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Health Administration Research

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Commentary

There are at least 5 lessons from PHC in the UK that policymakers and stakeholders at the national level could learn from.
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Literature Review

Leader's commitment in monitoring and evaluation is required to maintain patient safety culture.
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Original Research

Many hospitals were stuttering and unable to adapt to the new payment system. Some hospitals complained about INA-CBG rates that were lower than the real rates, so that hospitals suffered losses.
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JURNAL ADMINISTRASI KESEHATAN INDONESIA
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EDITORIAL

HOW HAS COVID-19 CHANGED THE WAY HOSPITALS DELIVER CARE?

Bagaimana Covid-19 Mengubah Cara Rumah Sakit Memberikan Perawatan?

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During the pandemic, healthcare facilities in Indonesia faced very vulnerable conditions. So far, dealing with the pandemic has had a significant impact on the national referral system for health services. Hospitals are the last line of defence for the increase in COVID-19 referral cases, leading to high percentage of BOR (Bed Occupancy Rate). We have selected several articles related to health services, especially hospitals, to provide perspectives and contributions to different referral health services.

COVID-19 pandemic is recognized as the opening up of weaknesses in the health care system in Indonesia. Therefore, reforms and innovations are needed at all levels, as well as learning from other countries. In this issue, we invite readers to explore five primary and secondary health care lessons in the United Kingdom. Things to consider in this health service include easy access, digital and online services, ongoing care, chronic condition management, and referral systems (Kusuma, 2021). Aside from the differences in economic level and ideology of health services between UK and Indonesia, some of the things on offer may open our perspective, especially with regard to referral health services.

As a result of health services in the United Kingdom, since Indonesia has a national health insurance program, this health financing system has transformed services in hospitals. The benefits of health insurance during the COVID-19 pandemic are an essential part of implementing referral health services for all Indonesians. Although hospitals are still experiencing actual rates and losses, the state guarantees financial security for the community in the context of a pandemic. Several hospitals have developed cost-effectiveness strategies through digitization, human resource capabilities, customer relationships, and stakeholder collaboration (Nugraheni *et al.*, 2021). Effectiveness in reducing hospital operating costs can be pursued by digitizing and optimizing the application of information management systems. One of the models used is the HOT-fit (Human Organizational Technology) model (Febrita *et al.*, 2021).

In addition to the management information system, during a pandemic, hospital management must reorganize the nursing system of nurses and measure job satisfaction. Nurses are health professionals who run the most significant risk and treat patients longer than other health professionals. Career promotion and reward systems and job dedication awards can help them provide services to patients (Saputri *et al.*, 2021). The link between

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career and job satisfaction may also apply to other health professions.

During the pandemic, the problems of patient safety also continue to grow. Medical laboratories play an important role in making medical diagnoses. Although the error rate in medical laboratories is shallow, with one error in 330-1,000 cases, it is still a concern. Healthcare Failure Mode and Impact Assessment (HFMEA) is a proactive prevention method to identify and evaluate potential failures. Reviewed in a literature review, this study identified patient safety factors in hospital laboratories and to demonstrate the process of identifying potential risks using HFMEA. The literature review explained that the highest error rate in the laboratory occurs in the per-analytical phase of 49.2-84.5% (Salsabila *et al.*, 2021).

The collapse of hospital conditions in Indonesia is also related to how health authorities recommend using masks for the community and health workers in hospitals. The different types of shows used by the community have implications for the availability of standard PBT (personal protective equipment) for health workers. Our authors describe variations and discrepancies in policies in countries (Liyanage *et al.*, 2021).

Meanwhile, on-the-job hospitals can implement therapeutic communication for tuberculosis patients in the treatment of COVID-19 patients. Patients after COVID-19 are vulnerable to stigma and social support in terms of the same droplet transmission method. Stigma in the recovery period due to COVID-19 is often a barrier for patients (Merzistya *et al.*, 2021). Apart from the many problems in hospital services in the pandemic era, the high workload on health workers is the cause of mental health problems for health workers. It causes various behaviours of abuse of antidepressants and other mild types of drugs (Ridlo, 2020; Saloko and Manzilati, 2021).

Finally, in a pandemic situation, the role of hospital managers is not only to ensure optimal service to COVID-19 patients but also to ensure that the service system can function efficiently and effectively.

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COMMENTARY ARTICLE

LESSONS FROM PRIMARY HEALTH CARE IN THE UNITED KINGDOM

Pelajaran dari Pelayanan Kesehatan Primer di Inggris

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ABSTRACT

The health system in Indonesia is facing the persistent burden of maternal mortality and infectious diseases (including COVID-19) and an increasing burden of non-communicable diseases. Thus, health system reform and innovations at all levels are needed, including through lessons learned from other countries. There are at least five lessons from primary health care in the United Kingdom: easy access, digital and online services, continuity of care, managing chronic conditions, and referral and counter-referral system. There are lessons that policymakers and stakeholders at the national and local (city/district) level could potentially learn from. Despite the differences between the UK and Indonesia (e.g. country income level, national health systems), these lessons could be adapted or piloted in some settings.

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INTRODUCTION

Like in many low-and-middle-income countries (LMICs), the health system in Indonesia is facing the persistent burden of maternal mortality and infectious diseases (including COVID-19) as well as an increasing burden of non-communicable diseases (NCDs) (Kusuma et al. 2019). Thus, health system reform and innovations at all levels (community, primary care, and secondary/tertiary care) are needed, including through lessons learned from other countries. This commentary aims to provide lessons learned from primary health care (PHC) in the United Kingdom (UK). However, I will first present a brief introduction to PHC and the UK health systems.

DISCUSSION

The concept of PHC started at the International Conference on Primary Health Care, which resulted in the Declaration of Alma Ata (USSR) in September 1978 (WHO, 1978). There are at least two things to be highlighted. **First**, Article 1 provided a definition of health, which is a state of complete physical, mental and social wellbeing, and not merely the absence of disease or infirmity. This understanding that health is not just physical health, but also mental health and social wellbeing is an essential basis for PHC. **Second**, Article VII stated that PHC addresses main health problems in the community through promotive, preventive, curative and rehabilitative services. These are some examples of PHC services, many of which can now be found at government and private clinics in Indonesia.

In 2008, 30 years after Alma Ata, experts provided reviews and revisions to the concept so that PHC can better respond to current global health challenges, especially in LMICs. These

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reviews, published in The Lancet journal, included interventions to address maternal, newborn, and child survival for integrated PHC strategies (Bhutta *et al.*, 2008), and how PHC can help improve the prevention and management of chronic disease in LMICs (Beaglehole *et al.*, 2008). In October 2018, WHO and UNICEF held the second global conference on PHC, which resulted in the Declaration of Astana (Kazakhstan). This was to reaffirm the global commitments towards universal health coverage and the Sustainable Development Goals through PHC (WHO, 2018). WHO and UNICEF shared a vision that "*PHC is a whole-of-society approach to health that aims at ensuring the highest possible level of health and well-being and their equitable distribution by focusing on people's needs and as early as possible along the continuum from health promotion and disease prevention to treatment, rehabilitation and palliative care, and as close as feasible to people's everyday environment*." (WHO, 2021).

In the UK, the health system is mainly funded through general taxation, with the remainder coming from private medical insurance and out-of-pocket payments. In the provision of services, while PHC and secondary/tertiary care are provided by the National Health Services (e.g., NHS England or NHS Scotland), public health services are provided by public health institutions (e.g., Public Health England or Health Protection Scotland). Primary care is mainly provided by practice-based general practitioners (GP), with practices increasingly including other health care professionals such as nurses. Most secondary care is provided by salaried specialist doctors and others who work in state-owned hospitals. Tertiary services offer more specialized care, and are often linked to medical schools or teaching hospitals (Cylus *et al.*, 2015).

There are at least five lessons from PHC in the UK. **First**, registering or accessing the GP is easy, that is through the NHS website (www.nhs.uk/service-search/find-a-GP). One only needs to enter a town, city or postcode in England and the website will provide a list of clinics to choose from. Filling in a postcode W4 2DR, for instance, will give a list of several GP clinics in London (see Figure 1). Similarly, for rural areas, filling in a postcode WV16 4BX will provide a list of clinics within or nearby Bridgnorth Town, nearly 230 kilometers from London or 44 kilometers from Birmingham.

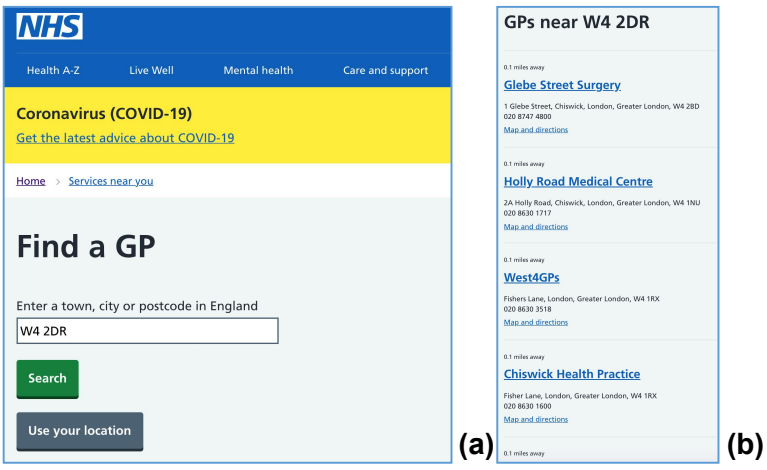

Figure 1. Easy access to GP

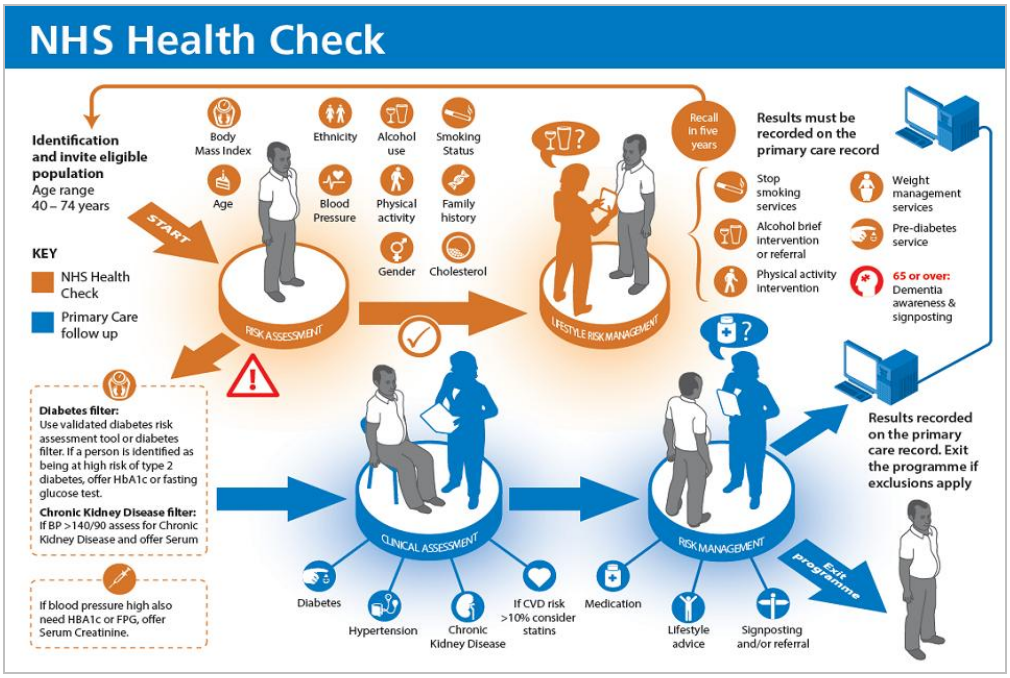

Figure 2. NHS Health Check (UKGOV, 2021)

Second, all clinics have digital and online information/services. By clicking one clinic website (e.g., Holly Road Medical Centre in Figure 1 panel b), one will find information on opening times, appointment, services, medical or health team, and contact. While services provided may vary between city and town clinics, all patients need to make an appointment before coming to clinics. This helps reduce patient queue and waiting time at a clinic.

Third, PHC is designed to provide continuity of care for patients. A study in public clinics in Malaysia showed that 85% of sampled patients reported having no own doctor when needing help with health problems (Lim *et al.*, 2021). In the UK, all residents can register with a GP and consult their GP practice without charge. Primary care increasingly means not only a GP but a whole team of doctors, nurses, midwives, health visitors and other health care professionals in a community setting. GP surgeries provide a range of services, including routine diagnostic services, minor surgery, family planning, ongoing care for patients with chronic conditions, antenatal care, preventive services, health promotion, outpatient pharmaceutical prescriptions, sickness certification and referrals for more specialized care. All this is to support continuity of care for patients (Cylus *et al.*, 2015).

Fourth, PHC provides services and support in managing chronic conditions. A study in Indonesia found that many cities and districts in Indonesia have a very high prevalence of obesity, hypertension, and diabetes among the adult populations (Adisasmito *et al.*, 2020). However, support to help manage these conditions is lacking at the PHC level (Kusuma et al. 2019). In the UK, services at NHS clinics include managing chronic diseases such as diabetes, chronic heart diseases, COPD, and hypertension. There are also support on healthy lifestyles such as smoking cessation, weight loss, and alcohol advice (for example, see: https://www.hollyroadmedicalcentre.nhs.uk/services/). Moreover, the clinics provide NHS Health Check, a national program to assess the risk of developing heart

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disease, stroke, diabetes, kidney disease among everybody age 40+ years (see Figure 2) (UKGOV, 2021).

Fifth, a working referral and counter-referral system between PHC and hospitals. A study in Malaysia found that over 80% of doctors at public clinics reported seldom/never or occasionally received counter referrals of their patients from specialists at hospitals (Lim *et al.*, 2021). In the UK, if one wishes to be referred to a specialist at hospitals, s/he should see her/his GP because all medical records are held by that clinic. After a referral, the GP will receive back the information from hospitals (either electronically or by paper or both). All this to ensure an active referral and counter-referral system between all levels of care.

All these lessons are valuable to help improve health systems in Indonesia, especially within the context of achieving *Jaminan Kesehatan Nasional* (JKN), or universal health coverage. The challenges for JKN increase with the rapid growth of the population covered. Among others, service preparedness is among the main challenges. Inadequate medical facilities remain an issue, especially for public hospitals and puskesmas. In 2017, 82% of public hospitals received a passing grade for preparedness; however, only 67% of puskesmas passed. Antenatal care coverage, as one of the service parameters, ranged from 40% in remote provinces such as Maluku and Papua to 85% or more in urban areas such as Bali and DI Yogyakarta (Agustina *et al.*, 2019). Efforts are needed to strengthen the role of PHC in response to these challenges.

While national adoption of all the lessons from the UK may not be feasible at once, adoptions of select lessons through pilots may be more suitable. City governments may improve registration and access to Puskesmas or private clinics through a website, including helpful information on available services in each clinic. Also, the Ministry of Health may collaborate with some local governments to design and pilot an enhanced PHC at puskesmas or private clinics to better tackle NCDs (e.g. stroke, diabetes) and their risk factors. In Malaysia, the government piloted such reform to improve the performance of the health system in managing NCDs, an integrated care model was designed to enhance existing healthcare services by incorporating public health, primary healthcare and social support as part of a 'network' linked to appropriate secondary and tertiary hospital services (Sivasampu *et al.*, 2020). Also, the Ministry of Health and BPJS (the national health insurance agency) may collaborate with puskesmas and private clinics in creating/recreating an effective national program to improve NCD prevention and control, similar to the NHS Health Check.

CONCLUSION

There are at least five lessons from PHC in the UK that policymakers and stakeholders at the national and local (city/district) level could potentially learn from. Despite the differences between the UK and Indonesia (e.g. country income level, national health systems), these lessons could be adopted or piloted in some settings in Indonesia.

DECLARATIONS

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ORIGINAL RESEARCH

BEST PRACTICE OF HOSPITAL MANAGEMENT STRATEGY TO THRIVE IN THE NATIONAL HEALTH INSURANCE ERA

Praktik Terbaik Strategi Manajemen Rumah Sakit untuk Berkembang di Era Jaminan Kesehatan Nasional

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ABSTRACT

Background: The implementation of the National Health Insurance (JKN) program has created a transformation in the health care system in Indonesia. Many hospitals were overwhelmed and unable to adapt to the new payment system. Some hospitals experienced cost losses due to INA-CBG rates which were lower than the actual rates.
Aims: This study identified the best practice of hospital management strategy to thrive in the JKN era in Indonesia.
Methods: This study used a qualitative design. The data collection was recorded through in-depth interviews with the Director of Dr. Iskak Tulungagung District General Hospital and the Director of An-Nisa Tangerang Hospital as best practice of hospital management in the implementation of JKN from public and private hospital, respectively. The interviews were obtained by using audio recorded and it were transcribed as a verbatim. Supporting data were obtained by reviewing the hospital documents. The data was analyzed by conducting content analysis.
Results: The best practice management strategy of the two hospitals to thrive in the JKN era is increasing efficiency in operational cost through digitalization, increasing the capability of human resources, customer relationship management, developing collaborations and support from stakeholders.
Conclusion: Both hospitals could survive from delay claims payment and bankruptcy by implementing strategy and innovation to adapt in the JKN era. The results of this study can be used by government-owned and private hospitals as references to improve the management strategy of hospital in Indonesia.

Keywords: best practice, hospital, National Health Insurance, strategy

ABSTRAK

Latar Belakang: *Implementasi program Jaminan Kesehatan Nasional (JKN) telah menciptakan transformasi sistem pelayanan kesehatan di Indonesia. Tidak sedikit rumah sakit yang gagap dan tidak mampu beradaptasi dengan sistem pembayaran yang baru. Beberapa rumah sakit juga mengeluhkan tarif INA-CBG yang lebih rendah dari tarif riil rumah sakit yang menyebabkan rumah sakit mengalami kerugian.*
Tujuan: *Penelitian ini mengidentifikasi praktik terbaik strategi manajemen rumah sakit untuk dapat berkembang di era JKN Data pendukung didapatkan dengan menelaah dokumen rumah sakit. Data diolah secara analisis konten.*
Hasil: *Strategi yang dilakukan oleh kedua rumah sakit untuk berkembang di era JKN adalah efisiensi biaya operasional melalui digitalisasi, peningkatan kapabilitas sumber daya manusia, manajemen hubungan pelanggan,dan kolaborasi dan dukungan pemangku kepentingan.*
Kesimpulan: *Kedua rumah sakit tersebut dapat bertahan dari pembayaran klaim yang tertunda dan kebangkrutan dengan menerapkan strategi dan inovasi untuk beradaptasi di era JKN. Hasil penelitian ini dapat digunakan oleh rumah sakit pemerintah dan swasta di Indonesia sebagai pedoman untuk dapat berkembang di era JKN.*

Kata kunci*: Jaminan Kesehatan Nasional, rumah sakit, strategi, praktik terbaik.*

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INTRODUCTION

Indonesia began the initial steps of implementing the National Health Insurance (JKN) in 2014 as mandated by Law No. 40 of 2004 concerning the National Social Security System and Law No. 24 of 2011 about the Social Security Agency (BPJS). JKN program gave high expectations for all Indonesian to access affordable and qualified health care services. This expectation has been proven since the first year of JKN by the increasing of inpatient services until 110.5% (Nugraheni, 2017). Moreover, the JKN program could reduce the impact of poverty due to high health care costs (Hartono, 2017). Research conducted by Dartanto *et al.* (2017) showed that there were 1.16 million people saved from poverty and 14.5 million people saved from severe poverty in 2016. The JKN program could protect 320.000 poor people from debt of up to Rp.7.3 million to pay decent health services.

The JKN program not merely opened the access to health services for all Indonesian, but also directly created a transformation of the health service system in Indonesia (Nugraheni and Hartono, 2017). The JKN program forced health services to increase their quality services to the patients. The credentialing process carried out by the Social Security Agency for Health (BPJS-Health) required hospitals to improve the quality of services through hospital accreditation. In 2014, there were only 535 accredited hospitals, equivalent to 22% of the total hospitals in Indonesia. Within five years of the JKN program implementation, the number of accredited hospitals increased sharply become 2,926 hospitals or equivalent to 76% of the total hospitals in Indonesia (BPJS Kesehatan, 2019).

In addition to prioritizing the quality of health services for the community, the JKN program was also required to implement cost control of health services. One of the forms of cost control was by implementing a Diagnosis-Related Group (DRG) payment commonly referred to INA-CBGs for hospitals. INA CBGs are package payment systems based on the common diagnoses of diseases and the resources used. The implementation of the INA-CBGs payment system was expected to be more efficient compared to the fee for service payment system (Hidayat, 2016; Happy, 2018).

Hospitals as health care providers for 224.1 million participants of JKN program had to adapt with the changes that occur (BPJS Kesehatan, 2019). This change occurs where the hospital must treat patients properly with efficient resources (Prayitno and Suharmiati, 2018). Besides, hospitals were required to innovate to excel competition in the JKN era. Many hospitals were not been able for the health care system reform in the JKN era. Some hospitals complained that INA-CBGs rates were lower than the real hospital rates, and thus deficit continued to occur due to higher costs (Edya, 2017; Muslimah, Tri Murti Andayani, Rizaldy Pinzon, 2018). Some of Indonesian Ministry of Health's vertical hospitals also experienced deficits due to high costs, limited resources and poor management (Wijayani, 2018). The deficits experienced by BPJS-Health also impacted on delayed claims and hospital cash flow.

Although the health care system changes after the implementation of JKN, some hospitals could overcome these challenges, even grow and innovate. Based on the observations, there are 2 hospitals that have succeeded in increasing the profitability and hospital growth in JKN era (JPNN, 2019; Times Indonesia, 2019). They are Dr. Iskak Tulungagung District General Hospital as the government hospital who received the

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IHF 2019 Gold Award at the 43rd International Hospital Federation (IHF) Congress and Award at the Oman Convention and Exhibition Center Muscat, United Arab Emirates, 8 November 2019 due to the implementation of public safety to the JKN and Non-JKN patients (JPNN, 2019; Times Indonesia, 2019) and An-Nisa Tangerang Hospital as the private hospital who received up to 1,000 patient visits every day and get an average profit of 25% every year (BPJS Kesehatan, 2017). An-Nisa hospital received 40,094 outpatients in 2014 and increased to 136,694 and 211,247 in 2016 and 2018, respectively (RS Annisa, 2019).

Although both hospitals have been known for their best management practice, their key of successful management strategies to increase the hospital growth have not been documented yet. This study identified the best practice of the hospital management strategies to thrive in the JKN era in Indonesia. The similarities of strategies implemented by both hospitals were described in this study.

METHOD

This study used a qualitative design with a case study approach. Qualitative design was chosen to obtain in depth reason key success of the hospital growth. Inclusion criteria of the study was the top management of Dr. Iskak Tulungagung District General Hospital and An-Nisa Tangerang Hospital. The data were collected through in-depth interviews with the Director of Dr. Iskak Tulungagung District General Hospital and the Director of An-Nisa Tangerang Hospital with semi-structured interviews. The interview was conducted by AHZ and RKH. The interviews were conducted after obtaining participants consent to participate in this study. We recorded the audio of the in-depth interview. Each of interview was conducted for one hour. The audio was transcribed into a verbatim by AHZ. Supporting data were obtained through a review of hospital documents, such as hospital's work and budget plan, strategic plan, management and finance reports. The study was conducted for three weeks between 2 and 20 December 2019.

In order to answer the purpose of this study, the analysis was done by using content analysis by WPN, AHZ, and RKH. We analyze all information obtained from the results of the study through excerpt of interview results, sentences, and table summary of hospital strategy with consider the validation. The validation was carried out by conducting the data triangulation. The data was derived from in-depth interview complemented by secondary data collection from both hospital which have the best practices of hospital management strategies. The description of the review included profile, organization and management, financial condition, strategy, and innovation of the hospitals in surviving the transformation of health services in the JKN era (Genesys, 2008; Blocker *et al.*, 2011; Chiang and Wang, 2015; Kabene *et al.*, 2006; Nigam *et al.*, 2014). The protocol for the study was reviewed and approved by the National Institute of Health Research and Development, Ministry of Health Republic of Indonesia with the reference number: LB.02.01/2/KE.212/2019.

RESULTS AND DISCUSSION

Dr. Iskak Tulungagung District General Hospital

Hospital Profile

Dr. Iskak Tulungagung District General Hospital was classified as Class-B Teaching Hospital established on May 25, 2016 based on the Decree of the Indonesian Minister of Health Number:

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HK.02.03/I/1147/2016. Since May 18 2015, Dr. Iskak Tulungagung District General Hospital was appointed as a District Referral Hospital based on the East Java Governor Decree Number: 188/359/KPTS/013/2015 which assigned referrals from the Trenggalek Regency, Blitar City, Blitar Regency and Pacitan Regency. In 2018, Dr. Iskak Tulungagung District General Hospital was fully labelled as a District Public Service Agency based on the Decree of the Tulungagung Regent Number: 188.45/554/031/2008.

Dr. Iskak Tulungagung District General Hospital has 13 specialist services and 7 subspecialist services with 476 beds. In 2018, the average monthly outpatient visits, monthly inpatient visits, and emergency room visits were 15,864, 2,713 and 3,703 respectively. The vision of Dr. Iskak Tulungagung District General Hospital is to create a referral and teaching hospital that is reliable and affordable in services. While the mission of Dr. Iskak Tulungagung District General Hospital is to improve the quality and access to health services, conduct quality education and research in the fields of health and medicine, and implement accountable hospital management.

Hospital Organization and Management

The biggest challenge in the management of government-owned hospitals is the large amount of political, legal, media, and other external interventions that can disrupt organizational processes and management that have been established. Dr. Iskak Tulungagung District General Hospital could develop themselves quickly because they had no external intervention to the hospital management, such as undone practice from the executive, legislative, law enforcement officers, NGOs and journalists. Until now, the hospital can operate independently as the real Public Service Agency (BLU), and all employees can work professionally.

> *"Our hospital can thrive rapidly because it is free from external intervention, so the management can work professionally ..."* (Director of Dr. Iskak Tulungagung District General Hospital).

Dr. Iskak Tulungagung District General Hospital believed that human resources are the main asset of the hospital. The hospital management has held regular trainings and formed accredited internal training program. They also guarantee the welfare of employees with negotiation by calculating the amount of remuneration expected by each employee higher than that in other competing hospitals. This step has been carried out by the hospital management to maintain employee loyalty.

> *"We gather all doctors and staffs. We ask one by one how much salary is expected. We adjust the salary to their expectations so that each employee can work happily..."* (Director of Dr. Iskak Tulungagung District General Hospital).

Hospital Strategy

Dr. Iskak Tulungagung District General Hospital has a low-cost hospital, high quality and hospital social responsibility strategy. The low-cost strategy was implemented with the principle of efficiency and effectiveness in each hospital function, both service and management. The hospital has utilized technology to implement efficient and effective strategies in every business and management process, such as

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establishing a floating slip system and an electronic drug management system (Si Monic). A floating slip is a digitizing system that simplifies the process of correspondence that can be monitored accurately and speeds up the bureaucratic process. Whereas, Si Monic is a drug procurement system that is integrated with information systems to avoid drug stockout and avoid manipulation in drug procurement.

