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Healing the eyes of the Indies: Circulating and localizing European ophthalmological knowledge and technology in twentieth-century Yogyakarta

Abstract. *This research explores the emergence of ophthalmological practices in Yogyakarta, specifically within the realm of hospital practice. By focusing on the Prinses Juliana Gasthuis voor Ooglijders, this study analyzes the circulation and localization of European ophthalmological knowledge and technology within a colonial context. The investigation involved a thorough review of archival documents, including colonial and hospital reports, alongside an examination of the brands and origins of medical devices currently preserved at the Museum of Dr. Yap Prawirohusodo. The analysis utilizes David Arnold’s framework, which highlights*

intercultural exchange, regional circulation, and the hybridization of European knowledge and technology within a colony. The Prinses Juliana Gasthuis voor Ooglijders (Princess Juliana Hospital for Eye Disease Patients) was established in 1923 by Dr. Yap Hong Tjoen, a Chinese-Indonesian ophthalmologist who earned his doctorate from the University of Leiden. For this reason, his European education integrated him into a global network of medical expertise. He played a pivotal role in circulating ophthalmological knowledge and technology upon returning to the Dutch East Indies to work at the hospital. While he applied standardized European diagnoses and treatments for eye care, he simultaneously adapted this knowledge to local contexts by translating unfamiliar Western concepts for indigenous patients. Furthermore, the analysis of medical devices reveals a significant influx of imported equipment from Europe to Yogyakarta, underscoring the existence of a robust transnational network. Interestingly, the research also uncovers evidence of modification and self-fabrication, particularly regarding Snellen charts, wheelchairs, and medicine-compounding equipment. Such adaptations provide insight into how technology was tailored to suit local needs shaped by social, cultural, and physical factors. Ultimately, this study contributes to the historiography of medicine in the Dutch East Indies by examining the role of local agencies and the materiality of medical technology. It also underscores the significance of indigenous environments in the global dissemination and practical application of European medical science.

Keywords: *Prinses Juliana Gasthuis voor Ooglijders; colonial medicine; medical knowledge; medical technology; local adaptation; Museum of Dr. Yap Prawirohusodo*

Introduction.

This article examines the circulation and localization of European medical knowledge and technology in the Dutch East Indies, now modern-day Indonesia, by focusing on a specific case study of ophthalmology in Yogyakarta. This process began with the arrival of European influence, which fundamentally altered medical practice. Although these medical advancements initially served as a means of asserting colonial power and safeguarding military and government personnel (Boomgaard, 1993), they eventually introduced innovative approaches to disease diagnosis and therapeutic practices. Established through medical institutions (Baha'uddin, 2005; Boomgaard, 1993; Kurniawan & Agustia, 2021; Pols, 2018; van Bergen, 2024), medical education (Hesselink, 2011; Pols, 2024), and public health policy (Baha'uddin, 2005, 2006; van Bergen et al., 2017), European medicine effectively reshaped medical practice throughout the colonial setting.

The dynamics of European medicine in the Dutch East Indies have received considerable scholarly attention. Previous studies by Baha'uddin (2005), Boomgaard (1993), Kurniawan & Agustia (2021), Van Bergen (2024), and Zondervan (2016)

provide a comprehensive historical overview of medical institutions. These organizations originated with the Military Medical Services (MMS) in the early 19th century. Subsequently, the Civil Medical Services (CMS) was established as a separate entity from the MMS in 1911, eventually transitioning into the Public Health Services (PHS) in 1925. Furthermore, Baha'uddin (2005) analyzes how shifts in medical policy directly affected healthcare delivery. He notes that discriminatory public health policies in the 19th century led to substandard care for the general population. Conversely, early 20th-century reforms and the CMS introduced systematic care through subsidies and the construction of new hospitals. Additionally, Bergen et al. (2017) studied regional healthcare services by examining the archives of *Geneeskundig Tijdschrift voor Nederlandsch-Indie* (the Medical Journal of the Dutch East Indies) from 1852 to 1942. Their research details the political and socioeconomic influences on healthcare, the organization of medical services, hospital development, key medical figures, and various disease treatment methods utilized during that era.

