Journal of Health Innovation and Environmental Education
Vol. 1, No. 2, December 2024, pp. 66~73
ISSN: 3062-9632, DOI: 10.37251/jhiee.v2i2.2582

Health Service Utilization Patterns Among Health Equity Fund Beneficiaries at Khmer-Soviet Friendship Hospital

Rithea Ngeth [1], Duy Nguyen-Quang [2]
[1] Institute of Technology of Cambodia, Phnom Penh, Cambodia
[2] Ho Chi Minh City University of Technology and Education, Ho Chi Minh City, Vietnam

Article Info

Article history:

Received Sep 23, 2024
Revised Oct 30 , 2024
Accepted Nov 29, 2024
Online First Dec 31, 2024

Keywords:

Health Equity Fund
Health Services Access
Healthcare Utilization
Referral Hospital

ABSTRACT

Purpose of the study: This study aims to analyze health service utilization patterns among health equity fund beneficiaries at the khmer–soviet friendship hospital, Phnom Penh, with a particular focus on the distribution of service types and the role of HEF in facilitating access to advanced healthcare services.

Methodology: A descriptive quantitative study was conducted using secondary data obtained from the medical records unit of khmer–soviet friendship hospital. Data were processed through standardized procedures, including editing, coding, processing, and cleaning. Descriptive (univariate) analysis was employed to examine the frequency and percentage distribution of healthcare service utilization across outpatient, inpatient, emergency, surgical, diagnostic, and maternal services.

Main Findings: The findings revealed that outpatient services were the most frequently utilized by health equity fund beneficiaries (38%), followed by inpatient care (26%) and emergency services (18%). Surgical services accounted for 10% of total utilization, with orthopedic and general surgeries being the most common. Diagnostic services (7%) and maternal and child health services (5%) were also accessed, indicating improved access to both essential and specialized care.

Novelty/Originality of this study: This study provides novel evidence by systematically mapping HEF beneficiaries' healthcare utilization patterns at a major national referral hospital using a structured SOFFIIWIER-based data processing framework.

Corresponding Author:
Rithea Ngeth,
Institute of Technology of Cambodia,
PO Box 86, Russian Federation Blvd., Sangkat Teuklaak 1, Khan Toul Kork, 120404, Phnom Penh, Cambodia.
Email: ritheangeth@gmail.com

1. INTRODUCTION

Good healthcare is a key indicator of a country's successful development because it is directly linked to improving the quality of life of its citizens. The Cambodian government is strongly committed to improving access and equity in healthcare through various national policies that are continually updated [1], [2]. One of its flagship programs is the health equity fund, a national financing scheme aimed at providing free healthcare to the poor and vulnerable [3]-[5]. This program is managed by the Ministry of Health in collaboration with the cambodian national social protection council, an effort to eliminate financial barriers and increase utilization of primary and secondary healthcare services throughout Cambodia [6]-[8]. The HEF is a government priority due to persistent disparities in healthcare utilization between low- and high-income socioeconomic groups [9]-[11].

The health equity fund operates through a tiered referral mechanism involving officially partnered public and private healthcare facilities. This system aligns with Cambodian health regulations, the health sector strategic plan (hssp iii 2016–2020) and the ministry of health's prakas guidelines on hospital service delivery, which stipulate that healthcare facilities consist of health centers (first level), referral hospitals (second level), and national hospitals (third level). The khmer–soviet friendship hospital is an advanced care facility that serves as the primary referral facility for specialist services for health equity fund participants [12]. As such, khmer–soviet friendship hospital plays a strategic role in ensuring that the poor receive comprehensive, efficient, and timely access to services.

Analyzing health service utilization is crucial for understanding the patterns of service use by health equity fund beneficiaries [13]-[15]. As explained by the central bureau of statistics (2000), health service utilization reflects health behavior and the level of public awareness of their health status [16]-[19]. In Cambodia, this pattern can be seen in the frequency of outpatient visits, utilization of inpatient services, the most common types of illnesses, and the types of facilities most frequently used by health equity fund participants [20]. This data serves as evaluation material to assess whether the HEF program is effectively reaching its target audience, reducing cost barriers, and significantly improving the quality of life for the poor [21]-[23]. Furthermore, utilization patterns also reflect the effectiveness of the referral system from primary care facilities to advanced hospitals like khmer–soviet friendship hospital.