The high-quality strategy carried was fully committed to the quality of service as outlined in Public Service Regulation No. 16 of 2018. The hospital prioritizes services to patients by forming a complaint handling unit that is in charge of going around the hospital to resolve complaints and help patients who are confused when visiting the hospital. To avoid long patient queues, the hospital has created Si Poetri application for online patient registration without queuing at the hospital. With these innovations, Dr. Iskak Tulungagung District General Hospital received a Community Satisfaction Index of 83.05 in 2018.

Dr. Iskak Tulungagung District General Hospital has a motto “hospital without a wall” as a form of social responsibility to provide health services not only limited within the hospital area but also outside the hospital. They provide the services by developing the Public Safety Center (PSC) system. This system provides a fast response to all emergency events that endanger lives of the community, such as illness, traffic accidents, natural disasters, fires, riots etc. People can access these services through telephone and emergency button applications. This system automatically encourages good cross-sector collaboration among district health offices, public healthcare centres, private hospitals, regional disaster management agencies, regional polices, and fire departments to give a quick response to emergency events. The system implements a response time at 0 minutes or it is handled directly by the officer. For example, when a fire occurs, fire departments can immediately respond and handle fire problem, while public healthcare centers and private hospitals can immediately giving health services to the victims. The Public Safety Center (PSC) is supported by a complete and modern emergency department called INSTAGRAM is a strategy to increase hospital utilization. Data from service report mentioned that 80% of the inpatients reaching to 150 people per day came from the emergency room. PSC and INSTAGRAM system have made the hospital uninterrupted for the tiered referral regulations implemented by BPJS-Health.

> *"Dr. Iskak District General Hospital’s motto is a “hospital without a wall". Basically, we provide community services not limited in our hospital area but also outside the hospital through this PSC system. We collaborate with primary healthcare centers, private hospitals, polices if there is an accident, and Regional Disaster Management Agency if there is a disaster"* (Director of Dr. Iskak Tulungagung District General Hospital).

> *"We are not affected by the tiered referral policy of BPJS-Health. Thanks to the PSC system that we built. Our emergency room visit was very high, and this contributed greatly to inpatient visits"* (Director of Dr. Iskak Tulungagung District General Hospital).

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Hospital Finance

The deficit conditions experienced by BPJS-Health has caused delayed claim payment to the hospital for six months. However, delayed claim payment did not affect the hospital operations. Dr. Iskak Tulungagung District General Hospital circumvented this problem by diverting the hospital's construction funds to cover operational costs aduring the unpaid claims by BPJS-Health. The hospital's construction fund was originally planned for new buildings and beds. Dr. Iskak Tulungagung District General Hospital is one of the hospitals that no longer gets subsidies from the government. Even though hospitals are not subsidized, they have proven to operate optimally with a CRR (Cost Recovery Rate) of 104% in 2018.

> *"In 2019, we experienced a delay in payment of BPJS-Health claims for 6 months. We covered our operational cash flow using development funds that should be used for new building construction and bed additions"* (Director of Dr. Iskak Tulungagung District General Hospital).

> *"Our hospital is one of the hospitals that does not get funding from the regional government anymore because we could be independent. In 2018, our CRR was 104%"* (Director of Dr. Iskak Tulungagung District General Hospital).

Hospital Innovation

After the successful operation of the PSC and INSTAGRAM systems, Dr. Iskak Tulungagung District General Hospital established an Integrated Acute Coronary Syndroma Service System (LASKAR) that was integrated with the previous two systems. If there is a heart attack in the community, then the PSC Team at the nearest health facility will pick up the patient that will be treated at the nearest hospital or primary healthcare center that has an electrocardiogram (ECG) facility, However, if it is a very emergency case, Dr. Iskak Tulungagung District General Hospital will immediately handle it.

Other than that, the hospital has also developed maternal and child health services that are integrated with PSC. Maternal and child health services provide information services to the community and a quick response to emergencies occurred to pregnant women, infants and toddlers. With the development of this system, Tulungagung District succeeded in reducing the maternal mortality rate into 34.6 per 100,000 births which has far exceeded the target of the SDGs in 2030 by 70 per 100,000 births. In 2019, Dr. Iskak Tulungagung District General Hospital developed post-hospital care services that monitor the development of patient's health after being discharged from the hospital.

> *"In the future, we are developing post-hospital care services, so the health condition of discharged patients can still be monitored"* (Director of Dr. Iskak Tulungagung District General Hospital).

An-Nisa Tangerang Hospital

Hospital Profile

An-Nisa Tangerang Hospital started as a maternity hospital under the ownership of the Permata Bunda Foundation with a capacity of 20 beds in 1991. In 2008, the maternity hospital was developed into a general hospital with a

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capacity of 100 beds and 6 specialist services. At present, An-Nisa Tangerang Hospital is classified as Class-C General Hospital under the ownership of PT Annisa Utama with a capacity of 187 beds and 18 specialist services. In 2018, the average monthly outpatient, inpatient, and emergency department visits were 17,491, 1,579 and 2,103 respectively. An-Nisa Tangerang Hospital has a vision to be an Islamic hospital that is trusted and chosen by the community. While, its mission is to provide qualified and professional services, to brand the image of Islam at all levels in all actions and appearances, and to develop a spirit of services in every employee.

Hospital Organization and Management

An-Nisa Tangerang Hospital realized that human resources is the main asset in the hospital business, and thus the organizational environment is formed to create thriving employees. All nursing staffs have a minimum nursing education, and all the main management line has postgraduate education. An-Nisa Tangerang Hospital provided scholarships to employees who wish to continue their studies and conducted comparative studies visit to the best hospital in other countries every year. In terms of organizational aspect, An-Nisa Tangerang Hospital instilled a culture of serving and working hard in every staff in the organization. The organizational environment also promoted collaboration between hospital owners, management and doctors.

> *"The fourth thing that locks them to be royal to An-Nisa Hospital is that we give 30% of the hospital shares to the doctors. If this hospital is profitable, the profits will return to them..."* (Director of An-Nisa Tangerang Hospital).

Hospital Strategy

The target market of An-Nisa Tangerang Hospital was 90% of total patients are JKN participants. With this target market, the business strategy used was the low-cost strategy in every aspect of the hospital business such as the use of generic drugs, purchasing drugs through e-catalogs and technology and utilize technology and digitalization to achieve efficiency. Procurement of generic medicines as well as through e-catalogs system needs lower costs than procurement of patent brands. In addition, digitization helps to accelerate service flow, reduce paper printing, and minimize service errors, so that it save hospital operational costs

The marketing strategy chosen was a word of mouth recommendation from patients who have visited the hospital. To get an income margin that exceeds the average margin of the hospital industry in Indonesia, the hospital management optimized every existing asset and increased service utilization capacity. The current income of An-Nisa Tangerang Hospital reached 15 billion every month.

> *"So the biggest income is actually from BPJS-Health patients as much as 12 billion and from non-BPJS-Health patients as much as 3 billion. It is equivalent to 90% of BPJS patients and 10% of non-BPJS patients..."* (Director of An-Nisa Tangerang Hospital).

> *"The marketing target of An-Nisa Tangerang Hospital got a turnover of 15 billion, but our marketing was only up to 5 to 6 million. Why do they only not have the cost to print leaflets?*

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Because An-Nisa Hospital uses recommendation marketing strategy. Why not promotion but recommendations? Word of mouth from well-treated patients will elevate the hospital promotion...." (Director of An-nisa Hospital Tangerang).

Hospital Finance

An-Nisa Tangerang Hospital had a annual profit margin at 15-20% with a strategy to increase the service capacity and maximize the existing assets. By increasing the service capacity, the hospital's fixed cost will decrease and increase profit margins. The hospital also had a unit cost based on INA-CBGs, and thus the hospital management knew the group of diseases that are financially at risk. In addition, the hospital used generic drugs, control length of stay and improve diagnostic support to improve cost containment. The hospital's Cost Of Goods Sold (COGS) was only 10-12% of the total hospital costs. During the delayed claims from BPJS-Health, An-Nisa Tangerang Hospital utilized Supply Chain Financing (SCF) program to maintain their cash flow. The hospital also formed a good claim management with the timely delivery of claims files to BPJS-Health. Claims were scheduled to be sent every 3rd day and 21st day to BPJS-Health that has finished verifying.

"The pharmacy is no longer wandering around An-Nisa Hospital because all of the generic drugs are already in. Thus, they do not work on the hospital's pharmaceuticals. That is why I said that every doctor who wants to join in the hospital practice need to know that our target is to serve BPJS-Health patients. If doctors do not want to serve those patients according to INA-CBGS, they do not fit to the practice here " (Director of An-Nisa Tangerang Hospital).

"Basically, we have to do these things. First, the Director has an entrepreneurial spirit. Second, for cash flow, the hospital uses SCF. Third, the claim management must be timely. Fourth, open management..." (Director of An-Nisa Tangerang Hospital)

Hospital Innovation

An-Nisa Tangerang Hospital admitted that information technology was needed to improve the efficiency of services. Now, the hospital has implemented an Electronic Medical Record (EMR) for outpatient and inpatient services. Its strategic plan in 2020 was to use Artificial Intelligence (AI) technology to further enhance service capacity and cost efficiency. In the service aspect, the hospital prioritized customers' experience. The hospital provided free patient discharge services and gave small gifts to pediatric patients. The hospital had a good patient discharge system.

In the evening, the doctors made a list of patients who could be discharged the next day, and they completed the medical record, as well as patient administration. If the next day the patient was declared stable based on the nurse's examination, the patient would be sent home immediately without waiting for the doctor to visit. The hospital also formed a fraud prevention team that functions to detect "abnormal" events in the service. After the claim verification process was complete, the fraud team reviewed the problematic claim to decide whether or not the claim could be submitted to BPJS-

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Health.

"In 2019, we only implemented electronic medical records, so the casemix team, which had 12 people, left only 2 people because the doctor had written the diagnosis. We match with ICD X. If it suits right, the BPJS-Health cost would come out. It is a design that would be implemented in 2020..." (Director of An-Nisa Tangerang Hospital).

Table 1. Summary of Two Best Hospital Management Practice after JKN Era in Indonesia.

Description	Dr. Iskak Tulungagung District General Hospital	An-nisa Tangerang Hospital
Hospital Profile	- Classified as class-B teaching hospital - Having 13 specialist services and 7 subspecialist services with 476 beds. - Appointed as a District Referral Hospital which assign referrals from the Trenggalek Regency, Blitar City, Blitar Regency and Pacitan Regency. - Monthly outpatient, inpatients and emergency were 15,864; 2,713 and 3,703 respectively in 2018.	- Classified as class-C general hospital - Having 187 beds and 18 specialist services. - Monthly outpatient, inpatients and emergency were 17,491; 1,579 and 2,103 respectively in 2018.
Hospital Organization	- Operated independently as the Public Service Agency (BLU) - Having employees who work professionally.	- Human resources as the main asset of the hospital - The management provides scholarships to employees
Hospital Finance	- Diverting hospital construction funds to cover operational costs.	- Maximizing existing assets with 15-20% of annual profit margin. - Cost Of Goods Sold (COGS) at 10-12% of the total hospital costs. - Applying Supply Chain Financing (SCF) program to maintain hospital cash flow.
Hospital Strategy	- Low-cost hospital, high quality and hospital social responsibility strategy.	- JKN participants with a composition of 90% of total patients as the target market - A word of mouth recommendation from patients as the best marketing strategy
Hospital Innovation	- Establishing an Integrated Acute Coronary Syndroma Service System (LASKAR) for patients with cardiac arrest. - Developing maternal and child health services that are integrated with PSC.	- Developing information technology such as Electronic Medical Record (EMR) to improve the efficiency of services at the Hospital. - Building a good patient discharge system

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Contras with the result of this study, Irwandy and Sjaaf (2018) stated that 56% of hospitals in South Sulawesi were classified as inefficient within 4 years after JKN implementation. Research conducted by Harmadi and Irwandy (2018) assessing the efficiency level in government hospitals in Indonesia also found that 66.7% of class-A hospitals, 70.3% of class-B hospitals and 61.1% of class-C hospitals in Indonesia were classified as inefficient. In addition, Ross and Dutta (2019) did a survey to 61 private hospitals in collaboration with BPJS-Health and showed that efficiency only occurred in inpatient services.

This condition is also happened in other countries. Many hospitals hospitals were closed within 5 years of the introduction of the DRG payment system in America (Jane *et al.*, 2016). In Taiwan, the number of hospitals in 1995 was 787, which then decreased into 490 in 2016 due to the number of hospitals that closed or merged due to service inefficiencies, poor financial management, and low levels of competition (Chiang and Wang, 2015; Gilhawley, 2018; Kuo and Yang, 2018). In Germany, since DRG payment implemented in 2004, high hospital mergers and 19 hospitals were closed within 5 years of implementing the DRG payment system (Mullner and McNeil, 1986; Pilny, 2015).

Hospitals were demanded to carry out strategies to adapt with transformation that occurred due to the payment system reform. The four strategies were used to increase efficiency, reduce costs, create more flexible organization reform to adapt market changes, change the service culture oriented to increasing customer satisfaction, and improve hospital infrastructure. All of these strategies were focused on ensuring the long-term financial sustainability of hospitals in a changing market (Coughlin *et al.*, 2014).

Common Implemented Strategies

From this present study, the best hospital management practice at Dr. Iskak Tulungagung District General Hospital and An-nisa Tengerang Hospital could make them adapt and grow in the National Health Insurance (JKN) era. They have four common strategies implemented, such as efficiency in business process, investment in human resources, customer relationship management, and stakeholders' collaboration and support.

Efficiency in Business Process

Efficiency in hospital business process is the key to survive and thrive in National Health Insurance (JKN) era. Hospitals must regenerate a whole management and service process to operate efficiently. Regeneration process must focus on cost containment, transparency improvement and capacity improvement of hospital resources. Many hospitals were more focused on managing revenue rather on cost containment to insure profitability (Dewi, 2018). Whereas, with a proper cost containment strategy and optimalization of the capacity of resources which lead to reduce fixed costs, hospitals will get greater profit margins (Dong, 2015). Transparency is essential in reducing fraud and is easier to achieve with the help of technology and digitization tools. Both of Best Practice Hospital use information technology (computerized the management work flow) and digitalization (paperless work system) to cut administration bureaucracy, reach effectiveness in service delivery and cost efficiency. Research from University of Sidney proved that digitalization in healthcare providers could accelerate quality and safety of service and efficiency of organization process (Shaw, Hines and

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Kielly, 2018).

Investment in Human Resources

One of the top three reasons people leave organizations is the lack of interesting and meaningful development opportunities (Stokes *et al.*, 2013). According to the finding of this study An-nisa Hospital invest human resources with giving training and guarantee of further study to their staff. It is important because proper management of human resources is critical in providing a high quality of services (Kabene *et al.*, 2006). When hospital management can integrate learning process with performance, it becomes much more related to employees who see how their training program support their performance and positively impact patients (Sinha and Ojha, 2016). Another important aspect is to ensure employees' welfare to keep them engaged and happy, by developing strategies such as hospital social responsibility Glassdoor's research showed that happy employees would create happy costumers (Zhao and Chamberlain, 2003).

Customer Relationship Management

Both of hospital in this study retain the patients to willing visit back with giving the best service and they do not differentiate the health services between JKN and non-JKN patients. They also implement the strategy of proactive word mouth from the patients related to the good health services in the hospital. Research done by Blocker *et al.* (2011) revealed the impact of proactive costumer service could create robust effect to superior value, statisfication and loyalty of the costumers. Proactive approaches could be done by asking costumers for feedback, paying attention to what costumers need, and offering rewards for regular costumers as both hospital have been implemented. For example, both hospitals conducted a survey and word moth strategy to know the patients' feedback. Genesys Consumer Survey 2006 in USA showed that 88% of patients would have a more positive opinion of a hospital after receiving a call just to thank them for their visit or ask them how satisfied they are (Genesys, 2008).

Stakeholder's Collaboration and Support

According to the confirmation from informants from both hospitals, they collaborate their hospital management with several stakeholders such as owner, administrators, and medical doctors. The impact of collaboration with stakeholders is that the health system will improve the quality of care (partly by rationalization and optimization) and improve integrated care by increasing patient flow through vertical integration (De Regge *et al.*, 2018). Another study also concluded that hospital management requires collaboration from all stakeholders to ensure that the strategy can be carried out without significant obstacles (Pandi-Perumal *et al.*, 2015). District government hospitals should cooperate with regional leaders and local institutions to get policy support.

Various studies have shown that doctors' support is very important to shape changes in values and quality of hospital organization (Bradley *et al.*, 2001). Management support can increase the success of organizational change. Collaboration from doctors and management to understand the problems in hospital organizations is very important to determine changes in hospitals to improve efficiency (Nigam, Huising and Golden, 2014).

Owners, management and staffs must understand and be involved in the process of organizational change to reduce concerns for negative expectations. Throughout the process of

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organizational change, such as rebuilding hospitals, staffs need to be involved, adequately informed, and trained as they think the management and owners supported them. Champions of varying professions and leading departments can be used to increase a sense of involvement among actors in hospital organization (Pomare *et al.*, 2019).

This study has successfully documented the success of hospitals in surviving the era of national health insurance by conducting in-depth interviews directly with hospital directors from the government and private hospitals. However, the results of this study are limited to the ability and experience of researchers in exploring the experiences of informants. It is possible to change the strategy by the informants in the future.

CONCLUSION

This study concluded that the best hospital management practice to survive and thrive in the JKN era was carried out by implementing strategies and innovations to adapt with health care system reform. The similarities of strategies carried out by Dr. Iskak Tulungagung District General Hospital and An-Nisa Tangerang Hospital as the examples involved efficiency in business process, investment in human resources, customer relationship management, and stakeholder's collaboration and support. Government-owned and private hospitals in Indonesia could use the results of this study as references to thrive in the JKN era.

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CONFLICT OF INTEREST

The authors state that there is no conflict of interest for this article.

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ORIGINAL RESEARCH

ANALYSIS OF HOSPITAL INFORMATION MANAGEMENT SYSTEM USING HUMAN ORGANIZATION FIT MODEL

Analisis Sistem Informasi Manajemen Rumah Sakit dengan Human Organization Fit Model

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ABSTRACT

Background: Hospital is a health care institution that provides public services for patients. It needs computerized information technology, for example, a hospital information management system.
Aims: This study was aimed at analyzing the implementation of hospital management information system using the human organization fit model at the Outpatient Department of Sabang General Hospital.
Methods: This study was conducted from March-June 2020 using a cross sectional design. The study's population was the hospital managers, administration staff and health workers at the hospital. The study's sample size was 106 respondents selected using a purposive sampling. This study used a quantitative design in which the data analysis was done using a spearman correlation test with P-value of =<0.05. The independent variables were the quality of system, quality of information, and quality of care. While the dependent variables included system user, user satisfaction and organization. The data were collected through questionnaire distributed to the respondents.
Results: The quality of system did not have a relationship with the system user (P=0.585), user satisfaction (P=0.541), and organization (P=0.256). The quality of information had a relationship with the system user(P=0.004) and user satisfaction (P=0.000), but it did not have a relationship with organization (P=0.132). The quality of care had a relationship with the system user(P=0.000), user satisfaction (P=0.000) and organization (P=0.000).
Conclusion: The Sabang General Hospital, Aceh, needs to improve the hospital management information system with the HOT-fit model, especially the quality of system. They can conduct training for users and provide applicable and attractive manuals.

Keywords: hospital, information management system, quality of care, quality of information, quality of system.

ABSTRAK

Latar Belakang: *Rumah sakit merupakan institusi pelayanan kesehatan kepada pasien. Hal ini menuntut rumah sakit untuk menerapkan teknologi informasi berbasis computer seperti Sistem Manajemen Informasi Rumah Sakit.*
Tujuan: *Penelitian ini bertujuan untuk menganalisa penerapan dari Sistem Manajemen Informasi Rumah Sakit yang menggunakan human organization fit model* di Instalasi Rawat Jalan Rumah Sakit Umum Daerah Sabang.
Metode: *Penelitian ini dilakukan pada bulan Maret-Juni 2020 dengan desain cross sectional. Populasi penelitian ini adalah manajer rumah sakit, staf administrasi dan petugas kesehatan. Sampel dalam penelitian berjumlah 106 responden yang didapatkan melalui purposive sampling. Desain penelitian ini adalah kuantitatif dimana data dianalisis menggunakan korelasi spearman dengan skala ukur didasarkan pada nilai p =<0.05. Variabel independen dalam penelitian ini adalah kualitas sistem, kualitas informasi, kualitas pelayanan. Variabel dependen dari penelitian ini adalah sistem pengguna, kepuasan pengguna dan organisasi. Data dikumpulkan menggunakan kuesioner yang didistribusikan kepada responden.*
Hasil: *Kualitas sistem tidak berhubungan dengan sistem pengguna (p = 0.585), kepuasan pengguna (p = 0.541), dan organisasi (p = 0.256). Kualitas informasi berhubungan dengan sistem pengguna (p = 0.004) dan kepuasan pengguna (p = 0.000), dan tidak berhubungan dengan organisasi (p = 0.132). Kualitas perawatan berhubungan dengan sistem pengguna (p = 0.000), kepuasan pengguna (p = 0.000) dan organisasi (p = 0.000).*
Kesimpulan: *Penerapan dari Sistem Manajemen Informasi Rumah Sakit dengan Model HOT-fit di rumah sakit umum daerah Sabang, Aceh perlu ditingkatkan khususnya terkait kualitas system yang tersedia. Perbaikan kualitas sistem dapat diperbaiki melalui pelatihan kepada pengguna dan menyediakan sistem yang aplikatif dan menarik bagi para pengguna sistem.*

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***Kata kunci**: Rumah Sakit, Sistem Informasi Manajemen, Kualitas Sistem, Kualitas Informasi, Kualitas Pelayanan*

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INTRODUCTION

Health and information technology is growing rapidly. Currently, the field of health relies greatly on the development of information technology for fast and precise services provided to the community (Saputra, 2016). The information of technology can improve types of businesses, increase the efficiency and effectiveness of business processes, and make management decisions and work groups for health service providers that can be competitive in an ever-changing market later (Rusdiana, 2014). A study has shown that information management system can reduce the error rates, increase the quality system (Agustina and Susilani, 2018) and reduce diagnostic errors (El-Kareh, Hasan and Schiff, 2013). Alotaibi and Federico (2017) assert that an electronic medical record reduces medical errors and improves patient safety.

Hospitals are agencies providing public services that require a good information management system. This system has become a necessity and demand for hospitals to implement a computerized information and communication technology, known as hospital information management system. This system is also a perequisite from the government to to improve the hospital performance, efficiency, effectiveness, professionality, and services. The system implementation is common for all hospitals in Indonesia (Peraturan Menteri Kesehatan, 2013).

With the hospital information management system, hospitals could manage complicated problems, such as medical records and other administrative data (Sudiarti, Soepangat and Wiyono, 2019). It is necessary to evaluate the implemented system to determine aspects that improve the use of the system. Hospitals can develop this system by considering user needs and factors affecting the user and its benefits that the user obtains (Agustina and Susilani, 2018). The evaluation of the information technology must comprehensively involve to the hospital (Erimalata, 2016). The evaluation of quality of the ongoing information system is necessary to determine to which exent it provides services and gain user's perspective of their convenience and satisfaction with the system (Nofikasari and Sunyoto, 2017). The health information system could improve the patient care and reduce medication errors, as well as support clinical decisions effectively (Farzandipou *et al.*, 2017).

The Human Organization Fit Model proposed by Yusof et al. (2006) is one of the theoretical frameworks to evaluate information systems in the field of health services. It places the most important components in the information system: humans, organizations, technology and the compliance of those components (Diantono and Winarno, 2018). The information system considers some factors, such as the user, the frequency of use, training for the user, user's experience, knowledge, expectations, and attitudes towards the system. The user satisfaction is the overall evaluation of user's experience and social impact in using information systems (Ayuardini and Ridwan, 2019). The organizational component views the system from the organizational structure and environment. Besides, planning, management, system control, management support, financing and technology components are evaluated from the system quality, information

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quality and service quality (Poluan, Lumenta and Sinsuw, 2015).

Larinse (2015) and Saputra (2016) have discovered the quality of the system was not related to user satisfaction. Good user satisfaction and quality system do not indicate any problems in terms of human resource variable. Especially, human resources with high education levels and work experience may perform a high level of motivation and productivity (Diantono and Winarno, 2018). The hospital information management system is prominent for the hospital development. Without integrated, comprehensive, up-to-date and sustainable data, it is impossible to improve, prepare and consider a large amount of funds to improve the efficiency and effectiveness of hospital services (Saputra, 2016). An evaluation is necessary to identify the implementation of the hospital information management system as a reference for policy making from the user's perspective. Based on the background, this study aimed to analyze a hospital information management system using the human organization fit (HOT-fit) model at Sabang General Hospital, Aceh.

METHOD

This study was conducted in March-June 2020 with a quantitative design and cross-sectional approach. The population of this study was the hospital manager, administration staff and health workers in the General Hospital of Sabang, Aceh. The initial number of the respondents were 114 people, but 8 people could not be interviewed did not return the questionnaire distributed by the researchers. The final study's sample size was 106 respondents selected using a purposive sampling technique which took some criteria for the selected repsondents to be more representative.

The analysis indicator was that P-value should be equal or less than 0.05. There were three stages of data analysis: descriptive/univariate analysis and bivariate analysis. The univariate stage described variables, and the bivariate analysis using a spearman correlation test identified the relationship between variables (Dahlan, 2017). The dependent variables included the quality of system, quality of information, and quality of care. The quality of system was the user's subjective assessment on the system functions and implementation at the hospital. The indicators of this variable were its navigation, time to respond, the functions and availability of features, system reliability, completeness of the features, system flexibility, and system security. This variable was evaluated from some indicators: information completeness, accuracy, easy to read, punctuality, relevance, and consistency or clarity. The quality of care was the user' assessment on the services requested and received from the hospital information management. Its indicators included provider's responsiveness, guarantee, empathy, and technical support.

In addition, the study's dependent variables were the system user, user satisfaction, and organization. The system user was the frequency of using the information management system app. This variable's indicators involved navigation, user's needs and desires. The user satisfaction was a subjective response to the user's experience in using the information management system app. The variable's indicators varied from system completeness, accuracy, format, easy navigation and system accuracy. Another dependent variable was organization which was assessed from the hospital management aspect. App maintenance, employer commitment, and teamwork procedures were the indicators of organization variable.

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This study obtained data through questionnaire distributed to the respondents. Before conducting the research, the ethical approval was given by the Ethics Committee of Health Research, Faculty of Medicine, Syiah Kuala University, District General Hospital of Zainoel Abidin Banda Aceh.

RESULTS AND DISCUSSION

Respondents' Characteristics

There are four respondents' characteristics investigated in this study: gender, age, education level and type of work in the hospital structure.