While the aforementioned studies focused on how European influence affected various aspects of medicine in this region, other research has concentrated on the interaction between European and traditional medicine. Boomgaard (1993) examined the development of colonial healthcare in Java and the confrontation between Western and indigenous medical practices. This investigation reveals a new medical phenomenon that is neither fully Western nor fully Eastern, as exemplified by the evolution of nursing. Similarly, research by Pols (2024) investigated the development of medical education in the Dutch East Indies and Indonesia by focusing on the establishment of medical courses for indigenous students. The study reveals the rise of a culturally hybrid Indonesian medical profession that closely mirrored its European counterpart, thereby occupying a liminal position within colonial society (Pols, 2024, p. 181). Accordingly, these two works highlight how interactions between European and non-European actors produced a hybrid culture within medical institutions. Nevertheless, the study of interconnection regarding the dissemination of medical knowledge and technology remains underexplored.

At the same time, the study of medical knowledge and technology within post-colonial countries warrants particular attention due to its significant implications. Arnold (2005) asserts that the interconnection of technological history in colonial and post-colonial contexts outside Europe demonstrates that technological development cannot be comprehended as a mere extension of the West (p. 98). This research emphasizes the need to acknowledge long-standing exchange, adaptation, and innovation involving non-European societies. Furthermore, it highlights the role of these interactions in shaping the global technological landscape (Arnold, 2005, pp. 98–99).

This article addresses the academic gap by examining the dynamics of European ophthalmological knowledge and technology in Yogyakarta. Ophthalmology stood as a vital branch of colonial medicine, primarily because eye diseases had been a major

concern in this region since the late 19th century (Sari & Nurdiana, 2024, p. 437). Statistics from 1890 indicate that eye diseases ranked as the fifth most prevalent disease among the population (Koningh, 1891, p. 204). Despite this high prevalence, the history of eye care in this region has received limited scholarly attention. Previous research remains focused on the general development of ophthalmology hospitals (Zondervan, 2016), the evolution of ophthalmology as a formal science (Sari & Nurdiana, 2024), the treatment of trachoma (Albar, 2025; ten Doesschate, 2017), and biographies of key medical figures (Hesselink, 2011; ten Doesschate, 2017).

By focusing on a case study of the *Prinses Juliana Gasthuis voor Ooglijders* (the Princess Juliana Hospital for Eye Disease Patients), this study explores the circulation and localization of European ophthalmological knowledge within hospital settings. The investigation specifically seeks to determine the role this institution played in the treatment of eye diseases. Furthermore, it analyzes how the hospital participated in the active circulation and localization of European ophthalmological knowledge and technology.

Methods.

This research employs historical analysis and medical material culture analysis within Arnold's (2005) framework, which highlights intercultural exchange, regional circulation, and the hybridization of European technology within a colony. The historical analysis was conducted through archival research to examine the development of the *Prinses Juliana Gasthuis voor Ooglijder* and eye care practices during the colonial period. Primary sources consisted of colonial and hospital reports. These documents provided empirical data on institutional dynamics, medical practices, and the distribution of health services, while also documenting the circulation of knowledge. Concurrently, the study examined the medical material culture of the hospital currently preserved in the Museum of Yap Prawirohusodo. By analyzing the brands and origins of these devices, the research evaluated them as evidence of the circulation of European technology and its dynamics in Yogyakarta. Furthermore, Arnold's (2005) framework served to demonstrate how ophthalmological knowledge and technology did not merely transfer linearly. Instead, these elements underwent constant exchange, negotiation, and adaptation through interactions between European and local actors.

Results and Discussion.

The Role of *Prinses Juliana Gasthuis voor Ooglijders* in Treating Eye Diseases.