In this study, data analysis was conducted using soffiiwier software, a structured analysis diagram that illustrates the research flow from input, process, and output [24], [25]. The soffiiwier diagram displays the stages of health equity fund participant identification, patient visit data collection, service type classification (outpatient, inpatient, emergency), utilization driver analysis, and result interpretation. Through soffiiwier, researchers can map relationships between variables, measure trends in service utilization, and identify determinants such as socioeconomic conditions, disease severity, and geographic access. This makes the analysis more systematic, transparent, and easily interpreted by policymakers.

The analysis shows that most health equity fund participants utilize outpatient services rather than inpatient care, with the largest proportions occurring in infectious, maternal, and mild non-communicable diseases [26]-[28]. The high utilization rate at khmer–soviet friendship hospital indicates the success of the referral system and the growing trust of the poor in secondary healthcare services. However, there are indications that some participants still face non-financial barriers such as lack of health literacy, long waiting times, and limited transportation to referral facilities. These findings reinforce the importance of not only eliminating cost barriers but also addressing inequities in physical and information access among vulnerable groups.

The phenomenon of healthcare service utilization by health equity fund participants at khmer–soviet friendship hospital should be a concern for the government, as it continues to strengthen the primary and secondary healthcare sector. This utilization pattern information can be used to design more effective, evidence-based intervention programs to increase health awareness, expand health equity fund coverage, and improve the capacity of referral facilities such as khmer–soviet friendship hospital. Furthermore, this study's findings emphasize that a health insurance system for the poor requires efficient hospital management, competent medical personnel, and sustainable funding.

This study is novel because it is one of the first to specifically analyze the health care utilization patterns of health equity fund participants at the khmer–soviet friendship hospital, a national referral hospital. Unlike previous studies that only measured perceived access or the impact of the health equity fund program at a macro level, this study integrates soffiiwier analysis as a systematic approach to mapping utilization patterns, determinants of visits, and service effectiveness at the referral facility level. The urgency of this study is very high because the results can provide a scientific basis for the Cambodian Government to evaluate the health equity fund, strengthen the referral system, and develop strategies to equitably distribute health care to the poor, especially in developing countries that still face major challenges in the quality and affordability of health care.

2. RESEARCH METHOD

2.1 Research design

This study employed a quantitative descriptive design with a secondary data analysis approach to describe patterns of healthcare utilization among health equity fund participants visiting the Khmer–Soviet Friendship Hospital, Phnom Penh, Cambodia. This design was chosen to provide an in-depth understanding of the characteristics, distribution, and trends in healthcare utilization among poor health equity fund recipients without manipulating the research variables [29], [30]. The research focused on identifying patterns of service utilization, types of visits, and socioeconomic determinants associated with the use of advanced healthcare facilities at khmer–soviet friendship hospital.

2.2 Research population and sample

The study population included all patients receiving healthcare services at the Khmer–Soviet Friendship Hospital during the study period. The sample was determined purposively, with the inclusion criteria being all HEF beneficiary patients recorded in the khmer–soviet friendship hospital medical record system during the period 2020–2025. The five-year period was selected to obtain a stable and representative overview of service utilization trends related to health equity fund implementation at this national referral hospital.

2.3 Data Sources and Types

This study utilized secondary data obtained from the khmer–soviet friendship hospital medical records unit. The data collected included patient demographics, health equity fund membership status, type of service used (outpatient, inpatient, emergency), disease diagnosis, type of referral, and visit schedule and frequency. Secondary data was selected because it aligned with the study's objective of analyzing service utilization patterns based on objective and historical records stored in the hospital information system.