Table 1. Respondents' Characteristics

Characteristics	n=106	%
Gender		
- Male	23	21.7
- Female	83	78.3
Age		
- 20-30	26	24.5
- 31-40	49	46.2
- 41-50	28	26.4
- 50-60	3	2.8
Education Level		
- Specialist doctor	11	10.3
- Master degree	1	0.9
- Bachelor degree	34	32.1
- Associate degree	60	56.6
Type of work		
- Management staff	15	14.2
- Health staff	87	82
- Insurance staff	4	3.8

Source: Primary data

The number of female respondents (78.3%) was more dominant than males (21.7%). Most of the respondents were at the age of 31-40 years(46.2%) and had Associate degree (56.6%). The respondents participating in this study were mostly health staff (82%).

Analysis of Hospital Management Information System Using HOT-Fit Model

A information management system is an integrated system providing information to support the operational activities, management and decision making of an organization. It is also an output resulted from the input of information from various processes to meet certain objectives in the management activities. The hospital's information system can influence the quality of care if properly repaired. Whether the system works well or not depends on the quality of information and types of services offered. An information management system app can support patient care and administration process in a relevant and accessible use, as well as flexible format that people in different locations can access. Service transaction data are collected, stored, processed, and documented to generate information about the quality of patient care and the hospital's service performance and costs.

The HOT-Fit model is the development of SI DeLone and McLean's success model by adding organizational factors and dimensions: structure and environment; technological, human and organizational factors, two ways of relationship between information quality and system use, information quality and user satisfaction, structure and environment, structure and net benefit, and environment and net benefit (Pamugar, Winarno and Najib, 2014). This study found that there are some meaningful use of the information management system. According to Ingebrigtsen *et al.*, (2014), the application of information management system can be a capture key patient health information, clinical decision support, facilitate reporting the quality of measures to inform quality improvement efforts and to facilitate cost of care. The system user can be assessed from the effects of work, efficiency and effectiveness of the system, communication, and low error rates by controlling expenses and costs. "Fit" is measured and analyzed using three factors, such as human, organization, and technology.

Univariate Analysis

Univariate analysis tests a single variable to identify the characteristics of the variable.

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The study shows that a half of the respondents thought the quality of the system was lacking (52.8%), and more than a half mentioned the quality of information given was good. The quality of the service was good according to most of the respondents (61.3%) in this study. Around 50 respondents (67.9%) considered the hospital has a good system user while 50 respondents (67.9%) felt dissatisfied with the system. Additionally, a half of the respondents (51.9%) thought the organization of the system was good.

Table 2. Univariate Analysis

Variable	n=106	%
Quality of system		
- Poor	56	52.8
- Good	50	47.2
Quality of information		
- Poor	46	43.3
- Good	60	56.6
Quality of care		
- Poor	41	38.7
- Good	65	61.3
System user		
- Poor	50	47.2
- Good	56	52.8
User Satisfaction		
- Poor	50	47.2
- Good	56	52.8
Organization		
- Poor	51	48.1
- Good	55	51.9

Source: Primary data

Table 3. Bivariate Analysis of Quality of System.

Variables	Results
System user	
- Quality of system	r = -0.054
- Spearman Correlation	p = 0.585 (>0.05)
User Satisfaction	
- Quality of system	r = 0.060
- Spearman Correlation	p = 0.541 (>0.05)
Organization	
- Quality of system	r = -0.111
- Spearman Correlation	p = 0.256 (>0.05)

Source: Primary data

Bivariate Analysis

This study used a correlation hypothesis using the Spearmen test to look at the relationship between the independent variables and dependent variables.

Table 3 shows the significance value was greater than 0.05 (0.585>0.05). It means that the quality of system was not related to system user. The information management system is a vital supportting tool for the hospital's operational management. Quick responses to services cause computer networks to be indispensable. A good computer network will have fast and integrated data flow which is also easily monitored. Besides, the test shows the quality of system had no relation with the system user due to server damage. The quality of system was poor because of limited system use (Munzir and Khaira, 2020). The system user by most users affects the quality of the system which naturally affects the users (Saputra, 2016). The perception of good quality will increase the user's enthusiasm to use the system. On the other hand, poor quality system will decrease the frequency of use. McGill et al. (2013) supports this assumption by saing that that improved perceptions of the quality systemmay affect users to use the system.

The bivariate analysis also shows that the quality of the system had no relation with the user satisfaction with the significance value greater than 0.05 (0.541>0.05). Soraya et al. (2019) asserts the users might gain the benefits of using better quality system. The improvement of information system and the stability of service providers will increase the frequency of system use which leads to improved user satisfaction (Poluan, Lumenta and Sinsuw, 2015). User satisfaction reflects how far users believe in an information system to meet their information needs. It was proven that the quality of system haaffected on user satisfaction (Saputra, 2016). If the system has technical difficulties, inadequate infrastructure and errors, it can reduce the level of user satisfaction (DeLone and McLean, 2003).

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Table 3 explains the quality of system was not related to the organization with the significance level of 0.05 (0.256>0.05). This findings might be triggered by no regular network maintenance for either software or hardware (Mudiono and Hernawati, Sri. Bukhori, 2018). Contrastly, the quality of system had a positive effect on the organization (Agustina and Susilani, 2018). Saputra (2016) finds that the organization needs to prepare the human resources to adapt to problems that may occur in the information system app (Saputra, 2016). According to Agustina and Susilani (2018), the organization had a positive effect on benefits to improve the system of hospital to be significant and directly.

In its use, the users often complained about the information management system app at Sabang Hospital. It indicates that the user satisfaction with the app was still low. The hospital management should respond to the complaints and find alternatives to solve it. Larinse (2015) and Saputra (2016) find the quality of the system is not related to the user satisfaction. Good user satisfaction and system use do not indicate any problems in terms of human resource variables. Especially, human resources with a high level of education and work experience may perform a high level of motivation and productivity (Diantono and Winarno, 2018).

Table 4. Bivariate Analysis of Quality of Information.

Variables	Results
System user	
- Quality of information	r = 0.278
- Spearman Correlation	p = 0.004 (<0.05)
User Satisfaction	
- Quality of information	r = 0.545
- Spearman Correlation	p = 0.000 (<0.05)
Organization	
- Quality of information	r = 0.147
- Spearman Correlation	p = 0.132 (>0.05)

Source: Primary data

The bivariate analysis in Table 4 explains that the quality of information was related to the system user with P-value of 0.004. The result shows that the quality of information had a positive effect on the system use. In other words, the better the quality of information, the higher the frequency of the system use (Soraya, Adawiyah and Sutrisna, 2019). Simialrly, (Nurlani and Permana, 2017) discover that the quality of information affected the use of the information system significantly.

Moreover, the level of accuracy and relevance of information data become the aspects that determine the quality of information (Yusof *et al.*, 2008). The accuracy of information is free from errors and unbiased. Meanwhile, the relevance of the information measures the benefits for the system users (Saputra, 2016). The relevance of information for each person varies. In other words, the quality of information is relatively based on the users' needs. When it meets the needs, it may be able to attract users to use the system. The respondents agreed that the quality of information was good, and thus the use of the system was relatively optimal.

The results show the quality of information contributed more to the use of the application compared to the quality of the application and the quality of the service. Besides, it is necessary to improve the quality of the system to produce good quality information for the users (Soraya, Adawiyah and Sutrisna, 2019). The quality of information by far had a relationship with the user satisfaction (P-value=0.000). This finding is in line with the research (Soraya, Adawiyah and Sutrisna, 2019) who find the quality of information could affect the user satisfaction.

Meanwhile, the quality of information had no relationship with the organization (P-value=0.132). In another study, the quality of information was also determined the organizational control consecutively(Erimalata, 2016). Good and responsible organizations can support the quality of information in the system.

Bayu and Izzati (2013) assert user satisfaction can improve if the system is good and precise with the its quality of technology. (Krisbiantoro, Suyanto and Taufiqluthfi, 2015) state user satisfaction

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had a positive and significant effect on the use of the system.

The information management system app provided by Sabang Hospital processes and integrates the entire flow of healthcare management processes through coordinated networks, reports and administrative procedures to obtain precise and accurate information quickly. Higher level of satisfaction suggests that a hospital has better quality performance and employees (Saputra, 2016).

Table 5. Bivariate Analysis of Quality of Care

Variables	Results
System user	
- Quality of care	r = 0.452
- Spearman Correlation	p = 0.004 (<0.05)
User Satisfaction	
- Quality of care	r = 0.375
- Spearman Correlation	p = 0.000 (<0.05)
Organization	
- Quality of care	r = 0.360
- Spearman Correlation	p = 0.000 (>0.05)

Source: Primary data

The result also shows there was a relationship between the quality of care and system user with P-value of 0.000. Another study also finds similar result that the service quality had a positive effect on the system user. When the system user has good qualities, the service quality will be better (Soraya, Adawiyah and Sutrisna, 2019).

This study also reveals that the quality of care had a relationship with the user satisfaction. Another previous study supports this finding as it finds that the quality of care had a significant positive effect on user satisfaction (Erlirianto *et al.*, 2015). Some factors that affect the quality of care are response speed, assurance, empathy and continued service, and the user satisfaction is a measure of perceived benefits and user attitudes towards an information system (Ayuardini and Ridwan, 2019).

In the same way, the quality of care was related to organization with the P-value of 0.00. Another study argues that the quality of care affected an organization where the support of top management and staff are the aspects of measuring a system (Soraya, Adawiyah and Sutrisna, 2019). According to (Habiburrahman, 2016), leadership of the top management support and staff also supports the success of system implementation. Besides, established policies or rules by the hospital management may push the quality of service and care much better.

The implementation of information system requires to measure the quality of the information system which can give hints on the quality of service and user satisfaction (Saputra, 2016). In achieving this target, the hospital management needs to handle complaints quickly to improve the user satisfaction (Nofikasari and Sunyoto, 2017). This study further uncovers that the quality of information system services was poor and had the most influence on user satisfaction. Therefore, the hospital should prioritize the quality of service to improve user satisfaction (Saputra, 2016).

The successful implementation of information management system app is measured from three components: technology, human and organization. The information management system app measures its technological component from the quality of its system, information, and frequency of use It also has something to do with the human component which is assessed from the use of the system and user satisfaction. Each aspect of the technology component affects the use of system and organization (Soraya, Adawiyah and Sutrisna, 2019). The organizational component will determine the use of the system which affects user satisfaction later on. In summary, the use of the system, user satisfaction, and organizational control will affect the implementation of information management system app (Habiburrahman, 2016).

CONCLUSION

The information management system integrates information to support the organizational operation, management and decision-making functions. It is an output of information system to meet certain objectives in managerial activities.

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The quality of information management system is measure from the quality of information and types of services offered. This system helps provide information about patient's care and administration requirements during its admission to the hospital in a relevant manner. Data in the system will be collected, stored, processed, and documented to generate information about the quality of patient care and hospital performance and service costs.

This study recommends the hospital needs to improve the quality of the system to encourage users use the system more frequently. Besides, the hospital needs to provide infrastructure for the operation of hospital information management system. Therefore, the policy makers should support to reduce problems in its operation. It is necessary to conduct training on the hospital information management system app to educate the staff to operate it well.

Regarding the app development, companies should develop the app features to make the system more attractive and easier for data recapitulation. This study highlights some limitations. For instance, the researchers in this study used an individual questionnaire to collect data. Therefore, the validity of findings between variables depends on the subjectivity of the respondents in filling the questionnaire. Finally, further research can identify the effect of variables which have not been investigated yet in the HOT Fit method or other methods.

CONFLICT OF INTEREST

There is no conflict of interest in this study.

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LITERATURE REVIEW

HEALTHCARE FAILURE MODE AND EFFECT ANALYSIS DESIGN FOR INDONESIAN HOSPITAL LABORATORIES: A LITERATURE REVIEW

Desain Healthcare Failure Mode and Effect Analysis untuk Laboratorium Rumah Sakit Indonesia: Tinjauan Pustaka

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ABSTRACT

Background: Error rate in medical laboratories is very low. Only one error is identified every 330–1,000 events. The goal of laboratory services should outweigh patient safety in a well-structured manner. Healthcare Failure Mode and Effect Analysis (HFMEA) is a proactive preventive method for identifying and evaluating potential failure.
Aims: This study identified factors affecting patient safety in hospital laboratories and described potential risk identification process using the HFMEA.
Methods: This study was conducted between March-July 2020 and retrieved data from PubMed, Scopus, and Google Scholar. The data were generalized and extracted into Table 1 based on factors dealing with patient safety in hospital laboratories. This study performed a risk identification design based on the steps of HFMEA.
Results: Out of 4,062 articles collected, only 8 articles between 2013–2020 were included for analysis. The highest error rate in laboratories occurred in the pre-analytic phase (49.2%–84.5%). The errors included clotted and inadequate specimen volume, and thus the specimens were rejected. Factors related to patient safety in laboratories were patient condition, laboratory staff performance (including training, negligence, and burnout), facilities, and accreditation.
Conclusion: The HFMEA process used the result of hazard analysis with severity and probability criteria categorized into health sector. Decision tree analysis could determine the next step of the work process. The HFMEA must be adjusted to the equipment and technologies in each hospital laboratory. Leader's commitment in monitoring and evaluation is required to maintain patient safety culture. More comprehensive data from Indonesian hospital laboratories are needed to generate more representative and applicable results.

Keywords: error, HFMEA, laboratory, patient safety

ABSTRAK

Latar Belakang: *Tingkat kesalahan di laboratorium medis sangatlah rendah. Satu kesalahan teridentifikasi pada 330–1.000 kejadian. Keselamatan pasien harus tetap diutamakan sebagai tujuan layanan laboratorium secara terstruktur.* Healthcare Failure Mode and Effect Analysis (HFMEA) *merupakan metode pencegahan proaktif untuk mengidentifikasi dan mengevaluasi potensi kegagalan.*
Tujuan: *Penelitian ini mengidentifikasi faktor-faktor keselamatan pasien di laboratorium rumah sakit serta menunjukan proses identifikasi potensi risiko menggunakan HFMEA.*
Metode: *Penelitian ini dilakukan pada Maret–Juli 2020 menggunakan data dari PubMed, Scopus, dan Google Cendekia. Data digeneralisasi dan ekstraksi dalam Tabel 1 berdasarkan faktor keselamatan pasien di laboratorium rumah sakit. Selanjutnya, proses identifikasi risiko dilakukan menggunakan HFMEA.*
Hasil: *Dari total 4.062 artikel yang didapat, sebanyak 8 artikel keluaran 2013–2020 digunakan dalam penelitian ini. Tingkat kesalahan tertinggi di laboratorium terjadi pada fase pre-analitik (49,2%–84,5%), di antaranya berupa clotting dan volume spesimen yang tidak mencukupi sehingga terjadi penolakan spesimen. Faktor yang berhubungan dengan keselamatan pasien di laboratorium berupa kondisi pasien, kinerja petugas laboratorium (termasuk pelatihan, kelalaian, dan stress kerja), fasilitas dan akreditasi.*
Kesimpulan: *Penerapan HFMEA menggunakan nilai hazard analysis dengan kriteria keparahan dan kemungkinan dikategorikan khusus bidang kesehatan. Decision tree analysis digunakan untuk menentukan langkah berikutnya pada tahap proses pengerjaan. Penerapan HFMEA perlu disesuaikan dengan fasilitas peralatan serta teknologi yang ada pada masing-masing laboratorium rumah sakit. Diperlukan komitmen pimpinan dalam monitoring dan evaluasi untuk menjaga budaya keselamatan pasien. Data lebih lanjut tentang*

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laboratorium rumah sakit Indonesia diperlukan untuk menghasilkan temuan yang lebih representatif dan aplikatif.

***Kata kunci**: eror, HFMEA, laboratorium, keselamatan pasien*

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INTRODUCTION

Patient safety is fundamental to provide essential health services (WHO, 2019). Medical practices have risks that can endanger patient safety and contribute to patient safety incidents due to unsafe health services. According to WHO, adverse events due to unsafe medical services are one of the top 10 causes of deaths and disabilities in the world, where nearly 50% of them can be prevented. Based on the previous study on patient safety in Spanish primary health centres, every 9.6 of 1,000 patient visits would produce adverse effect, although the degree of seriousness was low (Romero *et al.*, 2017).

Hospitals, a complex organization in providing quality services, need to care for the possible risks. The laboratory has an vital role in hospital activities and diagnosis of infectious diseases caused by parasites, fungi, bacteria, and viruses (Megiwati, 2015). According to Plebani (2002), almost 70% of patient's diagnoses and clinical treatment are based on laboratory results. Additionally, Jiang *et al.* (2014) mention 80%–90% of the laboratory test results play an essential role in establishing a patient's diagnosis (Carraro P, 2002; Jiang *et al.*, 2014). Another study has shown despite the low error rate in the medical laboratory compared to other units at the hospital, most of these errors rarely become an adverse event. Patient safety should be the goal of laboratory services, and the principles should be applied systematically in a well-structured manner (Aita *et al.*, 2017).

Research at Cantonal Zenica Hospital Bosnia–Herzegovina from December 2016–March 2017 analyzed 35,343 blood samples that were rejected in the laboratory information system due to pre-analytic errors, including haemolysis at 48.50%, clotting at 39.87%, unsuitable volume samples at 7.81%, wrong tube test at 2.16%, and identification errors at 1.66% (Kadić, Avdagić-Ismić, and Hasić, 2019). Lichenstein (2016) states that 82.8% of the errors in the laboratory were caused by human factors (errors performed by staff (43.5%), nurses (22.6%), and physicians (4.8%)). The majority of the laboratory errors (51.5%) were not associated with harm. As many as 17.4% of the patients were harmed due to the errors, 98.6% of the patients were temporarily harmed, and required treatment, and 0.7% of the patients were hospitalized or had their hospitalization prolonged due to the errors (Lichenstein *et al.*, 2016).

In 2001, the National Center for Safety Patient (NCPS) chose the traditional the Failure Mode and Effect Analysis (FMEA) approach as the basis for developing a risk analysis in the health sector (DeRosier *et al.*, 2002; Widianti, 2015). Based on the investigation results,, the NCPS explains the traditional FMEA was unable to meet the needs of the health sector. The NCPS believes that it is necessary to adjust risk assessment indicators in the traditional FMEA according to the health needs, and thus the concept of Healthcare Failure Mode and Effect Analysis (HFMEA) was born (DeRosier *et al.*, 2002; Widianti, 2015). Risk identification using the HFMEA is a proactive method to identify, evaluate, and record failure modes that cause problems and impacts. These will prevent potential

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risks that can endanger patients and health service staff (Colman *et al.*, 2019).

Some studies have found that the application of HFMEA reduced cases of specimen rejection from 0.92% to 0% in 2010–2013 (Chadwick and Fallon, 2012; Hung *et al.*, 2015). In this article, a literature review was performed to identify risks and factors of patient safety and also design a HFMEA for hospital laboratories.

METHOD

This study was literature review collecting articles from electronic databases such as PubMed, Scopus, and Google Scholar published in English and Indonesian between January 1, 2010-May 31, 2020. The literature search was conducted from March to July 2020 to search for electronic databases and selected journals, as well as cross-checking bibliographies from other published review articles through Mendeley to prevent duplicacy. The last step was all articles were reviewed by the clinical phatologist in an online final project presentation. This current literature review was a qualitative study that focused on identifying patient safety risks in hospital laboratories worldwide. Articles under review were journal articles, clinical trials, systematic reviews, observational studies, and descriptive studies that met the criteria based on Method Adopted for Literature Review by Turrini *et al.*, 2010.

The primary aim of this literature review was to identify risks and factors dealing with patient safety in hospital laboratories using the HFMEA or other methods. After the review process, the Healthcare Failure Mode and Effect Analysis for Indonesia hospital laboratories were designed based on the steps initiated by DeRosier *et al.* (2002). Articles using the HFMEA or FMEA were prioritized for more applicable analysis design in hospital laboratories. The full-text versions of all potentially relevant articles were read independently by the researchers. Eligibility for article inclusion criteria was determined by a structured flow chart and detailed guidelines using PRISMA Flow Diagram (Figure 1). A summary of literature review findings is presented in Table 1. This table outlines the basic characteristics of each article reviewed and briefly summarizes the key findings.

ANALYSIS AND DISCUSSION

A Figure 1 shows 4,062 articles collected were identified, but only 20 articles of them were full text. Finally, 8 relevant articles that met the criteria were included for review. All these included articles identified patient safety risks and factors in laboratories by using the HFMEA and other methods. The eight articles demonstrated the total testing process (TTP) in laboratories was divided into 3 phases, namely pre-analytic, intra-analytic, and post-analytic. The pre-analytical phase is the phase where the laboratory has no direct control on the process (Tournis and Makris, 2018) and occurs first in the laboratory process (Automation and Technology in the Histology Laboratory, 2018). The second phase is the intra-analytic phase, where the "actual" laboratory testing or the diagnostic procedures, processes, and products are conducted to ultimately produce results (Automation and Technology in the Histology Laboratory, 2018). The post-analytic phase is the final examination process which generates laboratory results. The highest error rate in laboratories occurred in the pre-analytic phase from 49.2%–84.5% (Hung *et al.*, 2015; Patel *et al.*, 2018). Errors in this phase were clotted specimens and

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inadequate specimen volume that may cause specimen rejection.

Factors that influenced patient safety in laboratories were patient condition, laboratory staff attributes including training, negligence, and burnout, facility, and accreditation. The review found only one article used the FMEA to identify risk and factors of patient safety in clinical laboratories, and one article integrated the Value Stream Map and HFMEA into Six Sigma method (see Table 1).

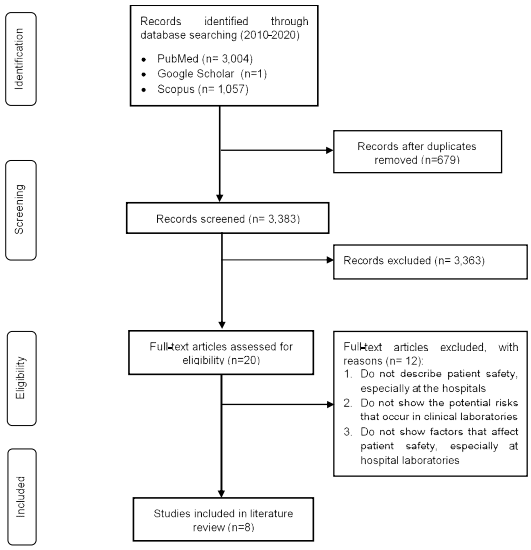

Figure 1. PRISMA Flow Diagram
(Source: Moher *et al.*, 2009)

Potential risks in laboratories

According to the Regulation of Indonesian Ministry of Health No. 411/MENKES/PER/III/2010, clinical health laboratories provide clinical specimen examination services to obtain individual health information, support disease diagnosis, cure the diseases and restore the health (Ministry of Health Republic of Indonesia, 2010). Aproximately 70%–80% of the laboratory results are related to diagnosis and treatment, and thus laboratories are important for health care and patient safety. They may have potential errors such as misdiagnosis, late diagnosis, inappropriate tests, patient safety incidents, cost and time loss (Sinici Lay, Pinar and Akbiyik, 2014; Aita *et al.*, 2017). The error rate in medical laboratories is very low (one error identified every 330–1,000 events) (Kalra, 2004); and the majority of these error rarely become adverse events (Plebani M, 1997), patient safety should be considered the goal of laboratory services and its principles must be systematically applied in a well-structured manner (Aita *et al.*, 2017).

The pre-analytical phase includes test request, patient or sample identification, sample collection, handling and transport, whereas pre-analytical phase involves the steps of samples preparation for analysis such as centrifugation, aliquoting and sorting. It has been demonstrated that most occur in the pre-analytical phase by healthcare personnnel who are not under control of the laboratory, but the majority of these errors are preventable (Gunnur Dikmen, Pinar and Akbiyik, 2015). Pre-analytical phase start following specimen acceptance by the laboratory staff (Lippi and Guidi, 2006).

According to Hung et al, most testing errors occur in the pre-analytical phase accounting for 84.5% of the total errors detected (Hung *et al.*, 2015). Patel et al, collected 172,800 data test performed on 43,200 samples, total number of errors were identified in pre-analytical phase (49.2%), intra-analytical (17.4%), post-analytical (33.4%) (Patel *et al.*, 2018). Jiang et al. who used FMEA in their research explain the highest RPN (Risk Potential Number ≥ 200) in clinical laboratories was in the pre-analytic phase. It occurred due to hemolysis, delay on delivery samples to the laboratory, and inadequate specimen volume (Jiang *et al.*, 2014).

Errors in the pre-analytic phase cause specimen rejection, mostly occurred due to clotting from 43.8%–55.8% (Sinici

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Lay, Pinar and Akbiyik, 2014; Bhat *et al.*, 2012; Guimarães *et al.*, 2012). Clotting was caused by improper blood mixing with anticoagulants (poor mixing method) and the wrong placement of the tube (Sinici Lay, Pinar and Akbiyik, 2014; Gunnur Dikmen, Pinar and Akbiyik, 2015). As much as 54.3% of clotting occurred to adult inpatients, and 26.8% pediatric inpatients (Sinici Lay, Pinar and Akbiyik, 2014). The second reason for specimen rejection is inadequate specimen volume at around 15%–24%, of which 1.8% indicates an excessive specimen volume (Bonini *et al.*, 2002; Plebani *et al.*, 2006, 2014; Guimarães *et al.*, 2012). Excessive specimen volume, particularly in pediatric, neonate, onclogy, and intensive care patients (56% in both adult and pediatric inpatients), occurred largely due to the difficulty in accesing peripheral veins of the patients (Sinici Lay, Pinar and Akbiyik, 2014).

Specimen rejection was caused by inappropriate test requests. As many as 16.97% of the physicians incorrectly determined the test according to patients' needs. Kachalia A, et al (2007) and Wahls and Cram (2007) support this result by stating that 55%-58% of the errors or delays in diagnosis were caused by the failure of the service unit or emergency department to determine appropriate tests according to patients' need (Kachalia *et al.*, 2007; Wahls and Cram, 2007; Patel *et al.*, 2018).

The errors frequency in the intra-analytic phase is around 7%-17.4%. The common errors include delay in reporting laboratory results due to malfunction of the equipment, sample mixing with other samples/ materials, interference (endogenous or exogenous substances), and undetected errors (Sakyi *et al.*, 2015; Patel *et al.*, 2018). This failure occurred in the re-sampling phase (Jiang *et al.*, 2014; Sciacovelli *et al.*, 2017). The final examination process, the post-analytic phase, Patel et al. (2018) stated that the percentage of the errors in the post-analytic phase was 33.4%, of which 12% were failure to report laboratory test results according to the predetermined time (Patel *et al.*, 2018). Jiang et al. (2014) obtain the highest RPN (RPN ≥ 200) due to failure to report test results according to the standard time (RPN = 210) and critical results (RPN = 200) resulting in delayed emergency treatment. The failure occurred due to the carelessness of laboratory staff, such as ignorance about complex work procedures in the laboratory and the inability to operate Laboratory Information System (LIS) or a computer-based technology (Jiang *et al.*, 2014).