The early 20th century represented a significant period of transformation for ophthalmology in Yogyakarta, characterized by the emergence of specialized medical personnel, dedicated hospitals, and advanced medical instruments. Initially, the dissemination of ophthalmological care in this region and Java in general began with

the appearance of *Doekoen Mata*, indigenous eye specialists trained by European physicians during the 1900s (Wilkens, 1913, p. xl). Subsequently, eye care entered a more formal phase of development in the 1920s with the establishment of clinics and hospitals that eventually evolved into permanent medical institutions.

The creation of these medical facilities was inextricably linked to the efforts of Dr. Yap Hong Tjoen. Born in Yogyakarta on March 30, 1885, this Chinese-Indonesian ophthalmologist pursued his higher education at the University of Leiden in the Netherlands, where he earned his doctorate in ophthalmology on January 24, 1919. While studying abroad, Dr. Yap developed a strong ambition to open a hospital dedicated to assisting impoverished individuals suffering from eye diseases. He clearly recognized the urgent lack of specialized medical services available to the general population of the Dutch East Indies (Sundari et al., 2023, p. 30; Wibowo, 2000, p. 19).

Fortunately, Dr. Yap received substantial backing from G. Vissering, the president of the Dutch bank, who formed a fundraising committee in 1919 alongside several other prominent figures to finance the hospital's construction. Additional support came from E.A. Zeilinga, president of the Java Bank, who founded the Central Association for the Promotion of Ophthalmology in the Dutch East Indies (*Centrale Vereeniging tot Bevordering der Oogheelkunde in Nederlandsch-Indie*). Furthermore, the late Mayor Oei Tiong Ham, a renowned philanthropist from Semarang, contributed significant funds to the cause. The Yogyakarta Department of the Agricultural Association of Vorstenlandsche (*Vorstenlandsche Landbouwvereeniging*) also played a vital role by covering annual operational costs. Simultaneously, the Sultanate of Yogyakarta provided the necessary land at no cost, while the colonial government offered subsidies and technical assistance through the Public Health Services (PHS) and the Domestic Administration (*Binnenlandsch Bestuur*) (Tjoen, 1926, p. 144).

While preparations for the hospital's construction were underway, Dr. Yap Hong Tjoen opened the *Polikliniek voor Ooglijders* (the Outpatient Clinic for Eye Patients) on June 20, 1921. Situated within a rented house in Gondolajoe, the clinic quickly became crowded with patients seeking specialized care. Subsequently, Sultan Hamengku Buwono VIII held a formal groundbreaking ceremony on November 21, 1922 (Tjoen, 1926, p. 144). The facility was designed by the renowned Dutch architect Eduard Cuypers, who worked under the company *NV Architecten en Ingenieursbureau Fermont te Weltevreden en Ed. Cuypers in Amsterdam*; Suhartono *et al*., 2020, p. 5). The hospital eventually opened on May 29, 1923, with an initial capacity to accommodate sixteen patients. Governor-General D. Fock conducted the inauguration and officially named the institution the *Prinses Juliana Gasthuis voor Ooglijders* (Tjoen, 1926, p. 144) (see Figures 1 and 2).

Figure 1. The Inauguration of *Prinses Juliana Gasthuis voor Ooglijders* in 1923, attended by Hamengku Buwono VIII and L.F. Dingemans, resident of Yogyakarta (left), and the hospital building (right) (Source: Bruggen & Wassing, 1998, pp. 42, 148).

Figure 2. The hospital ward (left) and patients from the hospital (right) (Source: Tjoen, 1926, p. 144).