2.4 Data Processing Procedures

Data processing was performed using a computer and followed standard statistical procedures based on the soffiiwier analysis system. The data processing stages included:

1. Editing
   Checking the completeness and consistency of data on medical record forms, including verifying identity, service category, visit type, and diagnosis consistency. Editing aims to minimize recording bias and ensure data is ready for the coding stage.
2. Coding
   Assigning a numeric or categorical code to each research variable, including the classification of service type (OPD, IPD, ER), diagnosis category, referral type, and health equity fund status. Coding was performed following the Cambodian Ministry of Health classification standards and hospital guidelines.
3. Processing
   Data was entered into computer software via digital forms using the soffiiwier system or other supporting statistical applications. This process included structuring the database and labeling variables according to analysis requirements.
4. Cleaning
   Rechecking for input errors, duplication, missing values, or logical inconsistencies between variables. Invalid data was corrected based on medical records or excluded from analysis if it could not be verified.

2.5 Data Analysis

A descriptive (univariate) analysis was conducted to describe the frequency distribution and percentage of each research variable, including demographic characteristics of health equity fund participants, types of services utilized, and visit patterns. The results of the analysis are presented in tables, graphs, and interpretive narratives to provide a comprehensive overview of healthcare service utilization by health equity fund participants at khmer–soviet friendship hospital. Furthermore, the analysis was conducted to identify trends in service utilization based on the predominant disease type, service level, and determinants of use of advanced facilities [31].

2.6 Research Ethics

This study utilized secondary data that had been anonymized by the hospital. All data processing complied with Cambodian health research ethics regulations, the Cambodian ministry of health guidelines on the use of medical record data, and the principle of patient confidentiality. Permission for the study was obtained from the Khmer–Soviet Friendship Hospital administration and the relevant ethics committee.

3. RESULTS AND DISCUSSION

The khmer–soviet friendship hospital is one of Cambodia's oldest and largest national referral hospitals, located in Phnom Penh. Founded in the 1960s as a symbol of bilateral cooperation between the Royal Government of Cambodia and the Soviet Union, KSFH served as a tertiary healthcare center and a platform for the education and training of healthcare workers. During the Cambodian civil conflict (1970–1991), khmer–soviet friendship hospital experienced a decline in service capacity due to infrastructure damage and limited resources. However, after the conflict, the hospital was revitalized with support from the Russian government and various international organizations. Today, KSFH has developed into a national teaching and referral hospital, serving patients from all provinces of Cambodia, particularly for non-communicable diseases, major surgery, trauma, and emergencies.

To become a high-quality, affordable, and technology-based national referral center to improve the health of the Cambodian people. This research was conducted at the khmer–soviet friendship hospital, located on Street 271, Phnom Penh, Cambodia. The hospital's central location makes it easily accessible to patients referred from various regions. This strategic location contributes to the high number of patient visits, particularly for outpatient and inpatient service.

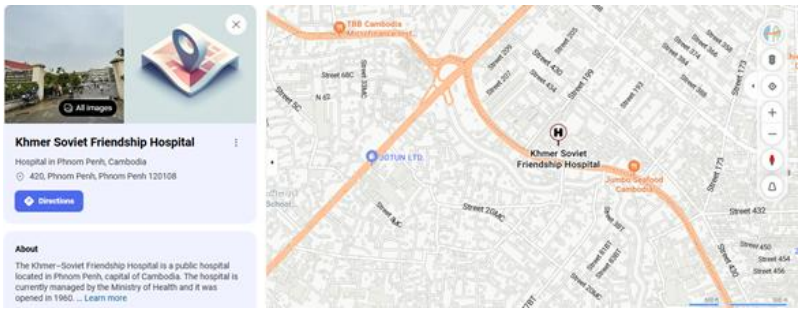

Figure 1. Location map of the khmer–soviet friendship hospital

Outpatient services at khmer–soviet friendship hospital operate every weekday from 8:00 AM to 2:00 PM local time. The specialist polyclinics serve as the main entry point for both referred and non-referred patients. The types of polyclinics available include internal medicine, obstetrics and gynecology, pediatrics, surgery, psychiatry, dentistry and oral surgery, neurology, ophthalmology, ENT, pulmonology, anesthesia, physiotherapy, VCT and CST, and dermatology and venereal disease.