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Table 1. Summary of Patient Safety Factors in Laboratories, 2013 to 2020

Factors	Key Findings	Authors	Titles	Results
Patient	Patient Condition	I Sinici Lay et al. (2014) Turki	Classification of reasons for rejection of biological specimens based on pre-preanalytical processes to identify quality indicators at a university hospital clinical laboratory in Turkey	Insufficient sample volume was identified at a clinical laboratory of university hospital in Turkey at a rate of 98.2%. Of the percentage, 1.8% of the samples exhibited the excessive volume, particularly for pediatric, neonate, oncology, and intensive care patients (56% on both adult and pediatric inpatient services), largely due to the difficulty in accessing peripheral veins.
Laboratory Staff	Errors due to laboratory staff	Patel S. (2016) India	Congruity in Quality Indicators and Laboratory Performance	High error rates could occur due to various reasons, such as lack of frequent training for laboratory and extra-laboratory staff, complexity of Total Testing Process (TTP) steps and involvement of different professionals in performing the process, shortage of staff, lack of automation in sample transport, and lack of lab-to-clinics interface through Laboratory Information Systems (LIS)
	Cause of errors in laboratory	Y Jiang et al. (2015) China	Application of failure mode and effect analysis in a clinical chemistry laboratory	The three failure modes with the highest RPNs (≥ 200) showed that the prominent problem existed in the pre-analytic phase, especially during the sample collection. It occurred due to unfamiliarity of technical work to the knowledge of nurses and couriers, increased workload, lack of laboratory knowledge of couriers.
	Staff training	I Sinici Lay et al. (2014) Turki	Classification of reasons for rejection of biological specimens based in pre-preanalytical processes to identify quality indicators at a university hospital clinical laboratory in Turkey	1. Some factors causing the high rates of clotted specimens from inpatient services involved the insufficient number of trained phlebotomy teams, high turnover of staff, particularly physicians. 2. Pediatric hospital staff showed better attention and better knowledge of specimen collection than those at the hospitals for adults.
	Staff negligence	Hung et al. (2015) Taiwan	Integration of Value Stream Map and Healthcare Failure Mode and Effect Analysis into Six Sigma Methodology to Improve Process of Surgical Specimen Handling	Specimen labeling errors and incomplete forms of specimen requisition were the major causes of specimen rejection. Some factors contributed to the errors in the specimen handling process. These include lack of discipline in completing surgical records, late data accuracy checking, lack of inspection mechanism, as well as the insufficient labor force.

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Factors	Key Findings	Authors	Titles	Results
		Y Jiang et al. (2015) China	Application of failure mode and effect analysis in a clinical chemistry laboratory	Errors in the post-analytic occurred due to carelessness of laboratory staff; for instance, the clinical laboratory results were often overlooked or not reported due to its complexity.
Laboratory Staff	Physician burnout	Kroft, S. H (2020) American Society for Clinical Pathology	Well-Being, Burnout, and the Clinical Laboratory	1. As many as 71% of the pathologists experienced burnout at some point. with a full one-third indicating that it was something they were currently experiencing. 2. Pathologists in the ASCP survey reported job-related stress, and 43% of them reported being moderately or very overwhelmed by their workload. 3. Burnout in lab professionals appears to be more prevalent than in pathologists and pathology trainees. About 85% of lab professionals sometimes experienced burnout. A half of them perceived it as a current issue. Over half experienced a lot of stress, and nearly half were moderately or very overwhelmed. Almost 40% were moderately or very anxious. This implies that the results were correlated with burnout.
Facility	Obsolete equipment	Gunnur Z D et al. (2013) Turki	Specimen rejection in laboratory medicine: Necessary for patient safety?	Barcode scanners may misread patient identifiication barcodes due to incompatible size of symbols on patient ID bands or specimen labels and the scanner settings.
		Sakyi A et al. (2015) Ghana	Evaluation of analytical errors in a clinical chemistry laboratory: A 3 year experience	Equipment malfunction and undetected failure in the internal QC were identified mainly as intra-analytical errors. Automation, training of laboratory staff and espousal of internal and external QC programs contributed immensely to the remarkable decline in intra-analytical errors and also the good condition of the Art Analyzer.
Accreditation	Accreditati-on related to error rate	V Tack et al. (2018) European Society of Pathology	Accreditation, setting and experience as indicators to assure quality in oncology biomarker testing laboratories	1. Accredited laboratories had 47% fewer analysis errors compared to non-accredited laboratories (IRR= 0.53, p= 0.030). It indicated that accredited laboratories had better implemetation procedures. 2. University and research settings were associated with less analysis errors than hospitals and (private) laboratories. While an industry setting showed less analysis errors compared to hospitals and (private) laboratories (p= 0.013 and p= 0.012)

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Patient safety factors in laboratory

Based on Table 1, there are 4 factors affecting patient safety in the laboratory.

Patient condition factor

Phlebotomists have difficulties to find peripheral veins of patients, especially in pediatric, neonatal, oncology, and ICU patients, during the blood specimen collection. It may result in the potential risk of inadequate specimen volume for laboratory analysis. Poor condition of patients and uncooperative attitude towards doctor's recommendations become the factors that may cause poor quality specimen (Jiang *et al.*, 2014; Sinici Lay, Pinar and Akbiyik, 2014).

Laboratory staff factor

Patel et al. (2018) assert that high error rates in the laboratory happen due to various reasons such as lack of training for laboratory staff, the complexity of the test procedures, involvement of many professional, lack of human resources, lack of automation in the delivery of samples to the laboratory, weak communication between laboratory staff and department staff (Patel *et al.*, 2018). According to Jiang et al. (2014), the failure in the pre-analytic phase during the sample collection was related to poor knowledge of nurses and couriers about working procedures in the laboratory.

Specimens clotting and hemolysis occur because phlebotomy training is rarely available to nurse or laboratory analysts (Sinici Lay, Pinar and Akbiyik, 2014;Sakyi *et al.*, 2015). Second, the high of turnover staff, especially doctors, also contributed to the errors in the laboratory. As new doctors need to adopt laboratory work procedures, they require training to improve their competence. The tight schedule of doctors and laboratory nurses also hampered their participation in prevention error training (Sinici Lay, Pinar and Akbiyik, 2014).

Research by Hung et al. (2015) has found that negligence of laboratory staff in labeling patient identification forms is another cause of specimen rejection. Negligence occurs due to low discipline in completing the surgical records, low data accuracy, and low inspection mechanism due to insufficient labour (Hung *et al.*, 2015). Jiang et al. (2014) have revealed that due to complex laboratory procedures, laboratory staff were careless in performing their work and thus cause failure in the post-analytic phase (Jiang *et al.*, 2014).

Burnout of laboratory staff also influences the potential risk in the laboratory. As many as 71% of the pathologists in the laboratory experienced burnout. Based on the American Society for Clinical Pathology, work stress is the main cause of burnout, and too much workload is another cause (43%). Most of the laboratory staff (85%) experienced burnout generally because of fatigue in handling the complexity of work in the laboratories. A study has found 40% of the staff experienced moderate to severe anxiety levels (Kroft, 2020).

Facility factor

Another factor contributing to the error is incompatible scanner that fails to read patient barcodes in the pre-analytic phase. Mismatch might occur between the barcode size, the symbol on the patient ID, andspecimen labels (Gunnur Dikmen, Pinar and Akbiyik, 2015). Equipment damage is the main cause of errors in the intra-analytic phase, causing laboratory test results not to be collected in the post-analytic phase. Equipment damage which is not detected in the internal quality control are identified as errors in the intra-analytic phase (Sakyi *et al.*, 2015).

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Accreditation factor

Accredited laboratories (47%) had a lower error rate than non-accredited laboratories (IRR 0.53; p 0.03). Laboratories of university hospitals or research laboratories had a lower error rate than private laboratories (p=0.013). Tack et al. (2018) have hypothesized a positive correlation between laboratory accreditation status and the accuracy of laboratory test results. Accredited laboratories are considered to have a higher level of caution in reporting analysis results to patients. Laboratories of university hospitals had a lower analysis error rate in conducting the analysis than non-university laboratories (Tack *et al.*, 2018).

Discussion

After identify risks and factors in clinical laboratories based on the articles that we have, the author design an Healthcare Failure Mode and Effect Analysis for Indonesia hospital laboratories based on the steps from DeRosier *et al.*, (2002). HFMEA is a traditional FMEA developed specifically for the health sector by NCPS in 2002 (DeRosier *et al.*, 2002). The HFMEA approach was developed to address criticism of using FMEA in healthcare, particularly in respect to the use of a single risk priority number (RPN) to rank vulnerabilities (Arbor, 2014). The process is the same as the traditional FMEA, but there are striking differences in the process, exactly on step 4 of calculating the risk value. In this step, the traditional FMEA assessment is the risk priority obtained from the multiplication of severity, occurrence, and detectability in non-health services. While in the application of HFMEA, the risk value of hazard analysis (see on Formula 1) is a multiplication of severity and probability with four criteria for health services (Table 2).

The use of the conventional FMEA is commonly applied to identify risk in hospital laboratories although the method needs improvements. A report mentioned that the laboratory of PKU Muhammadiyah Yogyakarta Hospital in 2015 employed the Root Cause Analysis (RCA) and Fishbone Analysis rather than the standard FMEA (Hospital Report: RS PKU Muhammadiyah Yogyakarta, 2015). Another study has shown that the laboratory of Wirobrajan Primary Healthcare Center carried out the standard FMEA by determining the cut-off point of the Risk Priority Number (RPN) to ease risk identification according to the error level (Khairani *et al.*, 2015). Research conducted by Sithi and Ani (2018) at Pacitan District General Hospital, East Java province, proved that the FMEA could reduce the RPN value from 250 to 125 for patient identification in inpatient supporting services (laboratory and radiology), pharmacy, and nutrition installations from June to September 2016 (Sithi and Widiastuti, 2018).

The advantage of HFMEA is the hazard scoring matrix process (Table 3). It is a grading method based on the hazard analysis value that determines the severity of the potential risk. After the determination of grading method, corrective action must be immediately planned through step 5 in the action and outcome measures, where the HFMEA team determine preventive steps to avoid potential risks or mitigation steps to minimize the impacts. Then, the team determine whether the failure mode assessed needs to be continued to the next process through the HFMEA Decision Tree Analysis. The decision tree analysis considers not only severity and probability scores, but also assesses the criticality of the failures (i.e, single point weaknesses) and whether there are controls in place to prevent or detect these failures. The use of “yes” or “no” responses in the HFMEA

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decision tree to asses the criticality, presence of control measures, and detectability of the failure mode is less subjective (B, NA and N, 2012) and more easily agreed upon than assigning scores (Chadwick and Fallon, 2012).

Healthcare Failure Mode and Effect Analysis Design

Based on the literature review, the author designed an HFMEA draft to identify potential risks in the laboratories. The laboratory procedures and potential risks in the HFMEA draft are retrieved from various studies that have been reviewed.

Step 1: Define the topic

The HFMEA design specially is applied in the pre-analytical phase because the highest error rate there ranges from 49.2% to 84.5% (Sinici Lay, Pinar and Akbiyik, 2014; Patel *et al.*, 2018).

Step 2: Assemble the team

The HFMEA team consists of multidisciplinary hospital staff who are directly involved in the laboratory risk analysis process. Generally, laboratory personnel consist of clinical pathology specialists, health analysts, nurses, and administrative staff (Ministry of Health Republic of Indonesia, 2010). The head of the clinical laboratory leads the team members during the HFMEA process and ensures them to follow the steps and record HFMEA results. The team members include staff with 5 years experience who fully participate in the implementation of HFMEA to advice based on their respective work experiences. In designing the HFMEA, the author used blood specimen collection process initiated by Jiang et al. (2014). Phlebotomists (nurses or laboratory analysts) would perform the blood specimen collection.

Step 3: Graphically describe the process

To identify potential risks, it is required to analyze all possible failure in each step. Figure 2 shows the flow of blood specimen sampling in a hospital laboratory. The sampling process consists of pre-analytic (5 stages), intra-analytic (2 stages), and post-analytic (2 stages) (Jiang *et al.*, 2014). The researchers took the scope in point 3 for the specimen collection because the error rate there had potential risk of specimen rejection. Then the subprocesses are reconfigured into the flowchart (Figure 3) to allow a list of failure modes in each subprocess. Each failure mode will be transferred to the HFMEA worksheet (Table 4) to analyze potential causes and assess the Hazard Score.

Hazard Analysis= *Severity* x *Probability*

Formula 1. Hazard Analysis

Step 4: Conduct a hazard analysis

The HFMEA team determined the hazard analysis value by multiplying two components of risk severity and probability (Table 2 with the Formula 1). After the hazard analysis values were obtained, the team determined the hazard scoring matrix (Table 3) (DeRosier *et al.*, 2002). The scoring is a simulation number taken by laboratory analysts to provide an overview of the HFMEA process. Table 4, in the decision tree analysis coloumn must be filled by the HFMEA team to make adjustments to the hospital laboratory conditions.

Step 5: Develop actions and outcome measures

At this stage, the team identified actions in accordance with the standard outcome measures, determined people in charge and required leadership commitment in the forms of monitoring and evaluation to develop patient safety culture in a laboratory (DeRosier *et al.*, 2002; Chadwick and Fallon, 2012).

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Table 2. HFMEA Probability–Severity Criteria

Score	1	2	3	4
Probability	**Remote**	**Uncommon**	**Occasional**	**Frequent**
	Unlikely to occur; may happen several times in 5–30 years	Possible to occur; may happen several times in 2–5 years	Probably will occur; may happen several times in 1–2 years	Likely to occur immediately or within a short period; may happen several times a year
Severity	**Minor event**	**Moderate event**	**Major event**	**Catastrophic event**
Patient Outcome	Neither injury nor increased length of stay or increased level of care	Increased length of stay or increased level of care for one or two patients	Permanent lessening of bodily functioning, disfigurement, surgical intervention required, increased length of stay for three or more patients	Death or major permanent loss of function or suicide
Visitor Outcome	Evaluation and treatment refused or not required	Evaluation and treatment for 1 or 2 visitors (less than hospitalization)	Hospitalization of 1 or 2 visitors	Three or more deaths or hospitalization of 3 or more visitors
Staff Outcome	First aid treatment only with no lost time or restricted duty injuries or illness	Medical expenses, lost time or restricted duty injuries or illness for one or two staff	One or more staff being hospitalized, or three or more staff experiencing lost time or restricted duty injuries or illnesses	One death or hospitalisation of three or more staff
Equipment or facilities	Damages of <$10000 without adverse patient outcome	Damages of >$10000 but <$100000	Damages of ≥$100000 but <$250000	Damages of ≥$250000

Source: Adapted VA National Center for Patient Safety (DeRosier et al., 2002; Vries et al., 2018)

Table 3. Hazard Scoring Matrix

		Probability			
	Scores	**Remote 1**	**Uncommon 2**	**Occasional 3**	**Frequent 4**
Severity	**Minor 1**	1	2	3	4
	Moderate 2	2	4	6	8
	Major 3	3	6	9	12
	Catastrophic 4	4	8	12	16

Source: DeRosier et al., 2002

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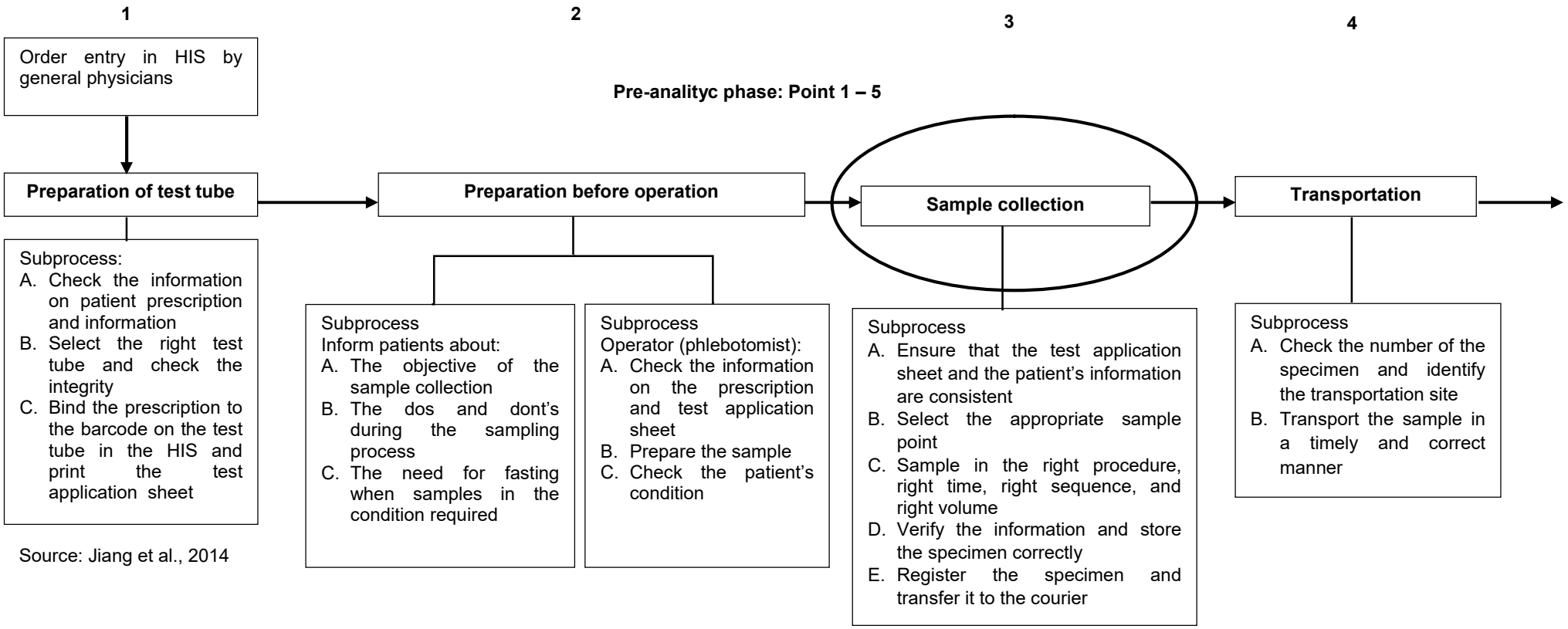

Source: Jiang et al., 2014

Figure 2 (a). Flowchart of blood specimen handling process

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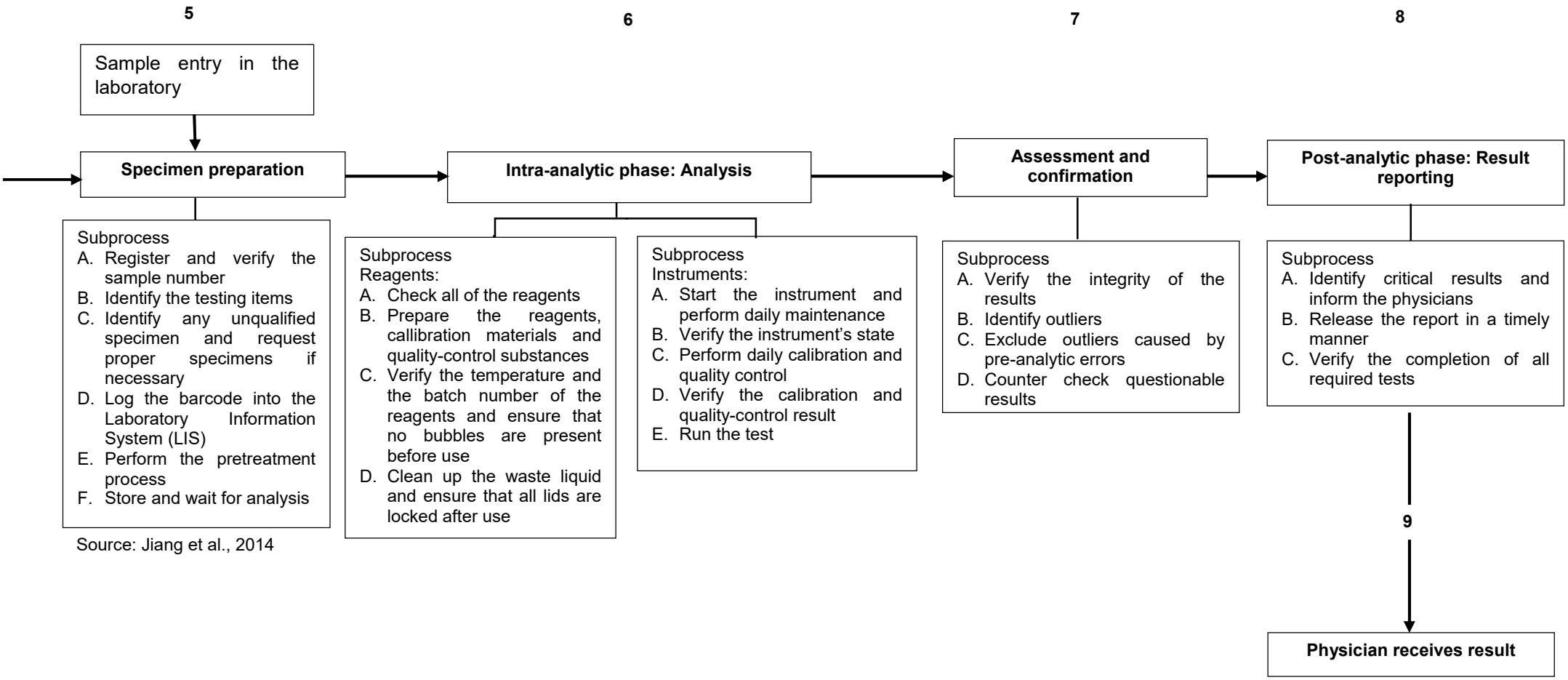

Source: Jiang et al., 2014

Figure 2 (b). Flowchart of blood specimen handling process

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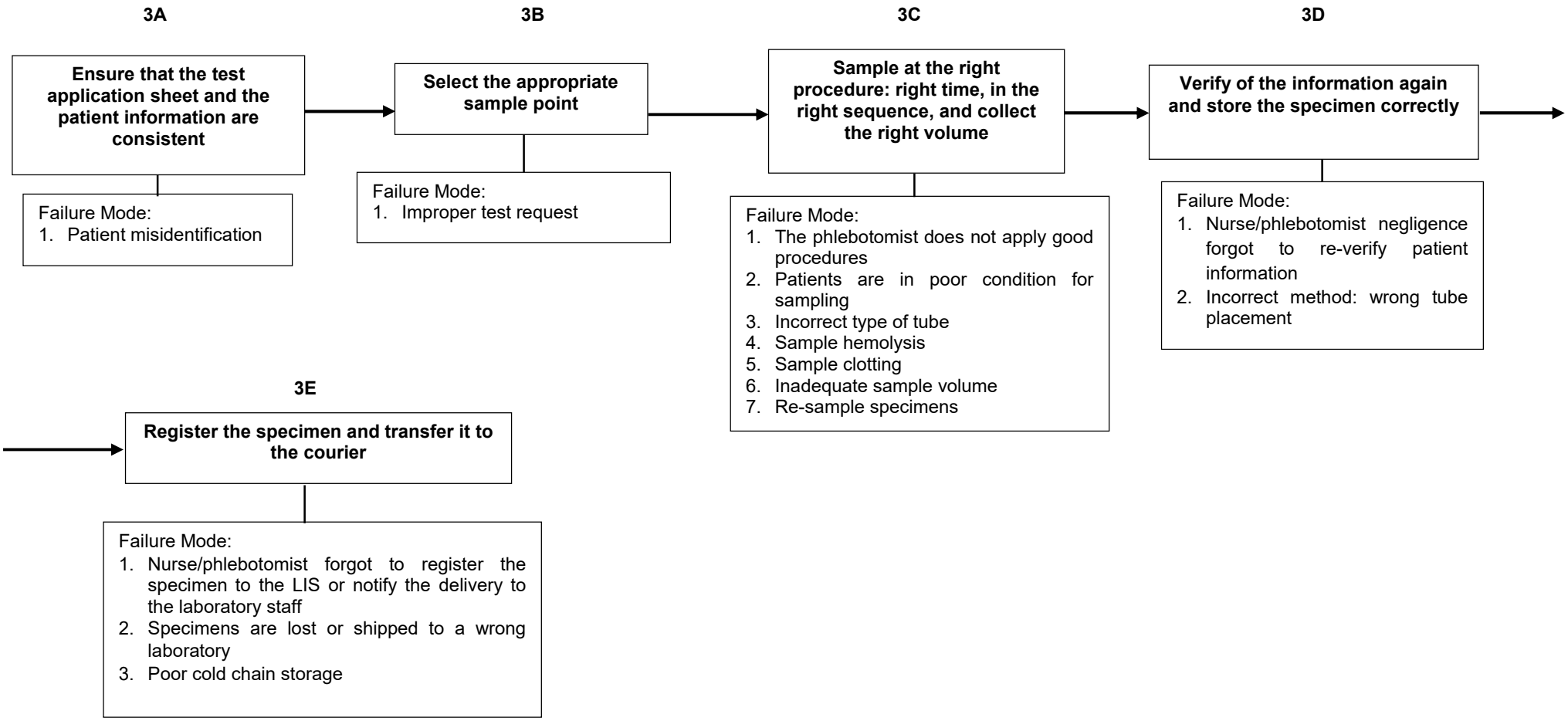

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Figure 3. Failure mode of blood specimen handling

Table 4. HFMEA Worksheet

		HFMEA Step 4: Hazard Analysis*							HFMEA Step 5: Develop Action & Outcome Measures*				
		Scoring**			Decision Tree Analysis								
Failure Mode: First evaluate failure modes before determining potential causes	**Potential cause**	**Severity**	**Probability**	**Hazard Score (S x P)**	**Single Point Weakness? Existing Control Measure**	**Detecable**	**Proceed**	**Action Type (Control, Accept, Eliminate) or Rationale for Stopping**	**Action**	**Outcome Measure**	**PIC**	**Management Concurrence**
3A1 Patient misidentification	Negligence of laboratory staff: Patient information is not checked carefully	2	4	8	N	N	Y	Control	Re-identification	Review patient identity	Lab Supervisor	YES
	Lack of training	1	3	3								
3B1 Improper test request	Laboratory staff burnout	3	3	9								
	Negligence of Laboratory staff	2	3	6								
3C1 Poor application of procedures by the phlebotomists	Poor knowledge of nurses about associated laboratory test	1	2	2								
	Laboratory staff burnout	1	2	2								
3C2 The patient is in poor condition during sampling	Failure to inform about an objection	1	2	2								
	Failure to inform patients about intentions	1	2	2								

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		HFMEA Step 4: Hazard Analysis*						HFMEA Step 5: Develop Action & Outcome Measures*			
		Scoring**			Decision Tree Analysis						
Failure Mode: First evaluate failure modes before determining potential causes	**Potential cause**	**Severity**	**Probability**	**Hazard Score (S x P)**	**Single Point Weakness? Existing Control Measure**	**Detecable**	**Proceed**	**Action Type (Control, Accept, Eliminate) or Rationale for Stopping**	**Action**	**Outcome Measure**	**PIC**	**Management Concurrence**
3C3 Incorrect types of tube	Nurse negligence	2	3	6								
	Lack of training	2	2	4								
	Internal control failure	2	3	6								
3C4 Sample hemolysis	Difficulty in sampling patient's vascular condition	1	4	4								
	Lack of training	1	3	3								
3C5 Sample clotting	Lack of training	1	3	3								
	Improper usage/ storage/ transportation of quality material or other reasons	1	3	3								
3C6 Inadequate sample volume	Lack of training	1	3	3								
3C7 Re-sampling specimens	Patients in poor condition	1	3	3								
	Nurse negligence	2	2	4								
	Lack of training	2	2	4								
	Improper usage/ storage of quality-control material or other reasons	2	2	4								

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		HFMEA Step 4: Hazard Analysis*						HFMEA Step 5: Develop Action & Outcome Measures*			
		Scoring**			Decision Tree Analysis						
Failure Mode: First evaluate failure modes before determining potential causes	**Potential cause**	**Severity**	**Probability**	**Hazard Score (S x P)**	**Single Point Weakness? Existing Control Measure**	**Detecable**	**Proceed**	**Action Type (Control, Accept, Eliminate) or Rationale for Stopping**	**Action**	**Outcome Measure**	**PIC**	**Management Concurrence**
3D1 The nurse/ phlebotomist negligence: forgot to re-verify patient information	Nurse negligence	2	2	4								
	Lack of training	1	2	2								
3D2 Incorrect method: wrong tube placement	Improper usage/ storage of quality-control material or other reasons	2	2	4								
	Lack of training or nurse negligence	1	2	2								
	Internal control failure	2	2	4								
3E1 The nurse/phlebotomist forgot to register the specimen to the LIS or to notify the sample delivery to the laboratory staff	Laboratory staff negligence: operator's failure to input information	2	3	6								
	Laboratory staff burnout	2	2	4								
3E2 Specimens are lost or shipped to a wrong laboratory	Incorrect transportation method, courier negligence	2	3	6								
	Lack of courier training	2	2	4								

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		HFMEA Step 4: Hazard Analysis*							HFMEA Step 5: Develop Action & Outcome Measures*				
		Scoring**			Decision Tree Analysis								
Failure Mode: First evaluate failure modes before determining potential causes	**Potential cause**	**Severity**	**Probability**	**Hazard Score (S x P)**	**Single Point Weakness?**	**Existing Control Measure**	**Detecable**	**Proceed**	**Action Type (Control, Accept, Eliminate) or Rationale for Stopping**	**Action**	**Outcome Measure**	**PIC**	**Management Concurrence**
	Improper usage/ storage/ transportation of quality-control material or other reasons	4	3	12									
	Courier overload	2	3	6									
3E3 Poor cold chain storage	Improper storage/ transportation of quality-control material or other reasons	2	2	4									
	No specimen delivery box	2	2	4									

*HFMEA Steps 4 – 5 filled by the HFMEA team during the Focus Group Discussion
**The scoring is a simulation done by laboratory analysts to provide an overview of the HFMEA process

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CONCLUSION

Laboratories apply the HFMEA by using the hazard analysis, where the severity and probability criteria are categorized for the health sector. Decision tree analysis is a step to determine whether the failure mode is feasible to proceed to the next HFMEA step or not. This can reduce the work process that does not involve the HFMEA team. The use of HFMEA must be adjusted using existing equipment and facilities, that can lead hospital laboratories to different potential risks. Laboratories also need staff leadership commitment by conducting monitoring and evaluation to maintain patient safety culture. In this study, the HFMEA design can be used by hospital laboratories but needs further research analyzed laboratory data in the Indonesia for more representative and applicable references.