The hospital building underwent continuous expansion to keep pace with growing patient demands. By May 1925, the facility provided 96 beds for those receiving free care, 12 beds for third-class patients, and approximately six beds for first- and second-class patients. Because the entire facility was fully operational by the end of that year, the average daily patient count reached 43 (Tjoen, 1926, p. 144). Hospital reports indicate that the number of clinical consultations increased steadily from 1921 to 1925 (see Table 1). During this timeframe, a total of 18,022 patients were treated, accounting for an impressive 217,905 consultations. These figures strongly suggest a high frequency of repeated visits and long-term care. Notably, the vast majority of those treated were indigenous individuals, totaling 16,514 people or 92% of the patient base. This was followed by 1,085 Chinese patients (6%) and 432 European patients (2%). Such statistics underscore the pivotal function of the hospital in providing specialized eye care, particularly to the indigenous community.

Table 1. Number of patients treated in *Polikliniek voor Ooglijders* and *Prinses Juliana Gasthuis voor Ooglijders* 1921–1925 (Tjoen, 1926, p. 144).

Year	Number of Patients	Number of Consultations
1921	2,132	21,149
1922	3,887	53,835
1923	3,863	45,318
1924	3,574	46,432
1925	4,566	51,171
Total	18,022	217,905

During the Japanese occupation, the *Prinses Juliana Gasthuis voor Ooglijders* was renamed *Rumah Sakit Mata dr. Yap* (Dr. Yap Eye Hospital), which remains its official designation today. Concurrently, the arrest and detention of Dr. Yap Hong Tjoen significantly disrupted hospital operations. Even upon his eventual return to the facility, formidable challenges persisted due to a drastic reduction in staff numbers and acute shortages of essential supplies, including medications, medical tools, and clothing. Furthermore, the patient count decreased during this turbulent era, forcing the hospital to function strictly within its limited remaining capacity. In 1949, Dr. Yap Hong Tjoen departed for the Netherlands, officially passing the leadership of the institution to his son, Dr. Yap Kie Tiong, who served until 1969 (Wibowo, 2000, p. 60). The hospital directors through the years are listed below.

- Dr. Yap Hong Tjoen (1923–1949)
- Dr. Yap Kie Tiong (1949–1969)
- Prof. R. Pramono (1969–1970)
- Dr. Gunawan (1970–1971)
- Dr. Basarodin Kusniomalebari (1971–1993)
- Dr. Tri Sutartin Radjiman (1973–2003)
- dr. Nunuk Mara Ulfah, Sp.M., M.Kes. (2004–2014)
- dr. Emy Tjahjani Permatasari, Sp.M., M.Kes. (2014–2020
- dr. Alida Lienawati, M.Kes (MMR)., FISQua (2020–present).

Circulating and Localizing Ophthalmological Knowledge and Technologies in Hospital Practice.

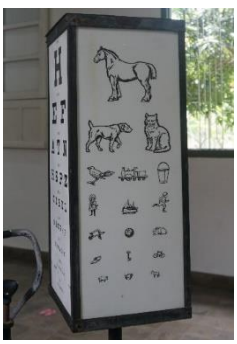
The circulation and localization of ophthalmological knowledge and technology in hospital practice can be understood through two interrelated contexts. Firstly, regarding knowledge, Dr. Yap's formal education in Europe, where he trained under esteemed European physicians, positioned him within a global network of medical expertise. Upon his return to the Dutch East Indies, he utilized this specialized training to facilitate the delivery of advanced eye care. Throughout his professional endeavors, he demonstrated the transfer of this expertise through clinical practice and institutional leadership. Accordingly, he applied standardized approaches to diagnosis and treatment

for his patients, effectively demonstrating the circulation of European ophthalmological knowledge far beyond its original geographical and social boundaries.

Nevertheless, the knowledge acquired by Dr. Yap was not applied without modification within local social settings. He frequently encountered patients who continued to rely on traditional indigenous understandings of illness and healing. Under these circumstances, he played a pivotal role in translating unfamiliar European medical concepts into forms that indigenous patients could comprehend. Thus, Dr. Yap became a recipient and an intermediary of European ophthalmological knowledge and technology. Therefore, global science was practiced effectively at a local level.