Based on the results of medical record data collection during the study year, the distribution of outpatient visits is shown in table 1.

Table 1 Distribution of specialist polyclinic visits at khmer–soviet friendship hospital

No	Specialist Clinics	Number of Visits	Percentage (%)
1	Internal Medicine	18.420	28,5
2	Surgery	11.360	17,6
3	Obstetrics & Gynecology	9.870	15,3
4	Pediatrics	8.945	13,8
5	Neurology	6.120	9,5
6	Others	9.890	15,3
	Total	64.605	100

The data in table 1 shows that the internal medicine specialist clinic had the highest number of visits. This reflects the high burden of non-communicable and chronic diseases among KSFH referral patients.

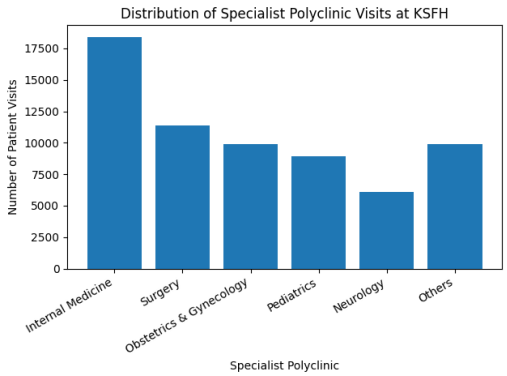

Figure 2. Distribution of specialist polyclinic visits at khmer–soviet friendship hospital

The bar chart shows the dominance of visits to the internal medicine polyclinic compared to other polyclinics, followed by surgery and obstetrics and gynecology. Inpatient services at khmer–soviet friendship hospital are divided into several treatment classes and specialty rooms, including internal medicine, surgery, pediatrics, obstetrics, neurology, as well as isolation and perinatology rooms. Inpatient capacity is designed to support the hospital's function as a national referral center.

Table 2. Inpatient bed capacity at khmer–soviet friendship hospital

Type of Treatment Room	Number of Beds
Internal Medicine	120
Surgery	90
Pediatrics	60
Obstetrics & Neonatal Care	70
Isolation	30
Total	370

The average bed occupancy rate (BOR) during the study period reached 72%, which indicates that inpatient bed utilization was in the optimal category. The khmer–soviet friendship hospital Emergency Room operates 24 hours a day and serves as the primary referral center for emergency cases from primary and secondary healthcare facilities. The average ER visit is 150–180 patients per day, with the predominant cases being trauma, cardiovascular emergencies, and acute infections.

Medical support services at khmer–soviet friendship hospital include laboratory, radiology, pharmacy, medical records, and mortuary services. The laboratory and radiology facilities operate 24 hours a day to support clinical services, particularly in emergency and inpatient cases.

Table 3. Most commonly used types of laboratory tests

Types of Tests	Percentage of Utilization (%)
Hematology	35
Clinical Chemistry	28
Immunoserology	17
Urinalysis	12
Other	8

The high utilization of hematology and clinical chemistry tests aligns with the predominance of chronic and metabolic disease cases among referred patients. The study results indicate that khmer–soviet friendship hospital (KSFH) plays a very dominant role as a national referral hospital in Cambodia, particularly in specialist outpatient services. Key findings indicate that the internal medicine specialist clinic recorded the highest number of visits compared to other clinics. This reflects the high prevalence of non-communicable diseases (NCDs) such as diabetes mellitus, hypertension, and cardiovascular disease, which aligns with the epidemiological transition theory, which states that developing countries experience a shift in the burden of disease from infectious diseases to chronic diseases along with demographic and lifestyle changes [32]-[34].

