC have more doctors in providing their services. The lack of doctors in the center has directly affected the service provided by the UHC, such as late

appointments and long waiting times. This is because The University of Debrecen has more than 7000 international students so it needs a sufficient number of GPs to provide fast services and reduce long waiting times.

In addition to the above findings, international students revealed that appointment problems, access, and services are also the remaining issues that need to be taken into consideration by the UHC. Firstly, a long time to get an appointment through an online system provided by the UHC might hinder students in seeking care. Secondly, the students expected the UHC could improve their access to mental health services and care. Thirdly, the students also wish the UHC could provide 24-hour care and be open during the weekend, as students might get sick late at night. Some students pointed out that it would be beneficial if the UHC could provide them access to their electronic medical records. This access makes student easy to maintain their health status. Lastly, the international students expected that the UHC staff would provide them with a thorough examination. According to the students, a thorough examination highly correlates with the communication aspect of healthcare workers. The UHC staff is expected to give them detailed explanations of their disease, the purpose of tests and treatments, and referrals.

#### **4.3.3 Perceived Well-Being**

This research also seeks to discover international students' perceptions about their well-being while studying and living in Hungary. The findings will contribute to a better understanding the student's perspective and provide better support and care for international students. Based on the result of the filled questionnaire. There are several important findings related to the well-being of international students.

The academic life indicator comprising 6 statements has a minimum score of 6 and a maximum of 30 with a median value of 24 and an average of 23.21. The median value of 24 means that all respondents agree that academic life is in good condition. In terms of health status which consists of 8 statements, the minimum score of 8 and a maximum of 40 with a median value of 32 and an average of 31.36 indicates that all respondents agree that their health status is in good and pleasant condition. Additionally, for social connectedness indicator which consists of 5 statements has a minimum score of 5 and a maximum of 25 with a median value of 20 and an average of 19.52 indicating that all respondents agree that the social connectedness of study participants is relatively good. Finally, the environment connection with 6 statements has a minimum score of 6 and a maximum of 30 with a median value of 22 and an average of 22.02 suggesting that all respondents agree that their connection to the environment condition is

relatively easy to maintain. Further analysis was conducted to better understand what factors are related to international students' well-being.

The results of bivariate analysis that gender, nationality, and student status have a relationship with well-being with  $p < 0.05$ . Furthermore, multivariate analysis using a limit of  $p < 0.25$  suggested that when the variables of gender, nationality, student status, faculty, and sponsorship are included in the analysis, only faculty and student status significantly affect well-being. Multivariate results also show that respondents who come from non-health-related faculties have four times the chance to experience an increase in well-being compared to respondents in the health-related faculty. Additionally, students in the third year, have decreased the chances of experiencing an increase in well-being compared to first-year students.

## **5. Discussion**

This research highlights a significant yet underexplored issue concerning the quality of healthcare services available to international students in Hungary and its impact on their well-being during their studies and residence there. The exploratory sequential mixed method used primary data from a mixed method data collection and analysis.

### **5.1 Healthcare Service Quality**

Understanding patient experience is essential for healthcare organizations, as it is widely acknowledged as a fundamental quality component. It plays a critical role, particularly in strengthening competitive growth strategies within healthcare organizations(25,83). Moreover, delivering patient-centered care has become fundamental to achieving high-quality healthcare (29,83). Numerous studies indicate that a positive patient experience enhances health outcomes, fosters patient loyalty, and increases satisfaction (83,84). Investigating the attributes that contribute to international students' perceived quality of healthcare is essential, given their diverse backgrounds and cultural differences. The qualitative study identified five primary attributes associated with perceived quality among international students accessing the UHC: Empathy, Equity, Effectiveness, Efficiency, and Safety (4ES). These findings may complement existing quality indicators in the healthcare sector, which typically focus on the general population, such as the SERVQUAL, HEALTHQUAL, PubHosQual, HospitalQual models, and the Primary Care Assessment Tool (61,85). Additionally, this research can offer insights into how healthcare services can better meet international students' expectations regarding service quality.

The study revealed that Safety received the highest quality attribute score for UHC services, indicating that international students feel that the safety standards and procedures at the UHC meet their expectations. Within the six pillars of high-quality care, safety signifies providing high-quality care that prevents avoidable patient harm (86). The UHC appears dedicated to maintaining high patient safety standards for international students. This commitment aligns with the WHO's agenda, emphasizing that primary healthcare providers should prioritize patient safety (73,87). This emphasis is due to patient safety being a central attribute of healthcare quality within primary healthcare settings (73,88).