Secondly, the physical presence of technology is clearly observable in the hospital's medical devices. Various instruments used since the founding of the *Prinses Juliana Gasthuis voor Ooglijders* are currently preserved in the Museum of Dr. Yap Prawirohusodo. This museum was established in 1997 through the initiative of Dr. Tri Sutartin R., Sp.M., who served as the Director of Dr. Yap Eye Hospital from 1993 to 2003, alongside Dr. Basarodin, Sp.M., Dr. Wasisdi Gunawan, Sp.M., Ignatius Rudhyanto, J. Handoyo, and Mrs. Maghdalena. Their goal was to commemorate the legacy of Dr. Yap Hong Tjoen (Handayaningsih et al., 2020, pp. 100–101). The museum was officially inaugurated on May 29, 1988, by the Governor of Yogyakarta, Sri Sultan Hamengku Buwono X. It was initially named *Museum Rumah Sakit Mata Dr. Yap* (Dr. Yap Museum of Eye Hospital) and was located within one of the original hospital buildings. Subsequently, in 2013, management of the facility was transferred to the Dr. Yap Prawirohusodo Foundation, and the name was changed to the Museum of Dr. Yap Prawirohusodo. The collection is organized into three distinct categories, namely medical devices, household items, and private collections. This analysis focuses specifically on the medical devices as tangible evidence of the development and professionalization of ophthalmology in Yogyakarta.

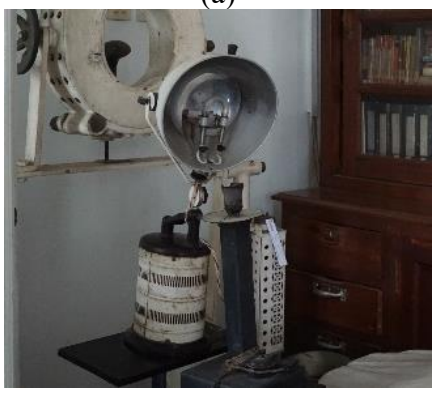
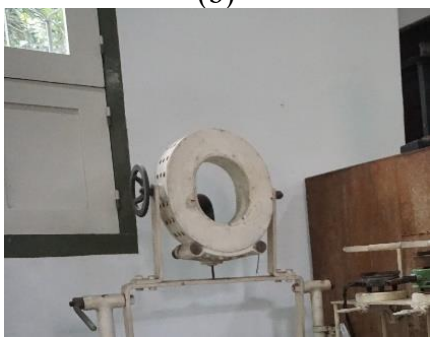
Table 2. Ophthalmological medical devices formerly used at the *Prinses Juliana Gasthuis voor Ooglijders*, currently in the collection of the Museum of Dr. Yap Prawirohusodo (Photographs by authors, 2025).

No.	Medical Devices	Photo
1	Snellen Chart It is a device utilized to measure visual acuity. This instrument determined whether a patient suffered from refractive errors, such as nearsightedness, farsightedness, or astigmatism. This specific chart is a product of John Weiss & Son (United Kingdom). Modified Snellen chart. Developed by Dr. Yap Hong Tjoen, this version employed animal images to replace the standard Latin letters found on conventional charts.	 (a)  (b)

No.	Medical Devices	Photo
2	Corrective and Trial Lens Set Used to determine the necessity for eyeglasses, this comprehensive set consists of various lens types and sizes ranging from 3 cm in diameter to larger dimensions. The lenses are categorized by shape into square and round varieties. These sets include convex and concave lenses, as well as a range of magnifying glasses, examination spectacles, and specialized eyewear for post-operative recovery.	
3	Ophthalmoscope This instrument is utilized to examine the anterior segment of the eye. The museum maintains several ophthalmoscopes from various prestigious brands, including Carl Zeiss Jena (Germany), Keeler (United Kingdom), Keeler Vizta Diagnostic (United Kingdom), Heine Beta 200 (Germany), and W. Walg Machf Heidenberg. The collection also features models produced in the 1960s by Neitz Instrument BX and Neitz B (Japan).	
4	Stereo Campimeter This device is employed in ophthalmological examinations to measure a patient's central field of vision. It is particularly effective for detecting scotomas (blind spots) or damage to the optic nerve. Accordingly, the collection of stereo campimeters at the museum is highly diverse, featuring examples constructed from leather, wood, plastic, and iron.	 
5	Perimeter It is a specialized device utilized to examine the visual field, assess overall visual function, and detect serious conditions like glaucoma. The museum's collection features two distinct types, namely wooden and metal. The wooden perimeter represents an earlier version of the instrument, although its exact place of manufacture remains unidentified. It operates by positioning paper markers at fixed	 (a)