To Indonesian health policymakers, the researchers suggest improving the regulations in 411/MENKES/PER/III/2010 about Clinical Laboratories, especially for risk identification to maintain the quality of hospital laboratories. In implementing the HFMEA, it is necessary to point a team and conducy a Focus Group Discussion (FGD) to determine priority measures that can prevent errors in hospital laboratories

CONFLICT OF INTEREST

The authors indicated no potential conflict of interest.

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ORIGINAL RESEARCH

THE RELATIONSHIP BETWEEN CAREER LADDER AND NURSES JOB SATISFACTION AT A HOSPITAL

Hubungan Jenjang Karir dengan Kepuasan Kerja Perawat di Rumah Sakit

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ABSTRACT

Background: Career ladder is given to nurses to encourage and maintain professional development and practice of nursing. Career ladder has an impact on raising clinical levels, promotion opportunities, competency complexity, rewards and recognition. In this study, the career ladder has started by mapping and conducting, credentials and competency assessment at the levels of pre Nurse Clinicians, Nurse Clinicians Level I and Nurse Clinicians Level II. Almost half of the nurses were dissatisfied (47.2%) with their career development.
Aims: This study was to analyzed the relationship between the career ladder and nurses' job satisfaction.
Methods: This study was a quantitative correlational study with a cross-sectional approach. There were 108 nurses as samples selected using consecutive sampling techniques. These respondent who met the inclusion criteria came from Inpatient Room, (i.e VVIP, VIP, Class I, Class 2/3, Ophthalmology Inpatient), Polyclinic, Chemotherapy Unit, NICU (Neonatal Intensive Care Unit), ICU (Intensive Care Unit), Hemodialysis, Emergency room and COT (Centra Operation Theater). Data were analyzed using the Spearman test.
Results: There was a significant relationship between career ladder (p=0.000) and nurse' job satisfaction. The nurse were satisfied with her career development related to implementation of career ladder. Besides, career ladder allowed to be promoted as the heads of the rooms. Rewards and recognition of nurses' competencies through job promotion affected nurses' satisfaction.
Conclusion: Career ladder affects nurse satisfaction. Nurses can advance their careers through a career promotion, competencies, rewards and recognition from other health professionals. Support from nurse manager is needed as a form of mentoring and evaluation of nurse performance in the career ladder.

Keywords: career ladder, job satisfaction, nurses

ABSTRAK

Latar Belakang: *Jenjang karir merupakan pengembangan karir perawat sebagai bentuk tingkatan jenjang karir untuk mendorong dan memelihara pengembangan profesional dan praktek keperawatan. Jenjang karir memberi dampak pada kenaikan level klinik, kesempatan promosi, kompleksitas kompetensi, penghargaan dan pengakuan. Jenjang karir dalam penelitian ini dimulai dari tahap mapping, kredensial dan penilaian kompetensi pada level pra PK, PK I dan PK II. Berkaitan dengan pengembangan karir sejumlah perawat kurang puas sebesar 47,2%.*
Tujuan: *Tujuan penelitian ini adalah untuk menganalisis hubungan jenjang karir dengan kepuasan kerja perawat.*
Metode: *Metode penelitian ini adalah penelitian kuantitatif korelasional dengan pendekatan cross-sectional dengan sampel sebanyak 108 perawat yang diambil dengan menggunakan teknik consecutive sampling. Sampel tersebut tersebar di Ruangan Rawat Inap (yaitu VVIP, VIP, Kelas I, Kelas 2/3, Rawat Inap Mata), Poliklinik, Kemoterapi, NICU (Neonatal Intensive Care Unit), ICU (Intensive Care Unit), Hemodialisa, IRD (Instalasi Rawat Darurat) dan COT (Centra Operation Theatre) yang memenuhi kriteria inklusi. Data dianalisis dengan menggunakan uji Spearman.*
Hasil: *Hasil analisis menunjukkan ada hubungan signifikan antara jenjang karir (p=0,000) dengan kepuasan kerja perawat. Perawat merasa puas dengan pengembangan karirnya terkait peningkatan level kliniknya. Disamping itu pula, kesempatan mendapatkan promosi sebagai kepala ruangan pun dapat diperoleh melalui jenjang karir. Penghargaan serta pengakuan terkait kompetensi yang dimiliki perawat melalui jenjang karir mempengaruhi kepuasan perawat.*
Kesimpulan: *Jenjang karir berpengaruh pada kepuasan perawat. Perawat dapat meningkatkan karir melalui sistem promosi dalam jenjang karir, kompetensi, reward dan pengakuan dari rekan profesi kesehatan lain. Dukungan manajer keperawatan sangat diperlukan sebagai bentuk peran atasan untuk membimbing dan menilai perawat dalam mengikuti jenjang karir.*

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***Kata kunci**: jenjang karir, kepuasan kerja, perawat*

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INTRODUCTION

Nursing takes an important role in providing health services to patient and community. Nurses provide professional nursing services to individuals and the community and keep being evaluated for the quality and security guarantees (Potter and Perry, 2009). Nurses perform services to patients for 24 hours assigned per shift. The number of nurses at hospitals is the largest and thus affects the quality of nursing services. Therefore, nurses are expected to provide excellent professional skills to improve the quality of nursing services. Efforts to develop competence and professionalism as well as give appreciation to nurses could be done through career development.

Career development is a personal improvement to achieve a career plan and work plan according to the level in an organization (Ardana, Mujiati and Utama, 2012). Nursing career development systems have been developed and implemented in various countries such as the United States, Norway, China, Thailand, Japan, and others countries. Career development, therefore, can be carried out through a career ladder.

Career ladder is a system to improve performance and professionalism, in the work field through increased competence (Indonesian Ministry of Health, 2013). Career ladder offers the opportunity to pursue certain clinical, educational, research, or managerial-focused pathways and to measure nurses' achievement (Kelly, 2010). The clinical level encourages and maintains professional development and practices of nursing, for example, family care (family-centered care), patient advocacy, patient and family education, assessment skills, critical thinking and understanding of the health care system (Burket *et al.*, 2010). Benner (1982) stated that a career ladder model illustrates five levels of skill development including novice, advance beginner, competent, professional, and expert. The implementation of such the model in Indonesia and other countries uses Benner's theory development to the level of researchers. The career ladder consists of clinical nurses, nurse managers, educator nurses and research nurses. Career ladder provide benefits in career development, promotion systems, competency complexity, rewards and recognition (Benner, 1982; Swansburg and Swansburg, 2000).

Career development is career planning and actualization as a critical life process that involves individuals and employees (Marquis and Huston, 2010). Career development is a significant opportunity for professional and educational development in an organization (Cowden and Cummings, 2012). Career ladder in nursing jobs provides opportunities to improve quality and competence through formal and non-formal training and education. Professional behavior such as education, leadership and team's morale will increase through career ladder since, promotional opportunities affect nurse' satisfaction of nurses (Zehler *et al.*, 2015; Lu, While and Louise Barriball, 2005). Promotion could uplift nurses' careers in terms of management, education or research. To have promotional opportunities professional nurses could experience professional career ladder (Swansburg and Swansburg, 2000).

The complexity of competencies becomes a challenge for nurses. Nurses have responsibilities to provide nursing care according to their competency based on the career level (Benner, 1982). Increasing nurses' competence through career ladder allows for continous professional development. Continous professional development is a process undertaken to maintain and renew the development of health services through high standards of professional practice (Indonesian Ministry of Health, 2013). On the other hand, rewards and recognition are the benefits of career ladder. Nurses in career ladder will receive recognition and rewards through higher salary and career

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mobility that show expertise, management and teaching skills (Pullen, 2017).

Career ladder in nursing career in Indonesia refers to government policy, i.e Presidential Regulation No. 8 of 2012 about the Indonesian National Qualification Framework, Minister of Health Regulation No. 49 of 2013 about the Nursing Committee and the Competence Building of Indonesian National Nurses Association (PPNI). Nurses' need to have competence in performing acute and ethical nursing care according to the career ladder, which consists nurse clinicians, nurse managers, nurse educators and nurse researchers (Indonesian Ministry of Health, 2013). Nurse clinicians are nurses who provide direct nursing care to patients/ clients as individuals, families, groups and communities. Nurse managers are the one who manage nursing services in health facilities and act, as a front line manager, middle-level manager and top-level manager. Nurse educators are nurses who provide education to students in nursing educational institutions. Nurse researchers are nurses working in nursing research. The implementation of career ladder for nursing has been developed at 9 hospitals such as Persahabatan Hospital in Jakarta, Fatmawati Hospital in Jakarta, Hasan Sadikin Hospital in Bandung, Soetomo Hospital in Surabaya, Petrochemical Hospital in Gresik, Adam Malik Hospital in Medan, Wahidin Sudirohusodo Hospital in Makassar and Hasanuddin University Hospital in Makassar (Indonesian Ministry of Health, 2013).

Nursing career ladder advantageous for increasing work morality and reducing career deadlock (Indonesian Ministry of Health, 2006). The implementation of career ladder will improve the lowest career level to the highest level. Hasanuddin University Hospital as one of the hospitals in Eastern of Indonesia that has performed career ladder since 2012 has been continuing to develop nursing career. Nursing career ladder is carried out by establishing clinical levels for nurses according to mapping, credentials and competency. Mapping and assessment at the pre Nurse Clinicians, Nurse Clinicians Level I and Nurse Clinicians Level II. Competency assessments is performed at the pre Nurse Clinicians and Nurse Clinicians Level I (Nursing Management Department, 2016).

A previous study found nurses also showed satisfaction at work because they could gain personal and professional development and opportunities for career advancement through career ladder (Bjørk, Hansen, *et al.*, 2007). In other the words, career ladder system for advancing career has an impact on nurse' job satisfaction. Nurses with a higher career level will be more satisfied than nurses with a low career level (Riley *et al.*, 2009; Bitanga and Austria, 2013).

The previous assesment of job satisfaction with the existing career development showed 47.2% of the nurses felt dissatisfied. These nurses worked in different units, such as inpatient rooms (VVIP, VIP, Class I, Class 2 & 3, Ophthalmology Inpatient), Polyclinic, Chemotherapy, NICU (Neonatal Intensive Care Unit) , ICU (Intensive Care Unit), Haemodialysis, Emergency room and COT (Central Operation Theatre) (Human Resource of Hasanuddin University Hospital, 2015). This previous study suggested that nurses were quite satisfied with the career ladder applied. Besides career advancement, it is necessary to improve skills through career ladder.

Efforts to improve career as a job satisfaction factor cause nurses to leave their jobs. This situation is, known as turnover. Research by Bjørk *et al.* (2007) found nurses who can uplift their career level would want to continue working at hospitals. Similarly, Chae *et al.* (2015) found the career ladder system could result in low desire to leave the hospital. Besides that, several of nurses are still young and have not been entitled as civil servants/PNS. The temporary contract, could force nurses to develop their career at other hospitals. The number of nurses turnover in 2015 was 3 people and increased by 13 people in 2016 (Human Resource of Hasanuddin University Hospital, 2016). This becomes concern for the Hospital to apply a career ladder system.

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Nurses' career ladder is expected was supposed to develop nurses' careers and provide them incentive/remuneration in addition to apart from monthly salary given to nurses as a form of an appreciation and recognition. The preliminary data obtained suggested that some of nurses were quite satisfied with their career development although there is a need for clear career advancement and its impact on nurse satisfaction It became the basis for researchers to carry out research about the career ladder that affect job satisfaction of nurses this study aimed to identify the relationship between the career ladder and nurses' job satisfaction.

METHOD

The design of this study was correlational quantitative, aiming to examine the relationship between two or many variables in one group (Grove, Gray and Burns, 2015). This study used a cross-sectional approach to assess the relationship between the career ladder and nurses' job satisfaction.

The number of respondents was determined by 10% of accuracy value, and the determination of sample size was calculated using the Isac & Michael table 188 population with a value of α (0.01). As many as 108 people as sample was obtained by using consecutive sampling in which all participating subjects with inclusion criteria were included until the required number was fulfilled (Sastroasmoro and Ismael, 2010). These respondents were nurses who worked in Inpatient Room (i.e VVIP, VIP, Class I, Class 2 & 3, Ophthalmology Inpatient), Polyclinic, Chemotherapy, NICU (Neonatal Intensive Care Unit), ICU (Intensive Care Unit), Haemodialysis, Emergency room and COT (Central Operation Theatre). The respondents fulfilled the inclusion criteria, i.e., willing to participate in the study and undergoing pre-nurse clinician level to Nurse Clinician Level II.

The research instrument used was questionnaires about career ladder and job satisfaction. As for the career ladder questionnaire, this study adopted the instruments used by Suroso (2011). The questionnaire is comprised of respondent's characteristics which are age, gender, marital status, education (bachelor's, master's and doctorate's degrees), period of work, and level of clinical career ladder. This study defines career ladder as a system for advancing a nursing career by levels aimed to promote and develop career through promotion system, competence, rewards and recognition. The career levels vary from pre nurse clinicians who just graduated from both bachelors of nursing and masters of nursing and had no work experience; nurse clinicians at level I are nurses who graduated from bachelors of nursing or maters of nursing and had 2year work experience and had passed a clinical authority test. In addition to that, nurse clinicians at level II are those who graduated from bachelors of nursing or masters of nursing and had 3-5 years of work experience, as well as had passed a clinical authority test.

Career development refers to career planning and management efforts, especially the nurse leader to organize career promotion for nurse clinicians. A promotion system in the career ladder provides nurses with an opportunity to upgrade their position to be clinicians, managers, educators, and researchers. Competence refers to the complexity of nurse's authority based on the career levels. Rewards in the career ladder are the act of giving incentives to nurses according to their career levels. Career ladder provides recognition of authority as well as improves competence and opportunities for nurses to make decisions in nursing care based on the career levels. Career ladder as an independent variable was measured using Likert scales which are Strongly Agree, Agree, Disagree and Strongly Disagree. While job satisfaction became a dependent variable that can describe nurses' attitudes towards work situations and work behavior to obtain equal rewards and welfare. Job satisfaction was also measured using the

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same Likert scales as for the career ladder.

Data analysis test used univariate and bivariate analysis. The data analyzed through the univariate test were age, gender, education, length of work, level of clinical ladder, and job satisfaction. The results of the univariate test are presented in the form of frequency, percentage, mean, and standard deviation. The bivariate analysis used the Spearman correlation test. The Spearman correlation test could assess the correlation between numerical and numerical variables, if the two variables were not normal (Dahlan, 2014). Bivariate test was in use to assess the relationship between the independent variable (career ladder) and the dependent variable (nurses' job satisfaction). If a p-value is < 0.01, it means there is a relationship between the independent variable and the dependent variable.

This research has obtained the ethical clearance from the Ethics Committee of the Faculty of Medicine, Hasanuddin University with ethics number of 336/H4.8.4.5.31/PP36-KOMETIK/2017. Based on the common research ethics, before getting the respondents' consent, research objectives were explained first to the respondents. After that, informed consent sheets were distributed when the respondents agreed the research participation procedures. The respondents signed the informed consent forms and then were given questionnaires to be filled in. To maintain the confidentiality of respondents, initials of respondents' name were used.

RESULTS AND DISCUSSION

In this part, the results of the relationship between career ladder and nurses' job satisfaction were further explained.

Table 1 shows the demographic distribution of nurses. Most of the nurses are female (78.7%). As many as 74.1% of bachelors of nursing. Most of the nurses (55.6%) were at the Nurse Clinician Level I. The average age of the respondents was 28 years, and the average period of work as 2 to 7 years.

Table 2. The Relationship between Career Ladder and Nurses' Job Satisfaction

Variable	Job satisfaction		
	n	r	p value
Career Ladder	108	0.442	0,000

Table 2 shows the variable career ladder had a p-value of = 0.000. It means there was a significant relationship (p-value < 0.01) between career ladder and nurses' job satisfaction with the strength of the relationship is positive.

Table 1. Distribution of Nurses by Age, Gender, Education, Period of Work and Career Level (n = 108)

Characteristics	n	%
Gender		
Male	23	21.3
Female	85	78.7
Education		
Associate degree (Diploma program)	24	22.2
Bachelors of Nursing	80	74.1
Masters of Nursing	4	3.7
Level of Clinical Ladder		
Pre-Nurse Clinicians Level	15	13.9
Nurse Clinicians Level I	60	55.6
Nurse Clinicians Level II	33	30.6
	Mean (SD)	Minimum-Maximum
Age	28.06 (2.39)	20-40
Period of work	3.96 (1.27)	2-7

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The career ladder aimed to advance nursing career in stages by fulfilling the requirements such as level of education and period of work and to develop nursing professionalism (Indonesian Ministry of Health, 2013). Career development supports excellent nursing performance by rewarding nurse clinicians who can fulfill the requirements (Adeniran, Bhattacharya and Adeniran, 2012). Besides, it also concerns about professional development (Chen *et al.*, 2010). Nurse leaders used career ladder system in facilitating the development of nursing professionals (TØrstad and BjØrk, 2007). In this case, they act as facilitators that develop evidence-based knowledge and skills. Professional clinical nursing development becomes a way to provide high quality of nursing services. Professional development is expected to embed critical thinking skills and increase nurses' job satisfaction (Winslow *et al.*, 2011). In regards to increase nurses' job satisfaction, the career ladder system can be the option.

Along with the development of science and technology in which patients' needs and request might vary, nurses need to improve and renew their competencies, and thus career ladder contributes to professional development (Hariyati and Safril, 2018). For improving nurses' clinical competence based on the career levels, hospital management provides Pre Nurse Clinicians Level a-year internship. After that, they submit an application for competency assessment as Nurse Clinicians Level I.

The hospital management could develop nurses' professionalism based on the clinical levels (Shermont, Krepcio and Murphy, 2009). The Nurse Clinicians Level I will receive different training program program from Nurse Clinicians Level II for different clinical authority, roles and responsibilities of each clinic level. Moreover, training programs which could be formal and educational programs on intensive care, haemodialysis and chemotherapy depend on the clinical authority in the practice areas.

Most of the nurses stated that the implementation of career ladder went well because nurses had high opportunities to increase their professionalism. What goes beyond this situation was that nurses understood the importance of professional development to improve competence. In this case, the career path is known as continous professional development (Hariyati *et al.*, 2017). Similarly, hospital management facilitated competency improvement programs, such as formal education, training and seminars.

Nurses' satisfaction with career ladder was indicated from nurses' interactive capability with colleagues and others in the organization as a major factor of career advancement (Sheikhi *et al.*, 2016). Nurses also had satisfaction when interacting with colleagues and the head of the room who always provided direction and guidance that make work easy and enjoyable. Nurses can improve their competence through mentoring as part of career ladder activities.

Nursing leadership dedication to implement consistent career ladder not only enriches nurse's productivity, but also reduces absenteeism and employee turnover (Moore, Meucci and McGrath, 2019). Therefore, the management especially nursing management supports the implementation of career ladder to increase nurses' productivity and reduce turnover.

A career ladder program also gives nurses the opportunity to reach the position of being a nurse manager, nurse educator and nurse researcher from the clinical level pathway as a promotion system. Ko and Yu (2014) stated that career ladder can improve the position of nurses by increasing their status in the leadership and management system. It has a significant function for succeeding to achieve pathways to nursing leadership positions (Drenkard and Swartwout, 2005). Opportunities to get promotion can increase employees' job satisfaction too (Suroso, 2011; Lorber and Savič, 2012). This is the reason why the nurses' job satisfaction with career ladder was quite high because promotion opportunities for nurses were wide open through the career stages they followed and fulfilled their requirements.

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The promotion system in career ladder begins from Nurse Clinicians Level II. The Nurse Clinicians Level II can be promoted to be Nurse Managers Level I respectively if fulfilling the requirements. The Nurse Managers Level I reaches to Nurse Managers Level II will be promoted as Nurse Managers Level II if fulfilling the requirements. The Nurse Clinicians Level III will be promoted as Nurse Educators Level I if they have completed the requirements. Nurse clinicians who want to become nurse researchers must pass Nurse Clinicians Level V (Swansburg and Swansburg, 2000; Indonesian Ministry of Health, 2006).

Shermont, Krepcio and Murphy (2009) stated that career ladder programs benefit nurses to increase clinical levels and positions in leadership as nurse managers. Hospital management, especially nursing management, need to to promote the career development at Nurse Manager Level I to Level V. The Nurse Clinicians Level II can also occupies the position of head of the room (nurse manager) and is placed in the management section.

Most of the nurses felt satisfied because career ladder provides equal opportunities in promoting the job positions if they fulfilled the requirements. Equality through career promotion can enhance nurses' skills and talents, as well as in turn the efficacy, effectiveness and quality of care (Kumar, 2016). Therefore, professional empowerment is very important to support the career development.

The development of career level depends on nurses' work experience. The average nurses' work period was 2-7 years, and thus the opportunity to develop the career level was quite large. Nurses who have worked for 3 years and above with professional nursing education registered and fulfilled the requirements can be promoted to Nurse Clinicians Level II as long as they have a high level of competence. It indicated that nurses with clinical experience of 2 years or less showed a low level of nursing competency (Kim and Kim, 2015).

Nurses who have clinical experience of 2 years and below are pre- Nurse Clinicians as or beginner nurses who and must have to pass an a-year internship. For 1 year who will After carrying out nursing practices based on clinical authority in the internship, they will to be assessed later as CN Nurse Clinicians Level I (Indonesian Ministry of Health, 2013). The Nurse Clinicians Level II who have worked for 3 years and more can be promoted to nurse managers. In other words, experience is the key to career advancement, management improvement, and mastery in clinical skills (Sheikhi *et al.*, 2016).

Adeniran *et al.* (2013) revealed that promotion in formal career ladder offers additional incentives in salary increase and seniority. In other words, seniority is also a factor affecting promotion in the career ladder program. The longer a nurse works, the higher the nurse's clinical level is. Likewise, increased incentives is the reason for reducing the number of nurse turnovers. Lack of opportunities for promotion may cause nurses leave It is concluded that career ladder affects nurses' desire to keep working at their institutions.

Similarly, Liu *et al.* (2012) explained that the implementation of career ladder is related to not only salary but also job satisfaction to retain nurses. Nurses' competence becomes a challenge in providing nursing care. Bjørk *et al.*, (2007) found nurses showed an increase in competence and applied skills when there is a career development. The performance characteristics of nurses at different levels were seen in skills acquired by nurses (Benner, 1982). Increasing competence for providing a good quality of nursing services through career ladder allows nurses to obtain opportunities for ongoing professional development. Therefore, an increase in nursing knowledge and skills, as well as empowering capacity could improve the quality of patient care based on the best scientific evidence (Burket *et al.*, 2010). Besides, continuous education and professional development programs support to enhance individual abilities based on the clinical nursing authority (Oyetunde and Oluwafunke, 2015).

Research by Weng *et al.*, (2015) discovered that there were significant

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discrepancies between advanced (e.g Nurse Clinicians Level I) and pre-intermediate nurses (Pre Nurse Clinicians) in the implementation of evidence-based practice. Nurses' clinical competencies are vital in implementing career ladder to provide a good quality of nursing care. Supporting nurses' competence can be done by placing nurses and restructuring the system based on their competencies (Kim and Kim, 2015). Opportunities for further education and career development for nurses may support nurses' competence (Hinno, Partanen and Vehviläinen-Julkunen, 2011). Higher clinical authority as a result of career development in specific areas of nursing practice enthuses nurses to carry out tasks and responsibilities.