The quantitative study also indicated that service efficiency at the UHC received the lowest rating among international students. This suggests that students perceive efficiency as falling below their expectations, particularly regarding the availability of appointments with general practitioners. Efficiency in healthcare delivery pertains to the prompt supply and provision of services, especially for vulnerable populations (89). According to the findings of the qualitative study, international students reported difficulties securing appointments with general practitioners within the UHC system, which often led to prolonged waiting times. This finding is consistent with the results of various studies that indicated patients expressed the lowest satisfaction levels regarding extended waiting periods (17,90,91). These delays may discourage students from seeking medical care, particularly when they are engaged with academic responsibilities and fully dedicated to their studies (22,43,92). Consequently, this may prompt students to take self-care measures or pursue alternative remedies (17,18,22,92)

Our study revealed a significant correlation between PhD students and their perceptions of the quality of healthcare services at the University Health Centre. This association may be attributed to the extended duration of PhD studies and the greater academic demands placed on these students compared to those in bachelor's or master's programs. Research indicates that the substantial academic pressure faced by PhD students may contribute to the onset of common psychiatric disorders, particularly depression (93). This situation may increase the demand for healthcare services among PhD students. Additionally, students enrolled in health-related disciplines demonstrated a significant association with their perceptions of the quality of healthcare services offered by the University Health Centre. This could be attributed to their relatively higher awareness of healthcare issues, which enables them to better comprehend the available healthcare services compared to their peers in non-health-related fields (94).

Moreover, international students who receive scholarships exhibited a significant association with their perceptions of the quality of health care services. Students with Hungarian Governmental Scholarships are eligible for a Hungarian Social Security card, which grants

these international students access to health care services on par with those available to local Hungarian citizens. (33,95). Conversely, self-sponsored students are required to obtain a combined health and travel insurance policy, which is incorporated into their tuition fees (33). These varying types of health insurance may influence international students' perceptions of health care quality. Scholarship students who possess Hungarian social security cards benefit from a broad array of options for accessing health care services, as this card is valid for all health care services available to insured Hungarian citizens.

To understand service quality and patient satisfaction, it is crucial to measure service quality by comparing the perception of expected service with the service received and perceived by customers (37,38). Studies suggested that to determine where there is a discrepancy between expected and perceived service quality, and healthcare professionals should examine consumer feedback as a means of enhancing quality, as well as evaluate how patients felt about their experiences receiving medical treatment and how they regarded the level of care they received (39–42). Understanding the gap between expectations and perceptions could assist in illuminating the background of service excellence. As mentioned earlier, the IPA matrix is used to measure the gap between international student expectations and performance on service quality so that the UHC management can use the result to identify areas for improvement. This is because IPA assesses both strengths (keep up the good work) and potential drawbacks (concentrate here) (40,81). The IPA results are expected to offer a more realistic knowledge of prioritizing goals to improve the service quality of university health centers and an evidence-based plan for program creation (37,41,82).

According to our findings, there is an unmet need regarding student expectations and university health center performance. The University Health Center has opportunities to better align its services with student expectations, particularly regarding efficiency and equitable treatment. The result of this study is consistent with several published studies in hospitals and medical centers (37,38,78). However, it is essential to note that ideal situations, defined by perfection or optimality, are frequently difficult to achieve in practice. Realizing and understanding that achieving ideal conditions is frequently a complex and multifaceted endeavor is crucial. The ideal condition is subject to a variety of real-world constraints and limitations.

Although this study discovered a significant negative gap, the health center's service quality is recognized as strong compared to some other contexts, with opportunities to address particular unmet needs for further enhancement. Its findings are superior to other studies conducted in healthcare settings in several countries, including Brazil (39) and Iran (38,41,79). This indicates that the University Health Center provides better service when compared to

international providers. However, it is critical to note that the difference appears due to different target populations and the attributes used in the importance and performance component analysis. From the IPA analysis, this study also discovered that the highest and lowest values of the importance and performance factors were related to the safety and efficiency dimensions. This finding means that the center was very committed to ensuring high patient safety standards for international students. Patient safety is critical to primary care service quality (73,88). Maintaining consistently high cleanliness and safety standards is vital to ensuring a positive experience for all students.

On the other hand, efficiency remains a significant issue in the UHC. It can be seen from the results that examination waiting times have become the most prominent negative gap in the efficiency dimension, which may affect international student satisfaction with the service provided by the center. Long waiting times might be due to a lack of staff. According to the qualitative findings, a lack of staff, particularly the availability of GPs, may cause a delay in providing health services to students. This finding is supported by the lack of GPs, which is not limited to Hungarian primary health care. The GP shortage remains a significant issue throughout Europe. Several studies found that Europe's GP shortage may contribute to the primary care workforce crisis (96–98). Additionally, a study in Hungary found a significant decrease in GPs across all practices (98).