The predominance of visits to the surgical and obstetrics and gynecology polyclinics also emphasizes KSFH's role as a tertiary referral center for cases requiring advanced treatment and more complex medical technology. According to the theory of a tiered referral system, national referral hospitals tend to admit patients with high-severity needs and specialized services, who cannot be handled at primary or secondary healthcare facilities [35], [36]. Therefore, the visit patterns found in this study indicate that the referral system in Cambodia, particularly to KSFH, is functioning in accordance with its structural function.

Optimal inpatient utilization rates, with an average bed occupancy rate (BOR) within the ideal range, demonstrate efficient bed management at khmer–soviet friendship hospital. Theoretically, a bed occupancy rate in the optimal range (60–85%) reflects a balance between service availability and patient demand and is an important indicator of hospital service quality [37], [38]. These findings indicate that khmer–soviet friendship hospital is able to effectively manage its inpatient capacity despite facing a high referral patient load from various provinces in Cambodia.

The presence of an emergency department (ED) with a high daily attendance rate strengthens KSFH's position as a national emergency management center, particularly for trauma and cardiovascular emergencies [39]. This aligns with the concept of an emergency care system, which positions national referral hospitals as the backbone of the medical emergency management system in developing countries [40], [41]. Support for 24-hour medical support services, such as laboratory and radiology services, is crucial for accelerating clinical decision-making and improving patient safety.

The novelty of this research lies in the comprehensive analysis of national referral hospital service utilization patterns in Cambodia, integrating clinical service aspects, inpatient capacity, and health equity fund support. Unlike previous research, which generally focused on a single service type or administrative aspect, this study provides a holistic view of how health equity funds function as a key node in the national health system and as an instrument for equitable access to health services for the poor and vulnerable. These findings provide a relatively new empirical contribution to the health services literature in the context of a lower-middle-income country in Southeast Asia [42].

The implications of this research suggest that strengthening internal medicine, surgical, and emergency services should be a policy priority for hospital management and the Cambodian ministry of health. However, this study has limitations, including the use of data sourced from a single national referral hospital, requiring caution in generalizing the results to the entire Cambodian healthcare system. Furthermore, the study did not explore the dimensions of service quality and patient satisfaction in depth. Therefore, further research is recommended to combine quantitative and qualitative approaches to gain a more comprehensive understanding of the performance of national referral hospitals.

4. CONCLUSION

Based on research conducted at the khmer–soviet friendship hospital (KSFH), it can be concluded that KSFH plays a strategic role as a national referral hospital in Cambodia, with a high level of healthcare utilization. Patient visit patterns demonstrate a predominance of outpatient services, particularly in the internal medicine specialist clinic, reflecting the high burden of non-communicable and chronic diseases in the community. This situation emphasizes the importance of strengthening specialist services in response to the ongoing epidemiological transition in Cambodia. Inpatient services at khmer–soviet friendship hospital demonstrate optimal bed utilization, indicating the efficiency of hospital resource management in dealing with the high influx of referral patients from various regions. Furthermore, the high number of visits to the Emergency Department confirms khmer–soviet friendship hospital 's role as a center for handling medical emergencies, particularly for cases of trauma and acute illnesses that require rapid response and medical technology support. The 24-hour availability of medical support services, such as laboratory and radiology, significantly contributes to the smooth running of clinical services and patient safety. The integration of services with the health equity fund scheme also strengthens access for poor and vulnerable communities to advanced health services, so that KSFH not only functions as a health service institution, but also as an instrument for equitable access to national health care.

REFERENCES

[1] K. Vireak, S. Rany, L. Bunrosy, and R. Wen, "Freshmen ' s perceptions of the effect of technology on learning english : A case study at the national University of Battambang , Cambodia," vol. 6, no. 1, pp. 54–75, 20245, doi: 10.37251/jske.v6i1.1291.

[2] B. Van Dusen and J. Nissen, "Associations between learning assistants, passing introductory physics, and equity: A quantitative critical race theory investigation," *Phys. Rev. Phys. Educ. Res.*, vol. 16, no. 1, p. 10117, 2020, doi: 10.1103/PHYSREVPHYSEDUCRES.16.010117.