No.	Medical Devices	Photo
	points that are rotated to create a full 360° field of vision for the patient. The Goldmann perimeter was developed by Hans Goldmann in Bern, Switzerland, in 1945. This device uses controlled light stimuli projected at specific locations to measure the visual field with high precision.	 (b)
6	Slit Lamp It is a specialized binocular microscope used to examine ocular structures, including the cornea, iris, vitreous, and retina. It supports a wide range of diagnostic examinations, laser treatments, and ocular imaging. The specific collection item was manufactured by Haag Streit Liebefeld Bern in Switzerland. This model features a fixation lamp that was introduced in 1945 and produced until 1959, when it was eventually replaced by the Model 900. Based on these characteristics, the instrument is estimated to date from the period between 1945 and 1958, most likely originating in the 1950s.	
7	Sollux It is a therapeutic device utilized to manage bleeding in the eye without the need for invasive surgery. The museum's collection includes several prestigious brands, including Eleitz Wetzlar, Leitz Focomat I C, and Hanau. Accordingly, these instruments were manufactured in Germany during the 1950s.	

No.	Medical Devices	Photo
8	Sterilization Equipment It clearly demonstrates how antiseptic principles were applied in early 20th-century medical procedures. The current set includes a hand-washing station equipped with a sterilization table, two heating burners, a container opening, a foot pedal, and a sterilization basin. Furthermore, it contains a Maison Luer autoclave, which features a pressure regulator on top and a drain pipe on the side. This autoclave was primarily used to sterilize surgical gowns and delicate instruments.	
9	Microscope The museum preserves several microscopes used by Dr. Yap throughout his clinical career. These include models from Eleitz Wetzlar, Carl Zeiss, and Isamy Batavia-C, which utilized Carl Zeiss Jena lenses. Additionally, the collection features a Reichert Wien unit from Austria.	
10	Incubator It is a device specifically designed for cultivating microbes at precise, adjustable temperatures. The museum's collection includes several units manufactured by Koninklijke Fabriek Interim (Netherlands) and Luer Wulfing-Luer (France).	
11	The equipment includes a wide array of devices utilized for ophthalmological examinations and surgical procedures, encompassing various types and international brands. This category contains tonometers, lamp holders of diverse dimensions, C. Davis Keeler flashlights, and cysto-urethroscopes. Furthermore, the collection features polarimeters and thermocontex iontophoresis units along with an assortment of spare components. Most of this specialized equipment was imported from abroad.	 

No.	Medical Devices	Photo
12	Surgical Equipment Operating Table This table features metal legs and supports, while the top surface consists of a sponge layer wrapped in clean white cloth. Operating Light This instrument supported medical and surgical procedures by providing optimal illumination within the operating field. The lamp is an Original Hanau product (Germany), produced during the 1950s. Electromagnetic Corporeal The primary function of this device is to attract and remove ferromagnetic foreign objects, such as metal or iron shards, from within the body. It is particularly vital for reaching difficult areas like the deep intraocular space inside the eye. This specific tool was manufactured by John Weiss & Son (United Kingdom).	 (a)  (b)  (c)
13	Wheelchair This custom-built three-wheeled wheelchair was fabricated directly by hospital staff to meet specific patient needs. The uniqueness of the device lies in its unconventional wheel system, which features two large wheels on the sides and a smaller stabilizing wheel at the rear. Interestingly, the design is equipped with springs shaped like those found on the traditional carriages of the Yogyakarta Royal Palace. Such a feature reflects the successful incorporation of local technology into the design of a medical aid. Consequently, the size and ergonomics of the chair were carefully adapted to suit Indonesian anthropometric conditions.	

