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Indonesian Journal of Health Administration

Volume 9. Issue 2. December 2021

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JAKI
JURNAL ADMINISTRASI KESEHATAN INDONESIA
INDONESIAN JOURNAL of HEALTH ADMINISTRATION

ISSN: 2303-3592
Volume 9 No 2 December 2021

Jurnal Administrasi Kesehatan Indonesia (JAKI) is published by Universitas Airlangga, Faculty of Public Health, Department of Health Administration and Policy collaborated with Indonesian Public Health Union *(Persakmi)*. We welcome all of experts, practitioners, and academicians who are interested in healthcare administration to submit their articles. Articles in this journal discuss various current issues in healthcare administration. The publication is issued twice a year (June and December). JAKI has been indexed by DOAJ, Google Scholar, SINTA 2, Garuda, BASE, EBSCO, Hinari, and *Indonesian Publication Index* (IPI).

JURNAL ADMINISTRASI KESEHATAN INDONESIA
INDONESIAN JOURNAL of HEALTH ADMINISTRATION

ISSN: 2303-3592
Volume 9 No 2 December 2021

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JAKI
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INDONESIAN JOURNAL of HEALTH ADMINISTRATION

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Volume 9 No 2 December 2021

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Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.110-123

COMMUNICATION OF PROFESSIONAL CAREGIVERS IN ESTABLISHING INTERPROFESSIONAL COLLABORATION AT MEURAXA HOSPITAL, BANDA ACEH

Komunikasi Profesional Pemberi Asuhan dalam Membangun Interprofessional Collaboration di RSUD Meuraxa Banda Aceh

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Abstract

Background: Interprofessional collaboration for patient care is integrated cooperation between health workers in ensuring optimally consecutive patient care. Interprofessional decisions should be made in two ways between professional caregivers.
Aims: This study aimed to analyze communication between professional caregivers in establishing interprofessional collaboration at Meuraxa District General Hospital in Banda Aceh.
Method: This study was qualitative research and used a phenomenological approach. In-depth interviews and FGD were conducted with professional caregivers consisting of doctors in charge, nurses, pharmacists, and dietitians. All of the in-depth interviews and FGD were recorded and transcribed. Data obtained were analyzed thematically.
Results: Communication between professional caregivers in establishing interprofessional collaboration at the hospital had not been well-performed. Overall, they had not optimally utilized integrated patient progress records as they focused on taking care of their patients individually. They also lacked literacy about the information in the records. Inadequate time in serving patients and the insufficient number of human resources were presumed to hamper interprofessional communication.
Conclusion: Promoting interprofessional collaboration and effective communication regularly is required by the hospital management. They also need to evaluate the sufficiency of human resources, especially pharmacist positions. Besides, they can formulate supervision and evaluation systems of interprofessional communication between professional caregivers.

Keywords : collaboration, communication, integrated patient progress record, interprofessional, professional caregivers

Abstrak

Latar Belakang: *Kolaborasi interprofesional merupakan bentuk kerjasama antar tenaga kesehatan untuk memastikan keputusan asuhan pasien berjalan optimal dan berkesinambungan. Pengambilan keputusan bersama merupakan komunikasi dua arah antar Profesional Pemberi Asuhan (PPA).*
Tujuan: *Penelitian ini bertujuan untuk menganalisis praktik komunikasi PPA dalam implementasi Kolaborasi interprofesional di RSUD Meuraxa Kota Banda Aceh.*
Metode: *Penelitian ini merupakan penelitian kualitatif dengan pendekatan fenomenologi. Wawancara mendalam dan FGD dilaksanakan bersama PPA yang meliputi Dokter (DPJP), perawat, apoteker, dan ahli gizi. Proses interview dan FGD direkam dan ditranskripsi. Data dianalisis secara tematik.*
Hasil: *Praktik komunikasi PPA dalam pelaksanaan kolaborasi interprofesional di RSUD Meuraxa belum terlaksana secara optimal. PPA belum memanfaatkan Catatan Perkembangan Pasien Terintegrasi (CPPT) dengan baik karena lebih fokus melakukan asuhan secara mandiri. Budaya membaca informasi PPA lain dalam CPPT masih kurang. Keterbatasan waktu saat melakukan pelayanan dan kurangnya SDM disinyalir sebagai hambatan dalam melaksanakan komunikasi secara interprofesional.*
Kesimpulan: *Sosialisasi pelaksanaan kolaborasi interprofesional dan komunikasi efektif secara berkala perlu dilakukan. Pihak manajemen rumah sakit harus melakukan telaah staf untuk menyediakan SDM yang cukup, terutama profesi apoteker. Selain itu, mereka juga harus membuat pola supervisi serta evaluasi terhadap pelaksanaan komunikasi antar PPA*

Kata kunci*: catatan perkembangan pasien terintegrasi, kolaborasi antar profesi, komunikasi, profesional pemberi asuhan*

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
Volume 9 No.2 2021 DOI: 10.20473/jaki.v9i2.2021.110-123
Received: (2020-08-22) Revised: (2021-03-20) Accepted: (2021-06-07) Published: (2021-11-28)
Published by Universitas Airlangga in collaboration with Perhimpunan Sarjana dan Profesional Kesehatan Masyarakat Indonesia (Persakmi).