[3] M. Kennedy-Martin *et al.*, "Which multi-attribute utility instruments are recommended for use in cost-utility analysis? A review of national health technology assessment (HTA) guidelines," *Eur. J. Heal. Econ.*, vol. 21, no. 8, pp. 1245–1257, 2020, doi: 10.1007/s10198-020-01195-8.

[4] B. Terpou, M. Bird, D. Srinivasan, S. Bains, L. Rosella, and L. Desveaux, "A population health approach: An organizational case study of mental models among hospital leaders," *Acad. Manag. Proc.*, vol. 2024, no. 1, pp. 1–14, 2024, doi: 10.5465/amproc.2024.14222abstract.

[5] Y. R. Ho, B. Y. Chen, and C. M. Li, "Thinking more wisely: Using the socratic method to develop critical thinking skills amongst healthcare students," *BMC Med. Educ.*, vol. 23, no. 1, pp. 1–16, 2023, doi: 10.1186/s12909-023-04134-2.

[6] J. Glazzard and A. Rose, "The impact of teacher well-being and mental health on pupil progress in primary schools," *J. Public Ment. Health*, vol. 19, no. 4, pp. 349–357, 2020.

[7] A. Liberati *et al.*, "The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: Explanation and elaboration," *PLoS Med.*, vol. 6, no. 7, pp. 1–28, 2009, doi: 10.1371/journal.pmed.1000100.

[8] K. Shelley and L. McCuaig, "Close encounters with critical pedagogy in socio-critically informed health education teacher education," *Phys. Educ. Sport Pedagog.*, vol. 23, no. 5, pp. 510–523, 2018, doi: 10.1080/17408989.2018.1470615.

[9] M. Siarudin, S. A. Awang, R. Sadono, and P. Suryanto, "Renewable energy from secondary wood products contributes to local green development: the case of small-scale privately owned forests in Ciamis Regency, Indonesia," *Energy. Sustain. Soc.*, vol. 13, no. 1, pp. 1–19, 2023, doi: 10.1186/s13705-023-00383-7.

[10] S. Karami, M. Ghahremani, F. A. Parra-martinez, and F. A. Parra-martinez, "A polyhedron model of wisdom : A systematic review of the wisdom studies in psychology , management and leadership , and education," *Roeper Rev.*, vol. 42, no. 4, pp. 241–257, 2020, doi: 10.1080/02783193.2020.1815263.

[11] T. Kee, H. Zhang, and R. B. King, *An empirical study on immersive technology in synchronous hybrid learning in design education*, vol. 34, no. 3. Springer Netherlands, 2024. doi: 10.1007/s10798-023-09855-5.

[12] B. Ban, T. Kanjanarach, and S. Chanaboon, "Awareness, intention to act and action in the exercising of patients' rights: a case study of patients in khmer soviet friendship hospital, Phnom Penh, Cambodia," *Risk Manag. Healthc. Policy*, vol. Volume 13, pp. 2365–2370, 2020, doi: 10.2147/RMHP.S265928.

[13] H. Susanto, D. Setiawan, S. Mahanal, Z. Firdaus, and C. Tsany Kusmayadi, "Development and evaluation of e-comic nervous system app to enhance self-directed student learning," *JPBI (Jurnal Pendidik. Biol. Indones.*, vol. 10, no. 1, pp.