No.	Medical Devices	Photo
14	Equipment for Compounding Medicine Dr. Yap personally formulated and mixed medicines for his patients when treating various eye diseases. The various devices used in this pharmaceutical process are still preserved in the museum, including measuring cups of different sizes, porcelain bowls, medicine scales, and mortars and pestles. Additionally, the collection includes medicine molds and spatulas. These tools consist of imported items and locally produced materials, such as wooden spatulas and custom medicine molds.	

The collection of medical devices provides substantial evidence regarding the historical practice of ophthalmology in Yogyakarta. These instruments offer profound insight into the application of diagnostic and therapeutic eye care to address a variety of conditions, including trachoma, glaucoma, strabismus, and other prevalent diseases. Significantly, the use of these tools marked a clear transition toward clinical medicine predicated on scientific observation and experimentation.

As demonstrated throughout this study, identifying the brands and manufacturers of these devices indicates that the vast majority originated in Europe, particularly within Germany, the United Kingdom, the Netherlands, Austria, France, and Switzerland. This finding highlights the existence of a robust transnational network of medical material culture connecting Europe and the Dutch East Indies. In addition to European instruments, several devices from Japan and America were also identified. Nevertheless, these items were produced later, around the 1960s, and therefore did not constitute the primary focus of this specific investigation.

Beyond the linear transfer of medical knowledge and technology, the findings also reveal the intentional modification of medical devices. A prime example is the Snellen chart (see Table 2, No. 1), which utilizes animal symbols instead of the Latin alphabet. Within the social context of Yogyakarta during that era, access to formal education was largely restricted to the nobility, leading to pervasive illiteracy among the broader community. Consequently, the standard Snellen chart proved to be an ineffective diagnostic method for many patients. In order to facilitate more precise eye examinations, the substitution of Latin letters with easily recognizable animal symbols was implemented. Thus, this finding underscores the adaptation of European medical technology to address specific social challenges, particularly the low literacy rate within the community.

Another noteworthy discovery involves the unique wheelchair fabricated by hospital staff (see Table 2 No. 13). Historical reports suggest that the hospital initially imported wheelchairs from Europe, but these were eventually deemed unsuitable because their dimensions conformed strictly to European physical standards.

Accordingly, Dr. Yap initiated the fabrication of custom wheelchairs adapted specifically to the posture and needs of the indigenous community. This instance demonstrates a successful technical adaptation to address challenges caused by physiological differences between populations.

Furthermore, hospital treatment was inseparable from the role Dr. Yap played in independently dispensing eye medications. The discovery of various compounding devices supports this conclusion (see Table 2, No. 14). Such a practice reveals that, despite his extensive training in European pharmacology, Dr. Yap did not rely entirely on imported pharmaceuticals. Instead, he prepared medications using local ingredients and equipment. Consequently, this reflects a strategic attempt to reduce dependence on European supplies while ensuring a consistent stock of medication for patient care.

Conclusions.

The development of ophthalmological practices in Yogyakarta was shaped by continuous processes of knowledge and technological circulation and localization. *Prinses Juliana Gasthuis voor Ooglijders* not only played a crucial role in the treatment of various eye diseases during the colonial period but also served as key sites for the transmission and adaptation of medical knowledge and technology. These developments were facilitated by transnational networks that connected Europe with hospitals in the Dutch East Indies. Through his extensive education in Europe, Dr. Yap acquired scientific knowledge and clinical skills while gaining exposure to advanced medical technologies. This experience allowed him to engage with a global network of medical expertise, which he subsequently integrated into the local context of Yogyakarta.