With increased competence in the career ladder systems, nurses can receive rewards and recognition from health professionals like physician, pharmacist, laboratory assistant, and the other and patients since they become providers of nursing care to clients (Benner, 1982). Rewards and recognition for the clinical level achieved indicate an increase in nurses' clinical skills and experience (Duffield *et al.*, 2014). Rewards are given to nurses based on their clinical level responsibilities, experience and performance. The career ladder program is one of the approaches to reduce nurse turnover through recognition and appreciation (Allen, Fiorini and Dickey, 2010). Research by Kwak *et al.* (2010) also stated that career ladder becomes a recognition and appreciation for nurses' clinical expertise in providing patient care, and it can increase nurses' job satisfaction.

Rewards for increasing nurses' clinical level is performed by giving professional development programs to nurses. To improve the clinical level, nurses have to have higher education. For example, Nurse Clinicians Level I with bachelor's degree need to pursue graduate education. Hospital management has provided an opportunity for the nurses to pursue masters of nursing. This can be seen from some nurses who have a master's degree (see Table 1). According to Dill, Chuang and Morgan (2014), the hospital management's support is required to implement career ladder.

Rewards for improving nurses' career can be in the form of higher income/incentives (Swansburg and Swansburg, 2000). Nurses felt less satisfied with income/incentives since they thought that their roles were less properly valued (Masum *et al.*, 2016). The results of this study indicated that there was a significant relationship between rewards and job satisfaction (p-value = 0.00) (see Table 2). The increase in income/ incentives follows the nurse' clinical levels. In other words, Nurse Clinicians Level I will get different income/incentives from Nurse Clinicians Level II. Meanwhile, Nurse Clinicians Level I and II have different amounts of incentive from nurses working in the care rooms. This is due to the clinical authority in the specific practice areas which run particular treatments (Indonesian Ministry of Health, 2013). The Nurse Clinicians Level I and II in the chemotherapy, haemodialysis and intensive care rooms receive different incentives from Nurse Clinicians I and Nurse Clinicians in the treatment room. Such differences of incentives affect nurses' job satisfaction according to their areas of practice and clinical authority.

Robbins and Judge (2013) revealed that recognition gives nurses chances to participate in the decision making process and authority and nurses' autonomy improvement. Fusilero *et al.*, (2008) also revealed that decision making and professional autonomy were closely related to an increase in the career level of nurses. The Nurse Clinicians I and Nurse Clinicians II have the authority to provide nursing care to patients and get involved in decision making with critical thinking skills. However, it should be noted critical thinking skills of nurses are related to nurse competence. The Nurse Clinicians II will have critical thinking skills along with increasing competence. A study conducted by Chang *et al.* (2011) pointed out that nurses' critical thinking skills got better when nurses had high levels of education and enough work experience.

A career ladder program provides opportunities to gain knowledge and skills, and thus nurses' expertise can be

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collaborated with other professions' expertise (Korman and Eliades, 2010). The Nurse Clinicians Level I and II have the responsibility for providing and managing nursing care in accordance with the clinical authority and scientific evidence. When other health professionals ask patients' condition, the nurses can provide relevant information. In other words, nurses have carried out collaborative practices with other professionals through career ladder. It can be said that The Pre-Nurse Clinicians, Nurse Clinicians Level I and Nurse Clinicians Level II manage patients and make decisions related to patients' condition together with doctors.

However, there are still health professionals such as doctors who seem to have high status for their professions Research by Atefi *et al.*, (2014) stated that doctors overlooked nurses' clinical skills. This is due to an unrealistic superiority between doctors and nurses who always rely on doctor's instructions. Therefore, a career ladder system can facilitate nurses to improve their clinical skills and provide nursing care properly in accordance with the clinical authority. In turn, other professionals can recognize their skills as well (Bjørk, Samdal, *et al.*, 2007).

CONCLUSION

A good implementation of career ladder can encourage nurses to participate. Through career ladder, nurses can continue improving their career up to the highest level. Nurses work not only at the clinical level but also in the position of being a manager. The support of the heads of the rooms was required because the competency assessment could raise the nurses' clinical level. Speaking about education, higher education can accommodate nurses to have better competence. The amount of incentives given were in accordance with their clinical levels. There is recognition from other health professions as an impact of increasing skills through career ladder. Knowing that, the nurses felt satisfied with of the career ladder.

The hospital management support was also expected to concern about the nurses clinical skills and competencies through career ladder. They could provide professional development programs and increase nurses welfare since nurses play a important role and responsibility for providing professional nursing services. When nurses are valued for their roles, they will be satisfied with their work. In other words, such rewards can make nurses clinical skills and competencies stand out in front of other health professionals.

The career ladder is associated with the role and support from nurse managers as a mentor and assessor in improving nurse competencies. The clinical authority will belong to the nurses according to their clinical levels after they passed the performance assessment. Therefore, nurse managers need to update knowledge and insights through trainings, and thus they can be assessors and mentors for nurses' work in accordance with the clinical authority.

CONFLICT OF INTEREST

There is no conflict of interest in this study.

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LITERATURE REVIEW

THE QUALITY OF TUBERCULOSIS SERVICES IN PATIENTS' PERSPECTIVES: A LITERATURE REVIEW

Kualitas Pelayanan Tuberkulosis dalam Perspektif Pasien: Tinjauan Pustaka

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ABSTRACT

Background: The assessment from the patient's perspective is the assurance of TB service' quality to achieve the "End TB" target. The information regarding TB services' quality assessment in the dimensions of QUOTE TB Light is not widely found.
Aims: The study aims to review TB services' quality from the patients' perspective in the 7 dimensions of QUOTE TB Light**.**
Methods: This literature review study searched from 3 databases, namely PubMed, Science-Direct, and Google Scholar since July - October 2020. The inclusion criteria were research on TB services quality, patients' perspective, and patient assessment of 7 dimenssion. Articles assessed the other health services' quality and published before January 2015 was excluded.
Results: A total of 7 from 89 articles found were selected for review. The patients' assessments are based on their experiences or satisfactions. Most of the studies are satisfied with service availability, communication, patient-provider interactions, competence, and affordability. The patients' dissatisfactions about infrastructure and stigma acquired during treatment.
Conclusion: Infrastructure and stigma are assessed negatively. The continously evaluation and training for health workers need to be improved so they can serve patients well. The patients' perspectives can be the major consideration for providers to enhance the TB services' quality.

Keywords: Quality of TB services, QUOTE TB Light, patients' perspectives, Tuberculosis

ABSTRAK

Latar Belakang: *Penilaian dari perspektif pasien adalah jaminan kualitas pelayanan untuk mencapai target "End TB". Informasi dan penelitian mengenai penilaian kualitas pelayanan TB dengan QUOTE TB Light tidak banyak ditemukan.*
Tujuan: *Tujuan penelitian ini untuk mengulas tentang kualitas pelayanan TB dari perspektif pasien dalam 7 dimensi QUOTE TB Light.*
Metode: *Penelitian literature review ini mencari artikel-artikel dari 3 database, yakni PubMed, ScienceDirect, and Google Scholar sejak bulan Juli – Oktober 2020. Kriteria artikel meliputi penelitian kualitas pelayanan TB, kepuasan/pengalaman pasien tentang pelayanan TB, penilaian pasien terhadap 7 dimensi QUOTE TB Light. Penelitian yang menilai kualitas pelayanan kesehatan lainnya dan terpublikasi sebelum Januari 2015 diekslusi.*
Hasil: *Sebanyak 7 artikel dari 89 artikel yang ditemukan terpilih sesuai kriteria. Penilaian pasien berdasarkan pada pengalaman dan kepuasan mereka selama pengobatan. Sebagian besar penelitian puas dengan ketersediaan pelayanan, komunikasi informasi, interaksi pasien-petugas, kompetensi, seta keterjangkauan pelayanan. Ketidakpuasan pasien terjadi pada infrastruktur dan stigma yang diterima selama pengobatan.*
Kesimpulan: *Infrastruktur dan stigma adalah dimensi yang dinilai negatif. Evaluasi rutin dan pelatihan terhadap petugas kesehatan perlu ditingkatkan agar petugas mampu melayani pasien dengan baik. Perspektif pasien dapat menjadi pertimbangan utama penyedia untuk meningkatkan kualitas pelayanan dalam pengendalian TB.*

Kata kunci*: QUOTE TB Light, Kualitas Pelayanan TB, Perspektif pasien, Tuberkulosis*

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INTRODUCTION

Tuberculosis (TB) is still a public health problem that is the leading cause of illness and the top 10 causes of death globally (WHO, 2020). According to World Health Organization (2020), there are 10 million people infected TB and 1.2 million deaths in the world in 2019. Based on the Global Tuberculosis Report 2020, in 2015-2019 there has been a decrease in new TB cases by 9% (142 to 130 cases per 100,000 population), but this decrease in TB cases is not on track with the 2020 target, namely a 20% reduction in cases globally. India (26%), Indonesia (8.5%), and China (8.4%) are the three countries with the highest TB cases in the world (WHO, 2020).

The high number of TB cases globally is a driving force for TB control efforts. Since 2014, WHO has initiated a new strategy that accompanies the SDGs, namely the “End TB Strategy”. This strategy focuses on achieving coverage of TB services and treatment in all regions of a country (WHO, 2015). Many countries have increased this coverage, but the quality of service has received little attention. This condition causes many TB cases in the world (Cazabon *et al.*, 2017). To achieve the focus of "End TB Strategy", it is necessary to increase access to TB services and ensure that patients receive a sufficiently high level of TB care (Scott and Jha, 2014; Kruk, Larson and Twum-Danso, 2016; Cazabon *et al.*, 2017).

Patients are users of a health service, where patient-centered services can ensure that a health service is considered to be of good quality (Syachroni, 2018). Involving patients by considering their perspectives or views on the quality of TB services will be able to determine the patient's needs in treatment so that minimizing the occurrence of dropouts in treatment (Dirjen P2&PL Kementerian Kesehatan RI, 2011). Moreover, TB treatment which is included in the category of long-term treatment (at least 6 months) is prone to dropout from treatment. Patients who are satisfied with the services they received will be able to carry out regular treatment, maintain contact with health workers, comply with medical advice, and regularly use medical services (Rahmadiana, 2012; Menawati and Kurniawan, 2015; Bhatnagar, 2019)

The assessment of TB services' quality from the patient's perspective can be known from patients' satisfaction and experiences during treatment (Bhatnagar, 2019). There was a TB services wuality assessment tool developed by USAID is called QUOTE TB Light (Quality of Care as seen through the Eyes of the Patient). This tool assessed TB service quality from 9 dimensions: information communication, professional competence, availability of TB services, affordability, patient-provider interaction and counseling, infrastructure, relationship with TB-HIV, support, and stigma (Massaut, Broek and Kwaak, 2009). Many countries with a high TB burden, namely Cambodia, Indonesia, Mozambique, Nigeria, and Zambia have conducted assessments with this tool (USAID and TB Care I, 2015). The trials in Indonesia proved a need for improvement in quality of interaction between patients-providers and professional competence (Kemenkes RI, 2014).

Other studies in Indonesia assessed that 2 dimenssions, relationship between TB-HIV and support (food, transportation and money) were deemed necessary for improvement (Farsida, Mahendradhata and Probandari, 2012). Two of the nine dimensions of QUOTE TB Light have been assessed in previous trials in Indonesia and those proved a need for improvement. The other seven dimensions need to be reviewed to provide references in quality improvement. Besides, to the best of our knowledge, no literature reviews that

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discuss the TB service quality assessments in the QUOTE TB Light dimenssions. So, the aim of this study is to review the TB services quality as assessed from the patient's perspective in the 7 dimessions of QUOTE TB Light.

ANALYSIS AND DISCUSSION

This literature review research started from searching of scientific articles or research results on 3 databases, namely PubMed, ScienceDirect, and Google Scholar from July – October 2020. The terms or keywords in this search used Indonesian or English, including Tuberculosis *(Tuberkulosis),* quality of TB care or treatment *(kualitas pelayanan TB)*, QUOTE TB Light, patient perspectives, experiences, or satisfaction with TB services *(perspektif, pengalaman, dan kepuasan pasien terhadap pelayanan TB)*. Inclusion criteria used to select articles include: (1) research on the quality of TB services (2) satisfaction or experience in the patient's perspective of TB services, (3) patient assessment of one or more than 7 dimensions of TB service quality in QUOTE TB Light. While exclusion criteria were (1) duplicated article, (2) assessment of service quality in TB co-infection (such as TB-HIV, TB-DM, etc) or others, and (3) providers' or health workers' perspective, and (4) the articles published before January 2000 - 2015. We tried to review the latest studies to find out the current development of TB service quality, especially since 2015 WHO has focused more on TB services in TB control efforts that were initiated in the "End TB Strategy". Therefore, the articles that we screened were articles published in the last 5 years or before January 2015.

A total of 89 articles were identified by searching with these keywords in 3 databases. Furthermore, we removed 6 duplicated articles. There were 83 articles that are potential to be screened, starting from the abstract to the full-text articles. From the 83 potential articles, seventy-six (76) were excluded because they did not meet the inclusion criteria. Fifty-eight (58) articles were found discussing about assessment of TB service quality, so 25 articles were excluded from this review. Thirty-one (31) articles were fulfilling inclusion criterion 1, 2, and 3. However, twenty-four (24) of thirty-one (31) articles published before January 2000 - 2015.

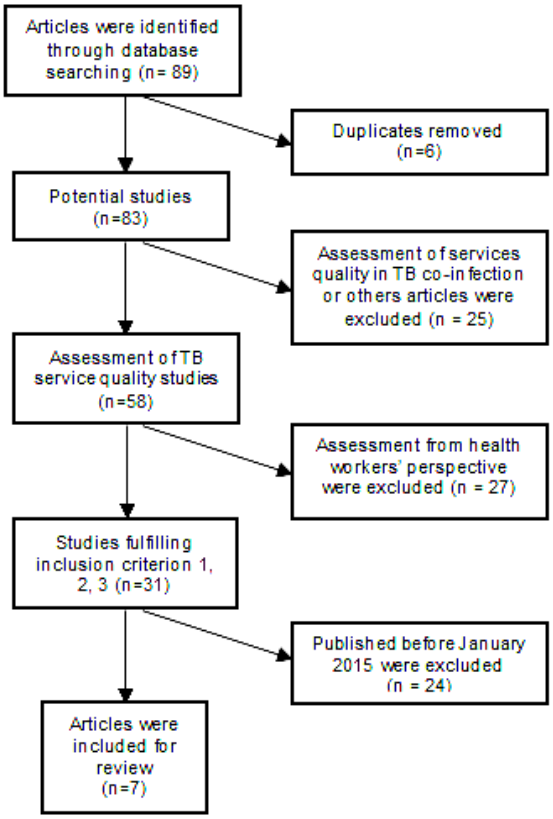

Figure 1. PRISMA diagram

As a result, the total number of articles that were included for review were 7 full-text articles. The flow chart for selecting articles is presented in Figure 1.

Characteristics of the selected articles

A total of 89 articles found in 3 journals search databases, seven (7) articles were selected to review. The table

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1 presents the characteristics of the 7 selected articles.

Three of seven articles (42.8%) used analytic cross-sectional, others used descriptive cross-sectional (3; 42.8%) and mixed-method designs (1; 15.4%). The several studies conducted quality assessments at primary health facilities, health centers, and even hospitals. However, two studies did not mention the type of health facilities (2; 28.6%). The study areas or countries were generally located in developing countries with the world's highest TB burden. The countries

Tabel 1. Characteristics of the selected articles

Studies	Study Design	Types of Health Facilities	City/District, Country	Samples	Patient Categories
Mukasa, Glass, and Mnatzaganian, 2015, Ethnicity and patient satisfaction with tuberculosis care: A cross-sectional study	Descriptive Cross-sectional	Hospital	Melbourne, Australia and Malawi, sub-Saharan Africa	194	Pulmonary TB treatment period
Onyeonoro et al., 2015, Evaluation of Patient Satisfaction with Tuberculosis Services in Southern Nigeria	Cross-sectional	Tertiary, secondary health facilities, and PHCs	Six states of Southern Nigeria	378	Pulmonary TB treatment period
Ssengooba et al., 2016, Patient satisfaction with TB care clinical consultations in Kampala: A cross sectional study	Descriptive Cross-sectional	PHCs	Kampala, Uganda	178	Pulmonary TB treatment period
Kurniawan, Andrajati and Supardi, 2017, *Perbandingan Kualitas Pelayanan Puskesmas Kecamatan Koja dan Tarumajaya terhadap Kepatuhan Minum Obat Pasien Tuberkulosis*	Descriptive Cross-sectional	PHCs	North Jakarta and Bekasi, Indonesia	322	Pulmonary TB treatment period
Bucyibaruta et al., 2018, Patients' perspectives of acceptability of ART, TB and	Mixed methods	TB health services*	Johannesburg, South Africa	297	Pulmonary TB treatment period

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maternal health services in a subdistrict of Johannesburg, South Africa					
Davtyan et al., 2019, Quality of care provided to tuberculosis patients in Armenia: How satisfied are the patients?	Cross-sectional	Primary health facilities	Armenia	505	Pulmonary TB treatment period
Peresu et al., 2020, Patient satisfaction with directly observed treatment and multidrug-resistant tuberculosis injection administration by lay health workers in rural Eswatini	Cross-sectional	MDR-TB health facilities*	Shiselweni, Eswatini	78	MDR-TB treatment period

**not mentioned.*
PHC = Public Health Centers

in Africa's continent were mostly found in this study (5; 71.4%), others in Indonesia, Armenia, and Australia. Most (6; 85.7%) articles chose Pulmonary TB patients during the treatment period as samples. Only one used MDR-TB patient category.

Tuberculosis service quality based on QUOTE TB Light

The review of the 7 research articles in Table 2, identified findings regarding assessing TB care quality from patients' perspective. This discussion, patients' assessment of TB services' quality is influenced by satisfaction and experience during treatment at a health facility. The patient's satisfaction was found in the 7 dimensions of QUOTE TB Light, shown at table 2. The existence of an assessment of the aspects in these dimensions can be used as determinant in improving the quality of TB services (Bhatnagar, 2019).

Availability of TB Services

Two of the seven studies provided a good assessment of service access in the dimension of TB service availability (Onyeonoro *et al.*, 2015; Kurniawan, Andrajati and Supardi, 2017). The patients felt no problem with access to TB services at the health facilities. The patients in Southern Nigeria's public health services were satisfied with access to affordable TB services. This satisfaction was associated with the increase in DOTS closer to the community in recent years (Onyeonoro *et al.*, 2015). Similiarly, research conducted in Indonesia which proves that the reach of the PHC's distance from the patient's residence affects the patient's adherence to treatment. The affordability of the PHC by patients will make it easier for them to carry out treatment. Patients do not feel lazy to routinely carry out treatment because they do not feel the need to pay for accommodation, time is wasted a lot on travel, and energy (Kurniawan, Andrajati and Supardi, 2017).

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Table 2. The main findings on patient experience of TB service quality

Dimension	Key findings

Availability of TB services	• Access to services is considered good by patients.
	  ○ Access to health facilities is affordable for patients in SN (Onyeonoro *et al.*, 2015).
	  ○ The location of PHC that is easily accessible has a big influence on the level of patient medication adherence (Kurniawan, Andrajati and Supardi, 2017).
	• Patients are uncomfortable with long waiting times when making doctor appointments and queuing for services (Ssengooba *et al.*, 2016).

Communication and Information	• Health education in private health facilities received by patients is considered unsatisfactory (Onyeonoro *et al.*, 2015). • Health workers' explanation about what has been done to patients is considered very good (Ssengooba *et al.*, 2016).
Patient-Provider Interaction and Counseling	• Ethnic Australians in developing countries tend to be dissatisfied with the unsatisfactory time of counseling with nurses (Mukasa, Glass and Mnatzaganian, 2015) • Patients are satisfied with the counseling service because of the certainty and clearer understanding of the disease they are suffering from. The relationship between patients and staff is more intense and increased (Onyeonoro *et al.*, 2015). • Sufficient time for discussion is a major factor in high patient satisfaction (Ssengooba *et al.*, 2016). • The patient accepts the counseling carried out with satisfaction because of the staff's good empathy towards the patient (Davtyan *et al.*, 2019).
Affordability	• Even though MDR-TB treatment costs are free, patients face other charges (food, transport, loss of job), affecting patient satisfaction with services. (Peresu *et al.*, 2020).
Infrastructure	• Patients are not comfortable with service facilities, namely insufficient and adequate seating at Tarumajaya PHC, Indonesia (Kurniawan, Andrajati and Supardi, 2017). • There are infrastructure constraints that force counselors to provide confidential information such as HIV status to other patients (Bucyibaruta *et al.*, 2018).
Professional competence	• Expertise (accuracy, thoroughness, carefulness, competence) of health workers is an important factor in high patient satisfaction (Ssengooba *et al.*, 2016).

Stigma in TB services	• Most of the patients experienced bad treatment by the attitudes and behavior of health workers(Onyeonoro *et al.*, 2015)
	  ○ Most of the patients experienced bad treatment by the attitudes and behavior of health workers (Onyeonoro *et al.*, 2015)
	  ○ Some officers ask for money for TB services that should be free (Onyeonoro *et al.*, 2015)
	  ○ The attitude of politeness, respect, sensitivity, and friendliness of officers is considered good by the patient (Mukasa, Glass and Mnatzaganian, 2015; Ssengooba *et al.*, 2016).
	  ○ Nurses are rude and have negative behavior, which is indicated to be one reason for some patients to drop out of treatment (Bucyibaruta *et al.*, 2018).

SN = South Nigeria, PHC = Public Health Center

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This finding is supported by research conducted in Nepal, India, with the world's highest burden. Research on barriers to access the health services in Nepal, India found that there are causes of barriers to health services due to long distances, poor road conditions, and costs for long trips that must be taken, which encourages people to visit more traditional healers than health services. These barriers to health care in Nepal, India affected adherence and patient delay in treatment (Marahatta *et al.*, 2020). The delay in treatment impacted the disease's severity and spread, which is increasingly widespread to family members and communities (Saifodine *et al.*, 2013; Makwakwa *et al.*, 2014).

In the QUOTE TB Light assessment, availability of TB services include the affordability of service access distances and consists of the waiting time for TB services (Massaut, Broek and Kwaak, 2009). As reported in the selected article, the long waiting time when making a doctor's appointment caused patients to be uncomfortable with services' availability (Ssengooba *et al.*, 2016). Not only when making appointments, but patients also experienced long waiting times while in TB services when queuing for treatment (Ssengooba *et al.*, 2016). This finding contrasts with the conclusions of another study in India, where patients were satisfied with the waiting time to get medical services with a short waiting duration at health facilities in Masya Pradesh and Kamataka City (Rashmi and Vijaykumar, 2010; Rai *et al.*, 2017). The availability of services is one indicator of the minimum service standards for a health facility. One of the factors affecting patient compliance in taking medication is the availability of services.(Dwi Laksono *et al.*, 2012).

Communication and Information

Other dimensions found to be important in assessing service quality included communication and information. In QUOTE TB Light, the assessed aspects are communication and information, namely information that is explained accurately and correctly to patients regarding the disease, treatment, examinations, and prevention of TB transmission to patients. Onyeonoro et.al (2015) study in Six states of Southern Nigeria found that the dissatisfaction received by patients regarding TB health education in private health facilities (Onyeonoro *et al.*, 2015). In contrast, another selected article found that patients rated the staff's information very well. Patients said the officers explained well what had been done to patients during the TB treatment period (Ssengooba *et al.*, 2016).

Health communication carried out by officers properly will also create a good impression for patients, and vice versa The delivery of accurate, correct, and clear information will influence the patient to comply with the treatment as expected by the officer (Notoatmodjo, 2005; Rahmadiana, 2012; Bhatnagar, 2019). Besides, communication will also increase the patient's knowledge of the disease and the medication carried out so that the patient's quality of life will often improve with patient compliance and awareness in treatment due to the correct information from the staff (Notoatmodjo, 2005).

Patient-Provider Interaction and Counseling

Good patient-provider interactions must also accompany the existence of good communication and information. Table 2 shows that most of the research results convey patient satisfaction with the interaction and counseling received. Sufficient discussion time is a major factor of high patient satisfaction with the TB

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services they receive (Mukasa, Glass and Mnatzaganian, 2015; Ssengooba *et al.*, 2016). Counseling carried out with officers is well established because the officers' empathy is well-received (Davtyan *et al.*, 2019). As with the communication dimension, the effectiveness of patient-officer interactions will impact patient treatment outcomes by the staff's suggestions and expectations and increase medication adherence (Menawati and Kurniawan, 2015). It is because sometimes patients also want to take part in their treatment decisions, to be able to talk, discuss problems they are experiencing, and want to be heard.

Patient and provider interactions can also occur because of counseling. Counseling is a process of assisting clients, in this case, TB patients, to resolve their problems (Gunarsa, 2007). Counseling in TB treatment is important to control and monitor TB patients during the following treatment. The previous findings indicate a significant relationship between counseling and compliance with TB patients while taking drugs (Hussain, A. Malik and Hussain, 2016; Aldina, Hermanto and Manggasa, 2020). There were 62.5% of TB patients who were not adherent in taking drugs without good counseling (Aldina, Hermanto and Manggasa, 2020). Providing information about TB and its treatment is equally important in counseling. Tuberculosis treatment that takes a long time and requires extra adherence causes the need for information on TB treatment, prevention, health implications, and the family's role in recovery in patients is very high (Pasek, Suryani and Murdani, 2013).

Affordability

The dimension of affordability is also the main thing for patients in assessing the quality of TB services. Although all TB patients can currently afford the cost of access to services due to free TB treatment, patients do not necessarily feel that the fees do not burden them. During treatment, patients also consider other costs that they must pay, such as transportation costs, meals, cost of work left to take medicines at health facilities, and the reduced income due to some of them having to stop working due to TB. This condition will cause patient to fell dissatisfied with TB services quality (Peresu *et al.*, 2020). If the patient feels burdened by these costs, it will contribute to the failure of TB treatment (Long *et al.*, 2011), which will lead to an increase in household transmission to death (Xu *et al.*, 2010).

Catastrophic costs of TB are all total costs that must be incurred by patients and their families, including direct and indirect costs (WHO, 2017). Direct cost of treatment includes administrative, consultation, laboratory, drug, and hidden costs. Indirect costs include transportation costs, loss of work and income, and basic needs (Sari *et al.*, 2017). Tuberculosis patients generally feel burdened by indirect costs because the government do not cover them. Research in Indonesia reported the incidence of disaster costs in households in 282 TB patients was 38%. and patients needed financial support primarily to cover indirect costs, such as loss of jobs, transportation, and food supplements (Fuady *et al.*, 2019). It can prove that even though programs in TB control provide free treatment to patients, patients are burdened by costs outside of TB treatment.

Professional Competence

The professional competencies are the skills, expertise, and abilities of health workers in performing service standards, including patient examination, treatment assistance, and all matters relating to providing services to patients (Bustami, 2011). It is proven in a study in Kampala, Uganda, that professional competence is

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an important factor in high patient satisfaction. Patients feel satisfied with the expertise that includes thoroughness, carefulness, and competence of health workers they saw and accepted during treatment in health center, Kampala, Uganda (Ssengooba *et al.*, 2016). The research conducted in Ethiopia revealed that officers' professional service provision was a predictor factor for patient satisfaction in carrying out treatment. This study proven that satisfaction with the services received will affect compliance with the staff's suggestions until the treatment's success (Nezenega, Gacho and Tafere, 2013).