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.110-123

Introduction

Interprofessional collaboration for patient care is teamwork between health workers by establishing good communication and coordination to ensure decision on patient care is made altogether. Besides, it also ensures patient care can be performed optimally and consecutively. The concept of interprofessional collaboration was firstly introduced by the World Health Organization (WHO) in 2010. The WHO announced the need for the development of effective communication strategies, conflict resolution policies, and decision-making processes as an organizational culture mechanism. It should follow the interprofessional education and collaborative framework by the WHO to ensure patient safety and service quality (World Health Organization, 2010). Affective communication is one of the priorities in achieving patient safety in patient care (Commission on Hospital Accreditation, 2017).

Besides, service quality and patient safety can be maintained if there are easy access to health care, coordination in services, proper functionality of human resources, and multidisciplinary collaboration which potentially decline complications, length of treatment, conflicts between service providers, therapist malpractices, and even mortality rate (World Health Organization, 2010). A previous study conducted by Setiadi *et al.* (2017) discovered some constraints in establishing interprofessional collaboration in healthcare centers. The constraints included organizational culture, teamwork management, workplace design and layout, communication, and coordination.

Interprofessional collaborative services require staff to master four basic competencies which are value and ethics, role and responsibility, interprofessional communication, and team/teamwork. The interprofessional collaboration will not work well if one of the basic competencies is neglected (Interprofessional Education Collaborative Expert Panel, 2011).

Interprofessional communication, one of the basic competencies, should be mastered by professional caregivers or *Profesional Pemberi Asuhan* (PPA). Communication in patient care evolves communication between professional caregivers, as well as patients, and their families. Effective communication essentially can support providing the quality and completeness of patient care in timely and precise manner. The information delivered by caregivers should be understood by receivers. The Regulation of Indonesian Ministry of Health No.11 of 2017 concerning Patient Safety explains that improvement in effective communication is one of the six patient safety targets to establish a service system in healthcare providers (Indonesian Ministry of Health, 2017).

Interprofessional communication can be carried out by (1) opting effective communication strategies; (2) organizing and delivering information to patients, their families, and health workers in understandable written communication; (3) conveying knowledge and opinion confidently, precisely, and respectfully to caregiver team who then decide patient treatment. Moreover, it needs to be performed by (4) listening actively, digging ideas and opinion of other team members, (5) giving time and responding to others' feedback respectfully, (6) communicating in a good manner to avoid conflicts, (7) understanding the attributes of other professions during collaborative work, and (8) communicating with others consistently about patient and community care (Interprofessional Education Collaborative Expert Panel, 2011).

The Meuraxa District General Hospital in Banda Aceh city is a referral type-B district hospital that has been accredited by the Commission on Hospital Accreditation or *Komisi Akreditasi Rumah Sakit* (KARS) since 2016. The Hospital puts an effort to improve service quality as

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.110-123

seen in "Guide to Patient Care Service at Meuraxa District General Hospital in Banda Aceh in 2019" concerning Interpofessional Collaboration Practices. However, based on the observation results, the hospital's interprofessional collaboration has not optimally been implemented. The health workers have not applied two-way communication, and there have not been groups who share roles, expertise, and specific professional authorities in altogether decision-making on patient care. Decision-making was dominantly made by doctors in charge or *Dokter Penanggung Jawab Pasien* (DPJP). Other professional caregivers involved in patient care were more likely to execute and follow the doctors' instructions. They did not collaborate and share any roles. They rarely supervised and recorded patient care in integrated patient progress records or *catatan perkembangan pasien terintegrasi* (CPPT).

The observation on the integrated patient progress records and interviews with heads of rooms showed the pharmacists had never kept any patient care progress in the progress records since 2019. It indicated that they never took care of patients with their roles and group work. The head pharmacist asserted that the existing pharmacists had not personally taken care of patients, let alone collaboratively.

Interprofessional work collaboration and altogether decision-making will never be created if the professional caregivers prioritize their profession and do not perform two-way interprofessional communication directly or indirectly Therefore, this study aimed to investigate communication between the professional caregivers at Meuraxa District General Hospital in Banda Aceh city according to the concept of interprofessional collaboration.

Method

This study was qualitative research using a phenomenological approach to identify basic conceptions about individual clinical roles and teamwork among caregivers to achieve the interprofessional collaboration at Meuraxa District General Hospital. Therefore, this study invited the professional caregivers to be the research informants since they were directly engaged in patient care. According to Creswell cited in Sugiyono (2016), a phenomenological approach is used to collect data from participants and thus to understand a phenomenon based on their experience.