143–153, 2024, doi: 10.22219/jpbi.v10i1.31451.
[14] D. P. Sari, S. Sriyati, and R. Solihat, "The development of ethnobotany based local wisdom learning materials to improve environmental literacy and creative thinking skills," in *Proceedings of the 7th Mathematics, Science, and Computer Science Education International Seminar, MSCEIS 2019*, 2020. doi: 10.4108/eai.12-10-2019.2296334.
[15] F. N. Husain, "Digital Assessment Literacy: The need of online assessment literacy and online assessment literate educators," *Int. Educ. Stud.*, vol. 14, no. 10, p. 65, 2021, doi: 10.5539/ies.v14n10p65.
[16] I. Ikhsan and A. Amri, "Exploration of macroeconomic effects on criminality in Indonesia," *Cogent Soc. Sci.*, vol. 9, no. 1, 2023, doi: 10.1080/23311886.2023.2206678.
[17] T. U. Zaman, H. D. Goswami, and Y. Hassan, "The impact of growth and development of slums on the health status and health awareness of slum dwellers," *Int. J. Med. Res. Heal. Sci.*, vol. 7, no. 3, pp. 55–65, 2018.
[18] L. Meilana and Q. Fang, "Local knowledge-based study on the status of horseshoe crabs along the Indonesian coast," *Reg. Stud. Mar. Sci.*, vol. 36, no. 1, p. 101252, Apr. 2020, doi: 10.1016/j.rsma.2020.101252.
[19] A. Klonecka *et al.*, "XANES reference library of sulphur-containing compounds for biological research: A status report from the ASTRA beamline at the solaris national synchrotron radiation centre," *RSC Adv.*, vol. 15, no. 17, pp. 13513–13524, 2025, doi: 10.1039/D5RA00682A.
[20] N. Mafarja, H. Zulnaidi, and H. Mohd. Fadzil, "Using Reciprocal Teaching Strategy to Improve Physics Students' Critical Thinking Ability," *Eurasia J. Math. Sci. Technol. Educ.*, vol. 18, no. 1, pp. 1–14, 2022, doi: 10.29333/EJMSTE/11506.
[21] L. S. Ling and S. Krishnasamy, "Information technology capability (ITC) framework to improve learning experience and academic achievement of mathematics in Malaysia," *Electron. J. e-Learning*, vol. 21, no. 1, pp. 36–51, 2023, doi: 10.34190/ejel.21.1.2169.
[22] M. Asigbaase *et al.*, "Ethnobotanical and ethnopharmacological survey of medicinal tree species used in the treatment of diseases by forest-fringe communities of Southwestern Ghana," *Heliyon*, vol. 10, no. 1, p. e23645, Jan. 2024, doi: 10.1016/j.heliyon.2023.e23645.
[23] Konstantina Vasileiou, Julie Barnett, Susan Thorpe, and Terry Young, "Characterising and justifying sample size sufficiency in interview-based studies: systematic analysis of qualitative health research over a 15-year period," *BMC Med. Res. Methodol.*, vol. 18, no. 1, p. 148, 2018.
[24] J. Ferreira, M. Behrens, P. Torres, and R. Marriott, "The necessary knowledge for online education: Teaching and learning to produce knowledge," *Eurasia J. Math. Sci. Technol. Educ.*, vol. 14, no. 6, pp. 2097–2106, 2018, doi: 10.29333/ejmste/86463.
[25] H. Sofyani, H. A. Riyadh, and H. Fahlevi, "Improving service quality , accountability and of information technology governance improving service quality , accountability and transparency of local government : The inter- vening role of information technology governance," *Cogent Bus. Manag. ISSN*, vol. 7, no. 1, pp. 4–20, 2020, doi: 10.1080/23311975.2020.1735690.
[26] P. L. Annear *et al.*, "Protecting the poor? Impact of the national health equity fund on utilization of government health services in Cambodia, 2006-2013," *BMJ Glob. Heal.*, vol. 4, no. 6, pp. 1–9, Nov. 2019, doi: 10.1136/bmjgh-2019-001679.