According to IPA analysis, the "Concentrate Here" quadrant (Q1) captured a single attribute for international students: "Health Workers treating every patient exactly the same" (item no. 6). This means that international students place a high value on equity in treating patients fairly, but perform poorly. This could refer to different cultural backgrounds. International students in Hungary encounter various new experiences and cultures that differ significantly from their home country. Several studies indicate that international students expect medical staff to treat them fairly regardless of their backgrounds (5,6,22). On the contrary, host country healthcare providers face difficulties in providing healthcare to international students due to language barriers, cultural differences, and limited resources (6,99).

## **5.2 Perceived Well-Being**

In this study, variables on the health and well-being of foreign students enrolled at Hungarian universities are investigated and identified. The outcome clarified and expanded upon the experiences of being an international student in Hungary, enabling Hungarian higher education establishments to better comprehend the obstacles faced by international students and the potential hazards to their health and well-being. We revealed that survey participants described well-being as multi-dimensional based on the qualitative results. This result is consistent with

a study conducted in the Netherlands, where college students identified several variables that affect their well-being (100). According to survey participants, academic priorities, preserving physical and mental health, social connections, and environmental connections are all aspects of well-being.

The desire to find better educational opportunities is regarded as an important concern when students decide to study abroad. International students' academic success will be impacted by their academic well-being, which includes their academic life, surroundings, support, and adjustment (101,102). In order to help students easily adjust to transition stress and shock, which may contribute to academic procrastination, it is crucial that the university, along with academic staff, psychologists, and other specialists, accompany and adapt students to new environments and reality (4,7,19,20,103). For this reason, adjusting to a university setting is essential to academic success.

Acculturative stress, which can result in anxiety and depression, may be brought on by challenges adjusting to the environment of the host nation (14,15). The mental well-being of students is seen to be crucial to the quality of education. Because they move to a new country and have to adjust to intercultural interactions, depression is the most prevalent mental health issue that arises among international students. To resolve such disputes, they must adjust (13,93,104,105). Symptoms of mental illness may arise from acculturative stress. Social support is one of the things that could shield overseas students from these detrimental consequences (49,105,106).

According to certain models, social connection is a key component of social support (91–93). In addition, increasing social support from a particular group of people, such as friends or family, can strengthen students and help improve their mental health conditions (49,107). International students who have a large network of friends with people in the host country will feel more satisfied and socially connected (49). It's crucial to have supportive social ties, and acceptance and connection are both necessary for one to feel like they belong (105,108).

Additionally, our quantitative investigation revealed that conditions for the well-being of international students at the University of Debrecen were generally favorable. In contrast to students from health-related colleges, students from non-health-related faculties may see an increase in well-being. The reason for this could be that compared to other training, health-related courses are more stressful (109–111). Several research has indicated that during their professional phases, nursing and medical students encounter elevated levels of stress (111,112). Stress can harm education by causing burnout (109,113), suicidal ideation, and even suicide in medical students (109).

The quantitative analysis also discovered that third-year students are less likely to experience an increase in well-being than first-year students. This tendency could be attributed to increased stress as a final-year student. Several studies have found that depression levels are highest in a student's final year of school (100,101). Final-year students in Canada have alarmingly high rates of anxiety and depression because they will no longer be able to access campus-based mental health services and will confront numerous additional stresses as a result of significant life transitions (114).

### **5.3 New Contribution to Academic Knowledge**

The study resulted in three publications that enrich the body of knowledge about the quality of healthcare service for improving the well-being of international students.

- 5.3.1 Study 1 title: International Students 'Perceived Quality of University Health Center Services: An Exploratory Sequential Mixed Methods Study. The study found the Empathy, Equity, Effectiveness, Efficiency, and Safety (4ES) Dimension to be considered a service quality indicator in the healthcare sector targeting a unique population. Additionally, the questionnaire developed from the qualitative study enriches the body of knowledge on measuring healthcare service quality in university healthcare settings.
- 5.3.2 Study 2 title: Understanding International Students 'Perspective of Health Service Quality: A Cross-Sectional Study in a Hungarian University. The study provides unique insights into international students' perceptions of healthcare services, particularly in a university setting. Novelty is found in the application of the Importance-Performance Analysis (IPA) method and thematic analysis of qualitative data to prioritize service quality dimensions and understand students' perspectives comprehensively.
- 5.3.3 Study 3 title: Exploratory Sequential Mixed-Method Study to Understand International Student's Perspective of Well-Being. The study presented new findings about indicators of international students' well-being namely: academic life, health, social connectedness, and environmental connection. In addition, the questionnaire developed from the qualitative study enriches the body of knowledge on measuring the well-being of international students.

### **5.4 Conclusion and Recommendation**

From this study, there are several conclusions can be drawn. Firstly, the study discovered five characteristics that could be used to improve healthcare services for international students. Patient safety is the most important aspect of perceived quality among international students at

the University Health Centre. Furthermore, being a Ph.D. student, studying in health-related institutions, and receiving a scholarship indicated the perceived quality of overseas students. As a result, the UHC administration and the university must increase the quality of services. Improvements must take into account the range of socio-demographic factors among international students. This would assist address the numerous challenges that international students encounter, particularly the disparities in primary care services and healthcare systems caused by social, historical, economic, and cultural reasons.