Furthermore, the utilization of medical equipment imported from Europe underscores the presence of transnational networks that connected industrial production centers with colonial territories. However, when this knowledge and technology were applied within the hospital, they frequently underwent significant modifications and adaptations. These changes addressed various sociocultural, physiological, and resource-related challenges, as exemplified by the custom Snellen charts, specialized wheelchairs, and equipment for compounding medicine. Thus, this analysis highlights the necessity of studying medical material culture to fully comprehend the dynamics of medical technology.

By analyzing these developments in Yogyakarta, the study implies that knowledge and technology were circulated and localized rather than simply transferred from colonial centers to the periphery. These findings reinforce the notion that medical advancement in post-colonial regions involves active local adaptation and the participation of indigenous communities. Consequently, the process was far more complex than a passive, one-way transfer of ideas. The study highlights the cross-border dissemination of medical expertise within a global context. Contemporaneously, this research illuminates how medical knowledge and technology

continue to globalize in the post-colonial era. The findings regarding localization provide important lessons for current health practices, particularly in developing countries with limited resources. Ultimately, the success of medical technology depends not only on access to transnational networks but also on the ability of local communities to adapt, modify, and integrate these tools to meet their specific social and cultural needs.

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Conflicts of Interest.

The authors declare no conflict of interest.

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Лікування очей в Індонезії: Поширення та локалізація європейських офтальмологічних знань і технологій у Джок'якарті XX століття

Анотація. *У цьому дослідженні розглядається становлення офтальмологічної практики в Джок'якарті, зокрема в контексті медицини. Зосереджуючись на лікарні «Лікарня принцеси Юліани для пацієнтів із захворюваннями очей», робота аналізує процеси поширення та локалізації європейських офтальмологічних знань і технологій у колоніальному середовищі. Дослідження передбачало ґрунтовний аналіз архівних документів, зокрема колоніальних і лікарняних звітів, а також вивчення марок і походження медичного обладнання, що нині зберігається в Музеї доктора Япа Правірохусодо. Аналіз базується на концептуальному підході Девіда Арнольда (2005), який акцентує увагу на міжкультурному обміні, регіональній циркуляції та гібридизації європейських знань і технологій у колоніальному контексті. Лікарню принцеси Юліани для пацієнтів із захворюваннями очей було засновано у 1923 році доктором Япом Хонг Тьоеном — китайсько-індонезійським офтальмологом, який здобув докторський ступінь у Лейденському університеті. Саме завдяки європейській освіті він став частиною глобальної мережі медичних знань і відіграв ключову роль у поширенні офтальмологічних знань і технологій після повернення до Голландської Ост-Індії для роботи в лікарні. Хоча він застосовував стандартизовані європейські методи діагностики та лікування хвороб очей, водночас адаптував ці знання до місцевих умов, перекладаючи незрозумілі західні концепції для корінних пацієнтів. Крім того, аналіз медичного обладнання свідчить про значний приплив імпортованих із Європи приладів до Джок'якарти, що підкреслює існування розгалуженої транснаціональної мережі. Водночас дослідження виявляє приклади модифікації та самостійного виготовлення обладнання, зокрема таблиць Снеллена, інвалідних візків і пристроїв для приготування лікарських засобів. Такі адаптації дають змогу зрозуміти, як технології пристосовувалися до місцевих*

потреб, сформованих соціальними, культурними та фізичними чинниками. Це дослідження робить внесок у історіографію медицини Голландської Ост-Індії, висвітлюючи роль місцевих агентів і матеріальний аспект медичних технологій. Воно також підкреслює значення локального середовища в глобальному поширенні та практичному застосуванні європейської медичної науки.

Ключові слова: *лікарня принцеси Юліани для пацієнтів із захворюваннями очей; колоніальна медицина; медичні знання; медичні технології; локальна адаптація; музей доктора Япа Правірохусодо*

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