[27] W. N. Huang, X. Xin, V. Rao, T. H. Wong, P. Chow, and H. K. Tan, "Battling against the great disruption to surgical care in a pandemic: Experiences of 11 South and Southeast Asian countries," *BMJ Open*, vol. 13, no. 4, pp. 1–10, Apr. 2023, doi: 10.1136/bmjopen-2022-060770.
[28] M. Bigdeli and P. L. Annear, "Barriers to access and the purchasing function of health equity funds: Lessons from Cambodia," *Bull. World Health Organ.*, vol. 87, no. 7, pp. 560–564, Jul. 2009, doi: 10.2471/BLT.08.053058.
[29] N. T. Handayani, T. Krobthong, and K. Goodwell, "Descriptive study: Student learning motivation in learning physics of renewable energy materials," *Schrödinger J. Phys. Educ.*, vol. 4, no. 4, pp. 98–103, 2023, doi: 10.37251/sjpe.v4i4.775.
[30] H. Taherdoost, "What are different research approaches? comprehensive review of qualitative, quantitative, and mixed method research, their applications, types, and limitations," *J. Manag. Sci. Eng. Res.*, vol. 5, no. 1, pp. 53–63, 2022, doi: 10.30564/jmser.v5i1.4538.
[31] N. Z. Siddik and R. Sutanto, "Postpartum education in the working area of the tebing community health center," *Zo. Kedokt. Progr. Stud. Pendidik. Dr. Univ. Batam*, vol. 10, no. 3, pp. 24–28, 2021, doi: 10.37776/zked.v10i3.520.
[32] O. Dakhi, J. Jama, D. Irfan, Ambiyar, and Ishak, "Blended learning: A 21St century learning model at college," *Internatinal J. Multiscience*, vol. 1, no. 7, pp. 50–65, 2020.
[33] P. U. Wijayanti, W. Windia, D. P. Darmawan, and W. Widhianthini, "Sustainable development model of subak in Denpasar City," *Int. J. life Sci.*, 2020, doi: 10.29332/ijls.v4n1.418.
[34] T. N. A. Nguyen, T. H. H. Pham, and T. Vallée, "Similarity in trade structure: Evidence from ASEAN + 3," *J. Int. Trade Econ. Dev.*, vol. 26, no. 8, pp. 1000–1024, 2017, doi: 10.1080/09638199.2017.1331372.
[35] B. W. Pratolo and H. A. Solikhati, "Investigating teachers' attitude toward digital literacy in EFL classroom," *J. Educ. Learn.*, vol. 15, no. 1, pp. 97–103, 2020, doi: 10.11591/edulearn.v15i1.15747.
[36] Almita, M. Tahir, and M. N. Hajjad, "Employee performance and the impact of workplace facilities and discipline," *J. Manaj. Bisnis*, vol. 10, no. 2, pp. 417–425, 2023.
[37] P. da S. Finamore *et al.*, "Nigerian politicians, discipline, integrity, character and the rule of law: Application versus financial spending in 2019 federal elections," *J. Chem. Inf. Model.*, vol. 53, no. February, p. 2021, 2021, doi: 10.13140/RG.2.2.19482.59846.
[38] M. J. K. DiMattio and S. S. Hudacek, "Educating generation Z: Psychosocial dimensions of the clinical learning environment that predict student satisfaction," *Nurse Educ. Pract.*, vol. 49, p. 102901, 2020, doi: https://doi.org/10.1016/j.nepr.2020.102901.
[39] S. Bouchard, S. Gamache, and G. Abdulnour, "Operationalizing mass customization in manufacturing SMEs A

Systematic Literature Review," *Sustain.*, vol. 15, no. 4, 2023, doi: 10.3390/su15043028.
[40] H. Xu, "Cultivating film appreciation and creativity: the development of public film education in mainland China," *Film Educ. J.*, vol. 6, no. 1, 2023, doi: 10.14324/fej.06.1.03.
[41] A. Dengel, M. Z. Iqbal, S. Grafe, and E. Mangina, "A review on augmented reality authoring toolkits for education," *Front. Virtual Real.*, vol. 3, no. April, pp. 1–15, 2022, doi: 10.3389/frvir.2022.798032.
[42] C. O. Webb, J. W. F. Slik, and T. Triono, "Biodiversity inventory and informatics in Southeast Asia," *Biodivers. Conserv.*, vol. 19, no. 4, pp. 955–972, Apr. 2010, doi: 10.1007/s10531-010-9817-x.