Secondly, the use of the IPA analysis matrix helps to identify major areas for improvement in the selected university health center's service based on international students' expectations. The importance and performance analysis provides valuable information about international students' feedback on the quality of service at the university health facility. There is a need for improvement and to minimize the importance-performance gaps, particularly in the efficiency component. Decision-makers can use the IPA analysis results to more effectively allocate limited resources, with a focus on potential organizational weaknesses for future direction. Lastly, this study found that international students believe that well-being has multiple dimensions. Well-being is linked to academic performance, health, social connections, and environmental stewardship. Furthermore, the quantitative research discovered that when gender, nationality, student status, faculty, and sponsorship were considered, only faculty and student status had a substantial impact on well-being. As a result, foreign students from non-health faculties are more likely to embrace improved well-being than their counterparts from health-related universities. Senior students are less likely to experience a rise in well-being than first-year students.

Thus, it would be effective for the University and other stakeholders involved in foreign student affairs to explore improved pre-arrival strategies that take into account the diversity of international students' socio-demographic features. Peer assistance from students from the same country or who have already finished the same course will improve the well-being of international students.

## **6. Summary**

This thesis investigates the perceived quality of healthcare services and the well-being of international students while living and studying in Debrecen, Hungary. A body of literature indicates that due to the shift to the new environment, international students are prone to have varied degrees of physical and psychological adjustment which will affect their well-being. According to studies, overseas students are more likely to have poor mental health, which is exacerbated by separation from family and culture, language obstacles, financial hardship, and

academic obligations. To enable overseas students to complete their degrees and reach their desired level of achievement and performance, the university will need to support them in a variety of ways including providing and improving access to high-quality healthcare services. This thesis resulted in three publications. The first one found five major themes representing the study participants' thoughts about the quality of services in the university healthcare context. Perceived quality attributes identified in this study were primarily Empathy, Equity, Effectiveness, Efficiency, and Safety. It also found that only 35.57% of study participants consider the perceived quality of the university health centre as good. The highest and lowest service quality attributes were related to safety and efficiency, with a score of  $21.12 \pm 3.58$  and  $19.57 \pm 4.34$ , respectively. The multiple linear regression analysis showed that PhD students from Health Faculty and Scholarship awardees were significantly associated with the perceived quality of health care services.

The second article found the gaps between the importance and performance of service quality were negative in all service quality dimensions (P-value < 0.001). This suggests that there is an unmet need for student expectations and university health center performance. From the Importance factor, the highest and lowest were related to safety ( $4.54 \pm 0.56$ ) and efficiency ( $4.31 \pm 0.66$ ) dimensions. The Performance factor's highest and lowest mean scores were also related to safety ( $4.22 \pm 0.72$ ) and efficiency ( $3.91 \pm 0.87$ ), respectively. From qualitative analysis, the study also found that there are two major themes several secondary themes emerged from the thematic analysis of free-text responses. Thematic analysis of qualitative data provides a comprehensive understanding of service quality dimensions and understands students' perspectives comprehensively.

The third article found four main themes depicting international students' perception of well-being. Perceived well-being identified namely academic life, health, social connectedness, and environmental connection. The quantitative study suggests that faculty and student status significantly affect international students' well-being.

The findings of this study may assist decision-makers in identifying the well-being of international students by identifying their attitudes toward health and well-being, as well as their perceptions of the quality of healthcare services. It will also improve comprehension of the strengths and weaknesses of service quality as determined by importance and performance analysis. The findings can also help decision-makers improve service quality and student satisfaction by concentrating on service users' perspectives. Finally, it may assist healthcare

management in better understanding patient attitudes and expectations from various cultural backgrounds.

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Candidate: Putu Ayu Indrayathi  
Doctoral School: Doctoral School of Health Sciences

### List of publications related to the dissertation

1. **Indrayathi, P. A.**, Januraga, P. P., Ulandari, L. P. S., Pradnyani, P. E., Ramadhan Makame, K., Elehamer, N. M. K., Hilal, S., Kirshbaum, M., Kolozsvári, L. R.: International students' perceived quality of university health centre services: an exploratory sequential mixed methods study.  
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*Risk Manag Healthc Policy.* 17, 1757-1769, 2024.  
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### List of other publications

3. Kovács, E., Rekenyi, V., Nánási, A., Szepesi, C. I., **Indrayathi, P. A.**, Horváth, N., Csirmaz, A., Marjai, G., Kolozsvári, L. R.: Lifestyle Medicine in Focus: a Cross-Sectional Study Comparing Domestic and International Students.  
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