The professional competence also includes competent care, which is the provision of care and management for all TB patients must comply with the most recent evidence-based guidelines that have been determined, including diagnostic accuracy (Arsenault, Roder-DeWan and Kruk, 2019). Many health care providers in high burden countries for TB do not comply with International Standard TB care guidelines. It has been reported in several studies with the standard patient method (Das *et al.*, 2015; Daniels *et al.*, 2017).

Infrastructure

The negative experiences received by patients in the study occurred in two main dimensions, including TB service infrastructure. Patients are dissatisfied with the infrastructure they had gotten during treatment. One of Indonesia's research was that the facilities at the Tarumajaya PHC, Indonesia, which was not adequate. The patients were uncomfortable with seats in these health facilities, where often they did not get a seat when queuing up, so they have to stand for some time (Kurniawan, Andrajati and Supardi, 2017). Likewise, another study in TB health service in a subdistrict Johannesburg, Souht Arica revealed that there were frequent infrastructure constraints and made patients uncomfortable during counseling. A patient even described infrastructure constraints forcing the counselor to give confidential information to other patients (Bucyibaruta *et al.*, 2018).

The comfort, availability, and cleanliness of existing health services facilities can be predictor factors for patient satisfaction in carrying out treatment (Nezenega, Gacho and Tafere, 2013). In Ethiopia, there are intrinsic differences in the types of health facilities, such as inherent differences and infrastructure conditions between primary and tertiary hospitals affected the low level of patient satisfaction with the cleanliness of waiting room facilities in health facilities (Mesfin and Gintamo, 2019). Besides, in efforts to control TB in Brazil, the infrastructure aspect was an important component that needs significant improvements to achieve maximum TB control (Bustami, 2011).

Stigma in TB services

The patient’s dissatisfaction also occurred in the aspect of stigma. In QUOTE TB Light, the focus of stigma is the treatment of the staff and patients' health system during treatment. Most of the studies found patient dissatisfaction with health workers' attitudes and treatment towards them during treatment. Research in Southern Nigeria discovered that patients were dissatisfied with staff's attitude toward them. Patients regret the attitude of health workers who collect money during TB treatment which should be free. (Onyeonoro et al., 2015). A study by Bucyibaruta et. al. (2018) in the subdistrict of Johannesburg, South Arica also reported that there was stigma and mistreatment of health workers towards their patients. Some patients admit that the nurse was rude to them. This behavior led some patients to decided to stop TB treatment.

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Infectious diseases which are common especially in the middle-income countries are often considered a bad disease. Tuberculosis is one of infectious disease that has received much negative stigma in society. The negative stigma in TB patients is due to the fear of easily transmitted TB, loss of social status in the community, fear of social isolation, exclusion, gossip, failure of the marriage, neglect of families, and fear of sexual or verbal abuse (Mukerji and Turan, 2018; Thomas and Stephen, 2020). TB patients with HIV infection are more at risk of receiving negative stigma in society. It is possible because HIV has a high stigma, where people diagnosed with HIV are more often viewed negatively in society (Duko *et al.*, 2019).

Health workers are among those who play a role in TB control (Lestyoningrum *et al.*, 2020), especially the stigma that occurs in TB patients. Their role is expected to be able to encourage the patients to remain adherent to treatment during the negative stigma that patients receive. Hence, even health workers who are a milestone in TB control carry out this stigma. There is much negative stigma about TB patients being received from health care facilities. Unfavorable treatment, rude attitudes, rejection and differences in the standard of care provided are sometimes carried out by providers, health workers, and other patients (Mukasa, Glass and Mnatzaganian, 2015; Ssengooba *et al.*, 2016).

Stigma of TB is an important social determinant of health (Craig *et al.*, 2017). The occurrence of stigma will certainly affect the diagnosis, treatment, and treatment success of the patient. Patients will be reluctant to take medication and delay getting treatment (Cremers *et al.*, 2015) to cause distrust patients in health facilities. In TB control efforts, stigma must be eliminated, especially in health facilities, because it will impact increasing patient adherence to treat (Nyblade *et al.*, 2019).

Implications for Service Providers in Improving the Quality of TB Services

This review highlights the assessment of TB patients' perspectives on TB service quality based on the seven QUOTE TB Light dimensions. The findings of this review indicate that patients provided mixed ratings of TB services during treatment. The patients' assessment is based on the patient's experience and satisfaction in getting service during treatment. Besides, the evaluation of the quality of service received by patients greatly affects the patient's subsequent actions in therapy, one of which is to stop TB treatment prematurely. Thus, service providers need to consider the patient's assessment of the TB's treatment service quality to develop and improve the quality of TB health services.

We would like to highlight several key points in the results of this review that might be considered. First, the patient's decision to drop out of treatment is influenced by the patient's experience while receiving TB services in health facilities. It proves that service quality is one of the main keys to patient compliance in TB treatment, in which TB disease is an infectious disease with a long treatment time and treatment adherence is required to achieve a cure. Providers need to pay attention and consider TB patients' needs and desires in TB care. It is important to have a personal and strategic approach to the patient and the patient's family so that they feel included and listened to during treatment. Besides, the provider can do limited interviews routinely to involve patients in TB service quality improvement, using a quality assessment tool, namely QUOTE TB Light, with easy

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use by service providers and health practitioners.

Second, our review found that most of the articles discussed the negative stigma that patients received in the health facilities they visited. Different treatment with other patients, rude attitude, disrespect, and withdrawal of money outside of medical expenses are reported in several articles we reviewed. This condition will again impact patient adherence to treatment (Onyeonoro *et al.*, 2015; Ssengooba *et al.*, 2016; Bucyibaruta *et al.*, 2018). The stigma of TB does not only occur in the community, even health workers, which are a milestone in TB control, actually carry out this stigma. It should be a concern for service providers. Improving the quality of human resources needs to be done. Stopping stigma in health facilities can be done by evaluating performance and increasing training for health workers in health practices and morally, attitudes, and behavior.

Third, the assessment of service quality is measured based on patient perceptions is accepted as an important indicator in measuring the quality of service (Woodring *et al.*, 2004). Various countries use patient satisfaction survey results as the main criterion in quality assurance and management of the health system. However, there is no universally accepted way of measuring patient satisfaction with health services. Satisfaction is a multi-dimensional concept that allows for differences in measurement. In this review, various methods are used to report patient perceptions of service quality so that there is no consistent measurement tool in measuring patient satisfaction (Mesfin and Gintamo, 2019).

CONCLUSION

The assessment and negative experience which are received by patients about TB services are often the reason patients stop treatment. For health service providers and policy makers, quality improvement needs to be more focused on 1) involving patients in assessing the quality of services, 2) evaluating the quality of services that is carried out regularly and systematically, and 3) it is important to carry out regular training for health workers so that they can treat and take good care of patients and improve their competence.

Focusing on patient-centered services could support in identifying the real needs of the patient so that it is hoped that adherence to TB treatment will increase. Further research is needed in the application of QUOTE TB Light in TB service facilities to determine the current condition of TB services in Indonesia.

CONFLICT OF INTEREST

The author states that there is no conflict of interest in this study.

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COMMENTARY ARTICLE

DIRECTIVES ON COMMUNITY USE OF FACE MASKS DURING COVID-19 PANDEMIC: A COMMENTARY ARTICLE

Anjuran Pemakaian Masker Bagi Masyarakat Selama Pandemi Covid-19: Artikel Komentar

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ABSTRACT

Wearing a universal face mask is recommended by most health authorities during the COVID-19 pandemic. This commentary elaborates directives given in relation to the use of face masks and identify the underlying principles for public health recommendations by the government authorities of Australia, Canada, China, Hong Kong, Singapore, the United Kingdom and the United States of America. Key data were considered from official government websites by a team of healthcare management experts. It was argued that the directives recommended by the governments were based on the principles addressing the different facets of COVID-19 pandemic, population dynamics, resource availability and scarcity, and the fact that how the proposed standard of practices would be translated into compulsory obligations in the community. The principles involved regulations versus voluntary compliance of the population, transmission scenario, protection from sick or asymptomatic people, special needs and vulnerable groups, synergistic versus substitute/alternative, occupational health risk, adverse effects on usage, types of masks which depend on the risk or context, change in use practices depending on demand, scarcity and quality assurance. Recommendations of the use of face masks were found to be heterogeneous and apparently inconstant. Within the dynamic situation of the COVID-19 pandemic, the directives on community use of face masks were issued based on certain dominant principles and interplayed between principles that should be deeply explored by the healthcare decision makers.

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INTRODUCTION

Coronavirus (COVID-19) infection was first declared in Wuhan city, China, in December 2019 and became a public health issue drastically. The World Health Organization (WHO), on 30th January, 2020, declared COVID-19 as a Public Health Emergency of International Concern and subsequently as a pandemic on 11th March, 2020. At this juncture, many health officials recommended the community to wear face masks outside, especially where the virus transmission is high and wherever other social distancing measures are difficult to maintain (Zhou, 2020). Masks might help to reduce droplet transmission and risk of infection from symptomatic or asymptomatic patients. Awareness about transmission, gateways of exit and entry and methods of transmission provides a basis for planning appropriate control strategies at the spur of the pandemic (Centers for Disease Control and Prevention, 2012).

WHO recommend adhering to personal protective means such as hand hygiene, respiratory etiquette, social distancing, environmental and travel-related steps to decline and hinder transmission (World Health Organization, 2020c). The two main paths of

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transmission of the virus are through respiratory droplets and contact according to the current evidence (World Health Organization, 2020e). To minimize the respiratory means of transmission in the latter pandemic, WHO have recommended the use of face masks (World Health Organization, 2020h). In the implementation, different countries have recommended the use of face mask for their communities.

Masks can be categorized as medical/ surgical or non-medical/ community masks, and different types may offer different levels of protection (McMaster University- Health Forum, 2020). A medical face mask is a medical device capping the mouth, nose, and chin defending against the transmission of an infective agent amidst the hospital staff and patients. Non-medical face masks differ from the medical counterpart and include various forms, such as self-made or commercial masks or face covers made of cloth (European Centre for Disease Prevention and Control, 2020). However, even countries that have generally advised such masks for public use should be reserved for health workers or those, particularly at high risk. At this point, to make sure that adequate stocks are reserved and available for health care workers, many health authorities have compelled to recommend and promote community face masks instead of medical masks. However, it is paramount to ensure adequate supply to key workers first to prevent them from acquiring occupational respiratory diseases (World Health Organization, 2020f).

Since the commencement of the COVID-19 pandemic, panic about the use of face masks has become a universal issue in almost all over the world with limited or no evidence (Chan *et al.*, 2020). Different countries have included WHO adapted risk-based use of masks among key workers and the general public (World Economic Forum, 2020; World Health Organization, 2020g). Some countries did not advocate the use of surgical masks but urged to use simple cloth face covers, while many other countries made it obligatory to use face masks in public and inflicted fines for those who did not comply with the recommendation (Al Jazeera, 2020; Cheng, Lam and Leung, 2020; European Centre for Disease Prevention and Control, 2020; Feng *et al.*, 2020).

In the wake of countless days of social and economic quarantine, political leaders and people across the sphere need to re-emerge from COVID-19 driven lockdowns. Academia have to investigate evidence-based strategies to re-emerge from strict social mobilization. The use of community facemasks can be marked as one such major unresolved issue (Chan *et al.*, 2020; European Centre for Disease Prevention and Control, 2020; World Health Organization, 2020b).

In fact, social distancing measures such as lockdowns have been only slowing down the spread of the virus but have not been able to eradicate it. Shutting down of businesses and schools and giving stay-at-home instructions give time to the scientists and the academia to develop strategies to strike the virus. Different health authorities mainly recommend social distancing and hand hygiene as essential steps to prevent the spread of the virus in the absence of vaccines and drugs to fight or lessen the severity of the disease (World Health Organization, 2020d).

Several Asian countries perceiv a face mask as a supportive device (The Guardian, 2020b). They even banned people with no face masks or compulsory masks on the streets, especially on public transports and closed public places (Forbes, 2020; The Telegraph, 2020). On the other hand, Europe and other developed countries had different

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sentiments on the compulsory use of face masks (Harries, 2020). They believed masks should be set aside for health care workers, other key workers, and sick people to safeguard other people (Carver and Phillips, 2020; CDC, 2020b). Whether face masks helped in preventing the spread of coronavirus has been a dubious issue among health professionals, especially in need of active pharmacological treatment. There are few unresolved questions under review among many health authorities. The question is how useful community face masks and whether it will protect people and others from the virus (Feng *et al.*, 2020; Leung *et al.*, 2020; Mahase, 2020; World Health Organization, 2020a). Most authorities are afraid to recommend compulsory use of face masks also known as universal masking in the community because it can make the situation worse with false sense security if not used properly.

Evidence on accurate representation on the community use of face masks currently does not exist, or few trials have been conducted or in the pipeline during this COVID-19 pandemic. Nevertheless, the available evidence on the protective effect of face masks in community settings from other randomized trials for other respiratory diseases is also inconclusive. The use of face masks probably providea an insignificant added protective effect when used in combination with other public health measures in a situation where social distancing is not possible (European Centre for Disease Prevention and Control, 2020; Gov.UK Developer docs, 2020; The Guardian, 2020a).

Besides, a considerable controversy has been observed in the recommendations of face masks in different stages of the disease progression in some countries. The decision of policymaking in the health system is a difficult task (Dobrow, Goel and Upshur, 2004), especially a challenging activity in limited-resource settings. In the COVID 19 pandemic, the supply chain of Personal Protective Equipment (PPE) is not aligned with the overwhelming demand. Distorted supply of the PPE for healthcare settings contributes to increased risk of spreading infection among front line workers (Gooding, 2016). On the other hand, relaxing lockdown measures and continuing business activities and recommencing economic activities urge new alternative recommendations of preventing the virus transmission. At this critical point of decision-making processes, policymakers face increasing pressures to ensure effective policy recommendations while maintaining balance among key concerns of policymakers, opinions of consumers and professional bodies and evidence gained from research (Robinson, 1993).

Different principles have been considered by the government authorities in the use of face masks as a public health measure eventhough they haveseveral controversial and unclear states of thoughts. In this blurry situation, several principles are observed to make the background for government directives. The principles have played major role in the policy making process claiming for right decisions for each context. The principles include regulations versus voluntary compliance of the population, transmission scenario, protection from sick or asymptomatic people, special needs and vulnerable groups, synergistic versus substitution/alternative effects, occupational health risks, adverse effects on usage, types of mask depending on the risk or context, change in practices in use depending on demand and scarcity and quality of assurance.

This commentary is based on the directives on the use of face masks to the public as the respective governments of

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Australia, Canada, China, Hongkong, Singapore, the United Kingdom (UK) and the United States of America (USA) have issued during the COVID-19 pandemic. The directives are available online in their government official websites with .gov domains. The data were retrived between the period of 10th May, 2020 to 31st May, 2020. Above countries were selected based on the availability of comprehensive government websites and authors' familiarity. Also, the authors believed the same principles in other developing countries were based on the recommended directives on the use of face masks as the whole world have also been fighting the virus and facing a shortage of supplies in an equal manner. Further, the authors observed more confusion in the directives given due to socio-political reasons and freedom of communication. Thus, that made a great context exploring underlying causes.

DISCUSSION

The authors observed ten principles in which the directives on the use of face masks were issued by the governments to the community during the COVID-19 pandemic. The key directives and their identified broader themes are listed in Table 1.

Table 1: Directives given to the community by the respective government authorities concerning the use of face masks during the COVID-19 pandemic.

Websites and titles	Links	Results
The Singapore Government Agency Website- How to redeem the new reusable mask Safe Work Australia COVID-19 Information for office masks	https://www.gov.sg/article/when-should-i-wear-a-mask https://www.safeworkaustralia.gov.au/covid-19-information-workplaces/industry-information/office/masks	Regulations versus voluntary compliance of the population-Social freedom, political bureaucracy directly influenced the population compliance with the government regulations.
The Singapore Government Agency Website- How to redeem the new reusable mask Centers for disease control and prevention-Coronavirus disease 2019	https://www.gov.sg/article/when-should-i-wear-a-mask https://www.cdc.gov/	Transmission scenario – Severity of the spread of the disease within the country influenced the decision making of the face mask usage.
The Singapore Government Agency Website- How to redeem the new reusable mask Centers for disease control and prevention-Coronavirus disease 2019 Safe Work Australia COVID-19 Information for workplaces Health Direct- Physical distancing and how to avoid the COVID-19 infection	https://www.gov.sg/article/when-should-i-wear-a-mask https://www.cdc.gov/ https://www.safeworkaustralia.gov.au/covid-19-information-workplaces/industry-information/office/masks https://www.healthdirect.gov.au/coronavirus-covid-19-how-to-avoid-infection-faqs	Protection from sick or asymptomatic- Health authorities issued directives for people to wear face masks to protect others and reduce droplet transmission.

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The State Council, Peoples Republic of China, China still encourages healthy people to wear face masks	http://english.www.gov.cn/statecouncil/ministries/202003/24/content_WS5e79ed1ec6d0c201c2cbf572.html	
The Singapore Government Agency Website- How to redeem the new reusable mask	https://www.gov.sg/article/when-should-i-wear-a-mask	Special need and vulnerable groups considered to prevent or reduce the high mortality rate among this high-risk group.
The Singapore Government Agency Website- How to redeem the new reusable mask	https://www.gov.sg/article/when-should-i-wear-a-mask	Synergistic versus substitute/alternative directives on the use of face masks were considered by all the governments
The Department of Health, Hong Kong- Guidelines on prevention of Coronavirus disease 2019 (COVID-19) for the general public.	https://www.chp.gov.hk/files/pdf/nid_guideline_general_public_en.pdf	
Centers for disease control and prevention-Coronavirus disease 2019	https://www.cdc.gov/	
The Australian Government Department of Health	https://www.health.gov.au/resources/publications/coronavirus-covid-19-information-on-the-use-of-surgical-masks	
The UK Government's COVID-19 recovery strategy, Our plan to rebuild	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/884760/Our_plan_to_rebuild_The_UK_Government_s_COVID-19_recovery_strategy.pdf	
The Singapore Government Agency Website- How to redeem the new reusable mask	https://www.gov.sg/article/when-should-i-wear-a-mask	Occupational health risks- Government considered the nature of the occupation, linked with the risk of infection. Risk of the adverse events using a face mask during work was also considered.
The Singapore Government Agency Website- Guidelines for employers on protecting employees from the effect of haze	https://www.mom.gov.sg/haze/guidelines-on-protecting-employees-from-haze	
Safe Work Australia COVID-19- Information for workplaces	https://www.safeworkaustralia.gov.au/covid-19-information-workplaces/industry-information/office/masks	
Department of Health Services, Hong Kong- Guidelines on prevention of coronavirus disease 2019 (covid-19) for the general public	https://www.chp.gov.hk/files/pdf/nid_guideline_general_public_en.pdf	Adverse effects on usage- Adverse effect on usage due to underlying medical status and vulnerable physiological status was considered when the governments gave

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Centers for disease control and prevention- Coronavirus disease 2019 The official website of the Government of Canada- Coronavirus disease (COVID-19)	https://www.cdc.gov/ https://www.canada.ca/en.html	directives on face mask usage.
Centers for disease control and prevention- Coronavirus disease 2019 The official website of the Government of Canada- Coronavirus disease (COVID-19),	https://www.cdc.gov/ https://www.canada.ca/en.html	Types of masks depending on the risk or context – Health authorities considered contextual factors which increased the risk of infection and used them to recommend types of face masks in the specific work environment.
Australian Government Department of Health Health Direct- Physical distancing and how to avoid the COVID-19 infection	https://www.health.gov.au/resources/publications/coronavirus-covid-19-information-on-the-use-of-surgical-masks https://www.healthdirect.gov.au/coronavirus-covid-19-how-to-avoid-infection-faqs	
National Health Commission of People's Republic of China- Tips for choosing and using masks to prevent novel coronavirus	http://en.nhc.gov.cn/2020-02/06/c_76398.htm	
The UK Government's COVID-19 recovery strategy, our plan to rebuild	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/884760/Our_plan_to_rebuild_The_UK_Government_s_COVID-19_recovery_strategy.pdf	
Ministry of Health Singapore- Continued stringent implementation and enforcement of circuit breaker measures	https://www.moh.gov.sg/news-highlights/details/continued-stringent-implementation-enforcement-of-circuit-breaker-measures	
Department of Health Services, Hong Kong- Guidelines on prevention of Coronavirus disease 2019 (COVID-19) for the general public	https://www.chp.gov.hk/files/pdf/nid_guideline_general_public_en.pdf	
The State Council, Peoples Republic of China- China still encourages healthy people to wear face masks	http://english.www.gov.cn/statecouncil/ministries/202003/24/content_WS5e79ed1ec6d0c201c2cbf572.html	
Safe Work Australia COVID-19 Information for workplaces	https://www.safeworkaustralia.gov.au/covid-19-information-	Changes in face mask usage practices depend on

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	workplaces/industry-information/office/masks	demand and scarcity.e.g. recommendation of masks that have passed shelf life and do not have any physical damages were recommended by the governments when there was a shortage.
Safe Work Australia COVID-19 Information for workplaces	https://www.safeworkaustralia.gov.au/covid-19-information-workplaces/industry-information/office/masks	Quality assurance- Defining the specifications for face masks, especially in high risk working environments.
Australian Government Department of Health- Therapeutic goods administration, advice on surgical masks and gowns during COVID-19.	https://www.tga.gov.au/advice-surgical-masks-and-gowns-during-covid-19	
National Medical Products Administration- Regulatory requirements and standards for Coronavirus reagent test kits and protective equipment in China.	http://english.nmpa.gov.cn/2020-03/30/c_467202.htm	

The recommendations of health authorities for the use of face masks showed significant differences. In the process of public health policy, scientific evidence primarily plays a key role. Besides, the context-specific principles such as economic status, attributes of demand and supplies, political willingness, level of population compliance with public health measures, health system infrastructure and social and cultural factors influence to shape up the final output. This commentary explains underlying principles influencing the formation of policy directives concerning the community use of face masks during the COVID 19 pandemic.

Regulations versus voluntary compliance

Law enforcement versus voluntary compliance as a principle to implement recommendations of the community use of face masks played differently in various settings. Countries such as Singapore which has strict bound public governance systems (Xinghui, 2020) apply a combined approach as risk communication and legislative fine in contrast to that of the UK. While Canada fully depends on voluntary public compliance based on risk communication strategies (Clark *et al.*, 2020). That indirectly implies social freedom, political bureaucracy, level of population compliance which directly influences decision making processes.

Transmission scenario

Early flexible directives given by the Singapore government changed according to the epidemiological transmission scenario (Government of Singapore, 2020). At the early stages of scenario, the directives were influenced by other principles. However, at the community transmission scenario and the stage in

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which the practice of rigid public health measures is difficult, the directives emphasizes on the community use of face masks (CDC, 2020a; Cheng, Lam and Leung, 2020). That indicates at the worst situations, scientific factors such as epidemiological transmission scenarios play a dominant role in a decision making process.

Protection from sick or asymptomatic people

Another underlying principle for the directives on the use of face masks is to protect people from sick or asymtomatic patients. Many health authorities have encouraged people to wear face masks to protect others as you can prevent droplet transmission (Government of Singapore, 2020). On the other hand, the use of face masks may reduce the transmission of the virus and protect people being infected by undetected cases. Importantly, this practice will be helpful if vulnerability to infection is high in situations with higher community transmission and less social distancing.

Unless you are suspected of being infected with COVID-19 or caring for a person who is confirmed or suspected, the use of surgical face masks is not recommended due to lack of evidence and sustainable supplies for key workers. In contrast to above, some countries have recommended universal face masking to prevent or reduce community transmission of COVID-19 (CDC, 2020c; The State Council, The People's Republic of China, 2020).

Special need and vulnerable groups

It is evident that immune deprivation or vulnerability to diseases is considered as an underlying principle for wearing face masks which protect people from being exposed to the virus (European Centre for Disease Prevention and Control, 2020). Furthermore, CDC and many health authorities recommendthe community, especially for vulnerable and elderly, to wear face masks on public transportation and where social distancing is not possible (CDC, 2020c).

Synergy versus substitution/alternative effects

Principally, the majority of health authorities emphasize the importance of synergistic effects of using face masks. The use of face masks was further mentioned as not an alternative/substitute to social distancing and other public health measures such as hand hygiene before wearing and after removing a mask (Public Health Agency of Canada, 2020). Authorities need to be causious when giving directives to the public on the use of face masks. Wearing face masks can give a 'false sense of security' over coronavirus unless they do not adhere to the basic public health principles (Australian Government Department of Health, 2020; CDC, 2020a; Centre for Health Protection, 2020; Government of Singapore, 2020).

Occupational health risks

Some countries have made recommendations not only for health care workers but also for other key workers by considering occupational risks, individual employee's health conditions, and nature of outdoor/indoor work and use of the appropriate masks after the risk assessment. Also, they highlighted the importance of providing suitable masks, training, fit testing, donning, doffing, and even discarding. Employers have been given the freedom to determine or direct employees not to wear masks if permitted based on the health care guidelines or on a case by case basis on certain circumstances (A Singapore Government Agency Website, 2020; Government of Singapore, 2020; Safe Work Australia,

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2020). For non-health workers who are closely associated with COVID-19 patients, special guidelines have been issued in some countries (Safe Work Australia, 2020).

Adverse effects on usage

Despite recommendations of universal masking, the observation shows that the directives on the use of the face masks are also based on possible adverse effects upon their usage. CDC and many other health authorities said children under two, people who have breathing difficulty, someone who is unconscious and someone who cannot move or took off a mask without help, are warned against harmful effects (CDC, 2020a). For certain employees, masks may experience distress/difficulty in breathing, tiredness, or headache due to increased resistance to breathing or reduction of air inhaled. In such conditions, guidelines recommend employers to consider regular breaks, slow down the pace of work, and encourage hydration to mitigate the adverse effects (A Singapore Government Agency Website, 2020).

Types of the mask depending on the risk or context

Another important principle is the risk of infectivity and specific contextual factors such as confinment in closed spaces, probability of close contacts, and the presence of probable infected patients for choosing types of masks. In the low probability settings, the government has recommended the use of cloth face masks in contrast to N-95 masks for hospital staff (CDC, 2020a; Government of Canada, 2020).

Change in practices in usage depending on demand and scarcity

Overwhelmed demand for PPE, including face masks, has created a shortage and scarcity in most supply chains in the health systems. In a situation where no other alternatives cannot meet with the demand and supply, some health authorities recommend PPE to be used even after the expiration date. Health workers can use them if the straps are intact and have no signs of visible damage (Australian Government Department of Health Therapeutic Goods Administration, 2020).

Quality assurance

Though most health authorities had issued technical and quality requirements for using medical face masks (Australian Government Department of Health Therapeutic Goods Administration, 2020; National Medical Products Administration, 2020), they failed to issue such requirements for various forms of self-made or commercial masks or face covers made of cloth or materials such as paper to be used as community masks (Australian Government Department of Health Therapeutic Goods Administration, 2020). Therefore, future authorities should pay attention to these important principles to ensure effective outcomes for the use of face masks.

CONCLUSION

Recommendations for using face masks by the governments discussed earlier are heterogeneous and inconstant. The contextual factors and expansion of knowledge on COVID -19 have affected those recommendations. Interestingly, the recommendations on the standard practices were seriously affected more by resource availability and feasibility than scientific judgment.

This commentary has presented several principles underlying the directives given by the government in relation to the use of face masks. However, within the

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dynamic context of the ongoing pandemic, it is evident that certain directives dominated based on the contexual requirements. Besides, thare was the simultaneous interplay between several principles influencing the authorities to give the directions. In that case, this article emphasizes that the healthcare decision makers should correctly identify the complex situations and dominant principles before giving recommendations for using face masks to the public.

CONFLICT OF INTEREST

The authors declared no conflict of interest in this article.

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ORIGINAL RESEARCH

EXAMINING THE GATEWAY HYPOTHESIS OF DRUG USE IN INDONESIA

Kajian Konsep Gateway Hypothesis Penggunaan Narkoba di Indonesia

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ABSTRACT

Background: Drug misuse is a global threat, including in Indonesia. Solving issues of drug use is by understanding the drug patterns. One of the important concepts related to public policy in drug addiction is the gateway hypothesis. However, not all researchers support this theory as the initation of drug use is debatable in terms of how a person starts to consume tobacco and alcohol, marijuana, and then other drugs.
Aim: This study identified a initiation sequence of drug use, particularly the gateway from soft to hard drugs and its reverse from hard to soft drug patterns.
Methods: This study employed a dataset of drug user patients aged 14–67 years from the Rehabilitation Center of National Narcotics Board in 2014-2018. The dataset was assessed using the Addiction Severity Index (ASI). Purposive sampling was utilized in the sample selection. The dataset was divided into three subsamples to identify the pattern. The subsamples included regular soft-drug users, regular intermediate-drug users, and regular hard-drug users. This study used a quantitative method and cross-tabulation approach along with descriptive statistics.
Results: Most of the drug users began consuming intermediate drugs and then soft drugs. Only early users followed the gateway pattern, while those in the intermediate and hard drug pattern mostly did not have the gateway pattern.
Conclusion: A policy about prevention of soft drug use (marijuana) in early use may be effective to reduce harder drug use in the future.

Keywords: drug use, gateway hypothesis, reversal pattern.

ABSTRAK

Latar Belakang: *Penyalagunaan narkoba telah menjadi ancaman tidak hanya di dunia, namun juga di Indonesia. Mengatasi masalah penggunaan ini salah satunya dengan memahami pola penggunaannya. Salah satu konsep yang penting penting untuk dipahami dalam kebijakan publik terkait ketergantungan narkoba adalah Konsep "gateway hypothesis". Namun, terdapat kontroversi seputar konsep gateway hypothesis tersebut, tidak semua penelitian mendukung konsep inisiasi penggunaan narkoba, mulai dari rokok dan alkohol, berlanjut ke ganja, dan kemudian narkoba jenis lainnya.*
Tujuan: *Untuk mengidentifikasi urutan dalam inisiasi penggunaan narkoba, khususnya adanya pola gateway (ringan ke berat) dan reversal (berat ke ringan).*
Metode: *Kami menggunakan data individu pasien pengguna narkoba berusia 14-67 tahun dari Balai Besar Rehabilitasi BNN dari tahun 2014 sampai dengan tahun 2018 dengan menggunakan Indeks tingkat keparahan adiksi/Addiction Severity Index (ASI). Purposive sampling digunakan untuk alat pengambilan sampel. Kami membagi data set menjadi tiga bagian. Yaitu pengguna awal narkoba jenis ringan, pengguna awal narkoba jenis sedang dan pengguna awal narkoba jenis berat. Penelitian ini merupakan penelitian kuantitatif menggunakan analisis tabulasi silang dan juga deskriptif statistik.*
Hasil: *Sebagian besar sampel pengguna narkoba memulai dengan narkoba dengan jenis sedang dan narkoba jenis ringan. Hanya pengguna awal narkoba jenis ringan yang mengikuti pola gateway, sedangkan untuk pengguna narkoba tingkat sedang dan keras, tidak sesuai dengan pola gateway.*
Kesimpulan: *Mencegah penggunaan narkoba jenis ringan (ganja) pada awal penggunaan dapat menjadi kebijakan yang efektif mengurangi penggunaan jenis narkoba yang lebih berat di masa mendatang*

Kata kunci*: gateway hypothesis, penggunaan narkoba, pola reversal.*

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INTRODUCTION

Drug misuse is a global serious issue. The 2019 World Drug Report reports that in 2017, 5.5% of adolescents and adults worldwide have consumed drugs at least once in the lifetime. The number of individuals with drug use experience had increased by 30% from 2009 to 2017. It happens partly due to a ten-percent global population growth in the 15–64 age group (UNODC, 2019). In 2017, the Institute for Health Metrics and Evaluation reported that 585,000 people worldwide died because of drug abuse. Most of the deaths are indirectly related to HIV and Hepatitis C, while the rest are directly associated with drug abuse, especially overdoses.

The National Narcotics Board (2017) reports that in Indonesia, the number of people who used drugs was 3.37 million people in 2017. However, the trend was declining from 4.7% in 2012 to 2.9% in 2017. The total seizure of marijuana (soft drug) was an increase from 13.9 tons in 2016 to 151.5 tons in 2017 (Kanato, Leyatikul and Choomwattana, 2017, 2018). The 2017 and 2018 ASEAN Drug Monitoring Reports state that the number of other substances, including crystalline methamphetamine (intermediate drug) was 2.63 tons in 2016 and 3.8 tons in 2017, respectively. Furthermore, the reports also mention the number of ecstasy (intermediate drug) rose almost doubled from 1.7 million tablets to 3 million tablets along with other drugs in just one year. In 2017, there were 20 cases with 27 suspects and assets worth more than 7.7 million USD for suppression of money laundering related to narcotics crimes.

To respond to this case, Indonesia has taken appropriate measures. Indonesian president, Joko Widodo, has declared a national emergency on drug users and urged to fight against all types of drug crimes. As Indonesia has a mission to reduce substance abuse and illicit trafficking, the National Narcotics Board is urged to be more effective in coping with the drug problems through demand reduction and supply reduction strategies. Demand reduction strategies are done by strengthening the community perception to fight against drug abuse, while supply reduction strategies are performed through strict and measurable law enforcement to fight against drug syndicates (National Narcotics Board, 2017).

Several factors may affect drug use in Indonesia, such as economic, geographic, and demographic factors. First, economic factors include price disparity, high demand on drugs, income gap, and ASEAN Economic Community Free Trade Agreement (Kanato, Leyatikul and Choomwattana, 2018). In terms of geographical and socio-economic factors, Indonesia has 17,508 islands with a large population of 250 million where domestic and foreign trade unions can operate drug trafficking trafficking (Kanato, Leyatikul and Choomwattana, 2017).

Generally, Indonesian drug users are most likely to use marijuana, then methamphetamine (meth) and ecstasy, respectively (National Narcotics Board, 2017). According to the survey conducted by the National Narcotics Board (2017), almost half of the respondents (47 %) began to use drug with marijuana. Other drugs are benzodiazepine and meth. The NNB reports that most of the drug users used more than one substance. Sixty-eight of 950 New Psychoactive Substances (NPS) have been identified and widely distributed throughout Indonesia by 106 countries and territories circulating the drugs worldwide (UNODC, 2019).

The starting step in overcoming drug use issues is by understanding drug patterns. Many studies have investigated

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the pattern of drug use. Traditionally, it is said that an individual who ever uses a drug tends to have a hierarchical sequential pathway. In other words, early use with alcohol or tobacco among adolescents can make them more addictive, and they will progress to illicit drugs later in adulthood. This concept refers to the "gateway hypothesis" (Kandel, 2002; Vanyukov *et al.*, 2012; Moselhy, 2013; Nkansah-Amankra and Minelli, 2016). Later, the term has extended to include marijuana that leads to the use of other drugs, such as cocaine and heroin (Fergusson, Boden and Horwood, 2006). The gateway hypothesis, defined as a sequence for drug use, usually begins with cigarettes and alcohol and progression to illicit soft drugs, including marijuana, and other hard drugs (Degenhardt *et al.*, 2011; Vanyukov *et al.*, 2012). The validity of the gateway hypothesis is based on two criteria: early use sequence between drug classes and its association in drug use (Kandel, 2002). It means that the sequence is hierarchical as it sees progression from lower drugs to hard drugs with the use of different substances in each sequence.

Many studies support the gateway hypothesis on identifying the progression of drug use. For instance, some studies claim that soft drugs, such as marijuana, have a significant role to progression of using other harder drugs (Kandel, 2002) However, there is a counter-argument against the gateway hypothesis. Several studies claim a "reversal gateway" sequence of substances, implying that drug users initiate illicit-to-licit or hard-to-soft drug sequence (Wells and McGee, 2008; Degenhardt *et al.*, 2011). Some previous studies conducted byWells and McGee (2008) in New Zealand and Degenhardt et al. (2010) in the United States show that the sequence began with the use of hard drugs before marijuana. A cross-national study done by Degenhardt et al. (2011) mentions that drug use rates in some countries were not affected by the prevalence of marijuana, which would be inconsistent with the gateway pattern . Another deviation of the gateway hypothesis in the study of Gfroerer et al. (2002) shows that most of the marijuana users in the United States only used marijuana and never progressed to other dangerous drugs, and this finding appeared to undermine the gateway hypothesis. In a recent report published by the Substance Abuse and Mental Health Services Administration (SAMHSA) in 2018, estimated 118.2 million Americans aged 12 and older had used marijuana at least once (Substance Abuse and Mental Health Services Administration, Rockville, 2019). The Substance Abuse and Mental Health Services Administration (SAMHSA) is the agency within the U.S. Department of Health and Human Services (HHS) that leads public health efforts to advance the behavioral health of the nation. Out of those who have used marijuana, many became marijuana abusers compared to other illicit drugs (Nöel and Wang, 2018). A study by Woodcock et al. (2017) in the United States finds that 20.3% of current regular heroin users deviated from the gateway hypothesis. Those who initiated heroin use at an earlier age used heroin for a longer duration more frequently than those who followed the gateway hypothesis. Given these contrasting arguments, this present study suggests that it is necessary to understand a sequential order in the initiation of drug use and provide valuable information for policy makers that target to prevent illicit drug prevalence. Policies to prevent the initiation and progression of drug use may be effective for preventing long-term drug prevalence (Deza, 2015). The typical gateway argument calls for policy preventing soft drug use to limit the

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possibility of using other hard drugs (Dewit *et al.*, 2000), while the reversal gateway argument requires policy emphasizing the prevention of soft drug use.

This study aimed to identify a sequential order in the initiation of drug use from both the gateway (soft-to-hard) and reversal gateway (hard-to-soft) patterns. Indonesia, where illicit drug use has prevailed and currently becomes a severe social problem, becomes the study's context. This study utilized a unique dataset of individual drug user patients hospitalized in rehabilitation facilities (inpatient treatment or drug use dependence) from 2014 to 2018, provided by the Narcotic National Board (NNB) Rehabilitation Center, West Java province, Indonesia. Three categories of illicit drugs consist of (i) soft drug (marijuana), (ii) intermediate drug (amphetamine), and (iii) hard drugs, based on the level of harm. Marijuana is a soft drug since its level of harm is relatively moderate and is unlikely to cause addiction (Moselhy, 2013). Amphetamine, a stimulant drug, is considered a relatively hard drug and is more likely to cause addiction (National Institute on Drug Abuse, 2020). The last category is whard drugs, which consist of several types of drugs, including heroin, cocaine, opiate, and benzodiazepine. Hard drugs are classified as the high-ranked group since they are relatively tense with high addiction and are perceived as harmful (Nutt *et al.*, 2007). Among the three categories, the level of harm of marijuana is the smallest. Then, amphetamine has the medium level of harm, and hard drugs, such as heroin and cocaine, has the largest level of harm (Škařupová, 2014)

In addition to the first stage to start illicit drug use, understanding the later stage in the sequence is crucial for policy makers. This study fills the gap which few empirical studies choose the gateway hypothesis in developing countries. Illicit drug use has prevailed in many developing countries that share similar economic, institutional, and social conditions, such as weak institutional frameworks and high poverty rates. An empirical analysis of the Indonesian cases would provide useful guidance for policy maker there. Furthermore, in general, the data of drug use has a reliability issue due to its sensitive question. For example, respondents are reluctant to reveal their real drug use history due to social norm concern, which may result in under-reported socially undesirable behavior (Johnson and Fendrich, 2005).

Since most empirical studies on drug use are survey-based, accuracy might be questionable. However, the NNB dataset contains the information of individual drug user patients; tendency to under-report their drug use history would be small. In case of discrepancies in reports from different sources, the information version from patients was considered the most accurate one (Sarkar *et al.*, 2016). Additionally, types of drug use pattern changes over time (UNODC, 2019), and thus a comprehensive examination of drug use with different types of substances is required. Thus, this study considers a broader range of drugs, covering not only marijuana but also other hard drugs, such as amphetamines, opiate, and cocaine.

This study applies to cross-tabulation analyses which does not intend to discuss the gateway drug at the first stage since it is impossible to be analyzed due to the unavailable data of non-drug users in the study's database. Instead, this study's analysis evolves around possible determinants of illicit drug use in the sequence seen from the gateway and reversal gateway contexts.

METHOD

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This study used a quantitative method and cross-sectional approach. It analyzed secondary data collected from patients in the Rehabilitation Center of National Narcotics Board in 2014-2018. Samples were selected using a purposive sampling technique. Additionally, cross-tabulation analysis and descriptive statistics were carried out.

The Rehabilitation Center of BNN is a government facility located in Bogor District, West Java Province, Indonesia. This data was restricted and the detailed description was obtained by the interview method during the assessment process of prospective patients using the Addiction Severity Index (ASI). ASI is an instrument in interviews collecting individual data about drug use, health, and social problems of people with alcohol and other drug problems (McLellan *et al.*, 1992). There are 3,703 data individuals observation; However, because our focus is only on early drug users who only use one type of drug only 2,811 individual data that qualified for analysis. Individuals who used multiple drugs in the entry stage were excluded (see Table 1.).

To identify a sequential order in the initiation of drug use, this study begins by identifying the samples of drugs. In the dataset, there were seven types of drugs in the regular use and the latest use, namely marijuana, meth, ecstasy, cocaine, opiate, benzodiazepine, and other unclassified drugs. Then, this study simplified the categories from the seven types into three groups based on the most favorable use in Indonesia (National Narcotics Board, 2017), availability of drugs (Degenhardt *et al.*, 2011), level of harms (Nutt *et al.*, 2007). The full sample consisted of three sub-samples: marijuana, amphetamine, and hard drugs (See Table 2). The first sub-sample was marijuana caregorized into marijuana group, the substance with less addiction (Deza, 2015), thus considered as a soft drug (Moselhy, 2013), and and the most widely used entry level drug in the present. The second sub-sample was an amphetamine, a stimulant drug reacting on the central nervous system (CNS) such as meth and ecstasy; it was considered a hard drug because it as very addictive (National Institute on Drug Abuse, 2020). However, it had a medium level of harm compared to cocaine and opiate/heroine (Nutt *et al.*, 2007). The last sub-sample, the hard drug group, consisted of cocaine, opiate, and benzodiazepine. Those were among seven high-ranked harm, according to parameters of Nutt et al. (2007). Other drugs unclassified are put into other drug groups since most of them contain new psycho substances (NPS) such as synthetic cannabinoids. These unclassified drugs were also considered having more harm than marijuana (Cohen and Weinstein, 2018). Hence, cocaine, opiate, benzodiazepine, and other unclassified drugs had a small number of observations. Therefore, they were included in hard drug groups. Then, this study dropped more than one entry drug from the dataset. In short, it just used the early single drug use categories as the measurement.

Then, the classification was done based on the sequence to identify the initiation order of drug use. The classification procedures were done in stages. First, regular drug use was categorized based on the level of harm, such as soft drug, intermediate drug, and hard drug. Then, the sequence patterns, namely the gateway pattern and the reversal pattern, were classified. To identify the rank, this study proposed some terminologies, namely, soft drug, intermediate drug, and hard drug in the dataset.

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Table 1. Summary of Drug Users based on the Level of Harm from 2014–2018.

	2014	2015	2016	2017	2018	Total	
	n	n	n	n	n	n	%
Entry level drug use							
Soft drugs	236	234	202	188	170	1,030	37
Intermediate drugs	335	372	366	266	314	1,653	58
Hard drugs	59	34	14	12	9	128	5
Lastest level drug use							
Soft drugs	19	23	18	21	11	92	3
Intermediate drugs	348	373	390	329	354	1,794	64
Hard drugs	40	19	10	7	5	81	3
Soft drugs and intermediate drugs	155	164	127	79	88	613	22
Soft drugs and Hard drugs	17	1	1	2	10	31	1
Intermediate drugs and hard drugs	28	29	17	19	13	106	4
Soft drugs, intermediate drugs and hard drugs	23	31	19	9	12	94	3

Notes: total observations = 2,811; early drug use is single drug user; soft drug users = marijuana users; intermediate drug users = meth and ecstasy user; hard drug users = cocaine, opiate, benzodiazepine, and other drug users.

Table 2. Characteristics of Drug Users based on Entry Drugs.

	Entry level drugs					
	Soft drugs		Intermediate drugs		Hard drugs	
	n	%	n	%	n	%
Gender						
Female	18	1.7	129	7.8	11	8.6
Male	1,012	98.3	1,524	0.1	117	91.4
Age						
Early adolescence = 14 – 19 years old	89	8.6	145	8.8	3	2.3
Late adolescence= 20 – 25 years old	325	31.6	471	28.5	16	12.5
Early adulthood= 26 – 35 years old	458	44.5	735	44.5	66	51.6
Late adulthood= 36 – 45 years old	150	14.6	256	15.5	39	30.5
Early Elderly= 46 – 55 years old	7	0.7	40	2.4	3	2.3
Late Elderly= 56 – 67 years old	1	0.1	6	0.5	1	0.8
Alcohol						
No	483	46.9	1,028	63.2	75	58.6
Yes	547	53.1	625	37.8	53	41.4
Religion						
Muslim	871	84.6	1,309	79.2	98	76.6
Non-Muslim	159	15.4	344	20.8	30	23.4
Education						
Low (NS/ES/JHS)	156	15.1	280	16.9	14	10.9
Middle (SHS/D)	753	73.1	1,139	68.9	91	71.1
High (UG/PG)	121	11.8	234	14.2	23	18.0
Marital status						
Divorced	75	7.3	157	9.5	26	20.3
Married	417	40.5	766	46.3	40	31.3
Single	538	52.2	730	44.2	62	48.4

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Work status						
Unemployed	395	38.3	588	35.6	64	50.0
Private firm	520	50.5	846	51.2	57	44.5
Public firm	115	11.2	219	13.2	7	5.5
Location						
Rural	267	25.9	425	25.7	6	4.7
Urban	763	74.1	1228	74.3	122	95.3
Total Observation	1,030	100	1,653	100	128	100

Notes: NS= never go to school; ES =Elementary school; JHS = Junior High School; SHS = Senior High School; D= Diploma; UG= Under Graduate; and PG= Post Graduate

RESULTS AND DISCUSSION

Drug Users' Characteristics

Table 1 shows most of the drug users began consuming intermediate drugs (n=1,653) and soft drugs (n=1,030). While, the lowest share was among the early hard drug users (n=128). According to UNODC (2019), the intermediate drug (methamphetamine) was the most alarming threat in Southeast Asia and East Asia. It has the highest increase in these regions. Meanwhile, the soft drug (marijuana) was the most common gateway drug used by Indonesian drug users (National Narcotics Board, 2017).

Male drug users were dominant in all types of entry level drugs. This result is in line with a report of the Center for Behavioral Health Statistics and Quality (2016) in the United States which mentions that men are more likely to use almost all kinds of illicit drugs than women. Regarding age group, male adults were more likely to use drugs than women (Buccelli *et al.*, 2016). However, female adults tended to have higher progression rates in a regular stage to addiction (Bobzean, DeNobrega and Perrotti, 2014; Poudel and Gautam, 2017).

Next, based on age, most of the drug users started to use drugs in early adulthood (aged 26-35) and late adolescence (aged 19-25). A study conducted by Nkansah-Amankra and Minelli (2016) has found that most drug users in the United States began drug use when they were teenagers. Age of 56 years and more is a state where individuals have less intention to try drugs for the first time. However, regarding the relationship between age and drug use, the elderly in the United States were more likely to begin using drugs with prescribed medications such as opioids and benzodiazepines (Mattson *et al.*, 2017).

Most regular drug users were non-alcoholic, except for regular soft drug users who were alcohol drinkers. Crost and Guerrero (2012) conducted research in Mexico, indicating that the consumption of soft drugs (marijuana) decreased, while the consumption of alcohol increaseds.

In respect with religion, the regular drug users of all drug types were mostly Muslims. There is little evidence regarding the relationship between drug use and certain religion. However, a study conducted by Marsiglia et al. (2005), show that stronger religiosity had more protection against drug use among youth American.

Based on education level, this present study explains all drug users of all types of drugs mostly graduated from senior high school or diploma. High education had the lowest share among the early soft drug users. On the other hand, some intermediate and hard drug users had low education. People finish senior high school or diploma in the adolescence and adulthood period. According to Nkansah-Amankra and Minelli (2016),

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adolescents were dominant drug users in the United States.

The smallest share of marital status in all entry level drugs was among the drug users who got divorced. Most of the early intermediate and hard drug users were married, while single early drug users had more than half share. Some research reveals that drug use was related to marital status. For instance, Kaestner (1997) finds that married people were less likely to use drugs in the United States. These results are also supported by Heinz et al. (2009) who find married people were less likely to use cocaine than unmarried people.

Besides, this study also indicates the early soft drug users and intermediate drug users mostly worked in private companies. Meanwhile, the smallest proportion of work among early hard drug users was public sevants. Working in private firms probably give high pressure on people's mentality compared to working in public service. According to the NNB's report (2017), the majority of drug users among workers use intermediate drugs for increasing stamina to make them less quickly tired. However, few empirical studies discuss about the relationship between drug use and types of employment.

Table 2 also illustrates the majority of all drug users lived in urban areas. Preferences in drug use might vary over various geographic locations. Stoops et al. (2005) have investigated American methamphetamine users and their drug-use profiles. Their finding highlights that urban methamphetamine users were more likely to use more than one substance daily due to more drug availability and more lifetime experimentation.

The Sequential Patterns of Drug Use

The sequential order in the initiation of all drug types is explained from two views: gateway pattern and reversal pattern. Those who regularly consumed soft drugs followed two patterns, gateway patterns, and neither gateway patterns nor reversal patterns. While, the early hard drug users followed the reversal pattern and neither gateway patterns nor reversal pattern. Interestingly, the early intermediate drug users had four patterns, such as gateway pattern, reversal pattern, both gateway and reversal pattern, and neither gateway patterns nor reversal pattern (see Table 3).

The majority of early soft drug users followed the gateway pattern (91%), while few progressed to non-gateway pattern and non-reversal pattern. This finding is in line with the gateway hypothesis and its existing studies (Nkansah-Amankra and Minelli, 2016).

More than half of the early hard drug users followed a reversal pattern (53%), and the rest followed neither gateway patterns nor reversal pattern (47%). In contrast, among the early hard drug users, the pattern was a reversal pattern, and they remained to use hard drugs at the end. This result is contradict with the gateway hypothesis which the initiation sequence of drug use starts from lower-ranked to high-ranked drugs. This result is consistent with previous studies (Degenhardt *et al.*, 2010, 2011), implying that drug users involved a reversal pattern. It is not consistent with the gateway theory because some deviant issues in the hypothesis, which is associated with no other drugs (Woodcock *et al.*, 2017; Nöel and Wang, 2018).

On the other hand, the early intermediate drug users mostly followed both a non-gateway pattern and non-reversal pattern (85%), and a small part of them followed gateway pattern, reversal pattern, or both gateway and reversal patterns. The majority of early intermediate drug users apparently deviated

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Table 3. Entry Level Drugs and Sequential Patterns.

Patterns	Entry level drugs		
	Soft drugs	Intermediate drugs	Hard drugs
Gateway only	943 (91%)	51 (3%)	-
Reversal gateway only	-	137 (9%)	68 (53%)
Both gateway and reversal gateway	-	31 (2%)	-
Neither gateway nor reversal gateway	76 (9%)	1,434 (85%)	60 (47%)
Total	1,030 (100%)	1,653 (100%)	128 (100%)

Notes: The share is showed in parentheses.

from the gateway pattern; It may be due to the progression that had no association with other drugs (Woodcock *et al.*, 2017; Nöel and Wang, 2018). Overall, the majority of the early soft drug users followed the gateway pattern, while the early hard drug users followed the reversal pattern. Lastly, the early intermediate drug users had a non-gateway pattern and non-reversal pattern.

However, our study has some limitations. Given our sample is using a clinic-based population of treatment seekers, generalization could be biased. Next, we use simplification by put specific drug use into a group; therefore, there is a possibility the character of the single drug is less accurate. We also consider that we have not been able to quantify or perform the kind of research needed to explore possible causality why these pathways vary of each drug type. Despite these limitations, the present study is the first study of the initiation of drug use and its progression in Indonesia.

CONCLUSION

In conclusion, this study finds that soft drugs to be more serious and risky subsequent as a gateway drug. The findings indicate that early soft drug use is associated with progression to the harder illicit drug use. This result also can be one of empirical evidence over debatable in legalizing soft drug (marijuana), where the danger of this substance exist in term of the progression. The progress of each three types of the drug differs; however, only regular soft drug users consistent with the gateway hypothesis. Regular intermediate and hard drug user, mostly contradict with gateway hypothesis. These findings suggest that preventing soft drugs (marijuana) in early use may be an effective policy tool to achieve the objective reduces harder drug use in the future.

CONFLICT OF INTEREST

The author stated that this study did not have any conflicting financial, professional, or personal interests.

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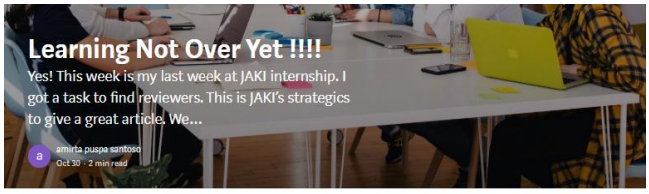

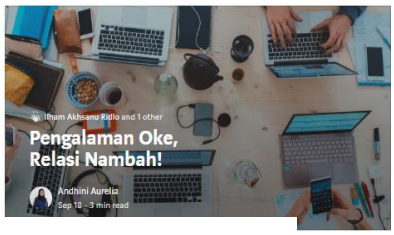

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Ilham Akhsanu Ridlo
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