This study was conducted at Meuraxa District General Hospital in Banda Aceh city in June-July 2020. The researchers and informants worked at the same hospital. The researchers were managerial staff who did not bound any direct work contract with the informants as caregivers. The informants were doctors in charge, nurses, pharmacists, and dietitians. (1) The doctors should hold a license to practice at the hospital, had signed details of clinical roles or *Rincian Kewenangan Klinis* (RKK), had worked there for more than 2 years, and were willing to participate. (2) The nurses were clinical nurses at III, IV, and V levels, had a license to practice at the hospital, had signed details of clinical roles, and had worked for more than two years, as well as were willing to be the informants. (3) The pharmacists also held a license to practice at the hospital, had signed details of clinical roles and worked for more than two years, and were willing to be the informants. (4) Dietitians engaged in the research should hold a license to practice at the hospital, had signed details of clinical roles, had worked more than two years, and were willing to be the informants.

Data were then collected in two stages. At the first stage, face-to-face in-depth interviews were conducted with each informant in approximately 45 minutes. Each informant was given information about the objective and importance of the research and asked to sign informed consent forms before being invited to the interview. All of the informants agreed to take part in the

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p-ISSN 2303-3592, e-ISSN 2540-9301
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interview. The interview was conducted at the hospital in different locations which were selected beforehand by the researchers and the informants.

The interview was attended by the researchers and each informant. There were no multiple interviews with each informant. The interview was conducted using interview guides which described the broad questions about the interprofessional collaboration practice according to the WHO's framework and core competencies in the Report of an Expert Panel by the Institute of Medicine (IOM). Before the interview, all informants were briefed about the interview guide. The interview was then recorded using a recorder, and all data were collected until they were saturated. Audio transcriptions should match the interview recording and be returned to the informants for cross-checking and feedback.

The researchers themselves did analyze the data based on themes in a top-down manner without using any software. The analysis results at stage I were utilized to guide data collection at stage II. At the stage, Focus Group Discussion (FGD) was conducted to confirm and explore more information about issues arising at stage I. The FGD was done in about 2 hours facilitated by the researchers themselves. It was held in a meeting room with the Medical Commission of Meuraxa General District Hospital where the researchers and informants gathered. The FGD was done once by involving four informants that represented all professions While, informants for FGD were selected from those who had more complete answers during the interview, understood the issues being discussed in the research as well as were willing to participate in the FGD. The FGD was recorded using a recorder, and the results were transcribed and analyzed thematically by the researchers in a top-down manner. The results of in-depth interviews were then triangulated with the analysis results from FGD to yield conclusions.

Result and Discussion

Informant Characteristics

Twelve informants were aged about 30-45 years. They were all women, mostly graduated from a bachelor's degree (58.3%), and were married (83.3%). Regarding their profession, there were three doctors in charge, nurses, pharmacists, and dietitians, respectively (25%). Most of the informants had worked for more than 10 years (66.7%). Based on the Indonesia Statistics, eight informants had a high income of >3.5 million per month (66.7%) (Table 1).

Communication between Professional Caregivers

The researchers checked the data multiple times and collected themes matching the interprofessional collaboration frameworks by the WHO and IOM. The final results showed 10 themes in the interprofessional communication.

The FGD was done once by involving four informants that represented all professions. The analysis of in-depth interview results implied that three themes coded 3, 5, and 7 were found to require confirmation and exploration of the information considered contributing to the interprofessional collaboration.

Choosing Effective Communication

Direct communication was performed when the caregivers visited patients. If the caregivers could not attend the face-to-face visitation, they would communicate via telephone, WhatsApp, and written notes through integrated patient progress records.

> *"…We directly communicate, but we can also write notes in the integrated patient progress records if impossible to meet..."(02)*

> *"Our communication is normal. If no emergencies happen, we just visit patients as usual. However, if there is an emergency, we may call others. If we do not come across during the visits or emergency, we usually call others." (04)*

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p-ISSN 2303-3592, e-ISSN 2540-9301
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Table 1. Informant Characteristics

Category	N	%
Age (median)	40	
Sexes		
Man	0	0
Woman	12	100,0
Education		
Diploma	1	8.3
Bachelors	7	58.3
Masters	4	33.3
Marital Status		
Married	10	83.3
Unmarried	2	16.7
Professions		
Doctor in charge	3	25.0
Nurse	3	25.0
Dietitian	3	25.0
Pharmacist	3	25.0
Work Periode		
< 5 years	3	25.0
5-10 years	1	8.3
>10 years	8	66.7
Income (million)		
High (>3.5)	8	66.7
Upper Middle (2.5-3.5)	4	33.3
Lower Middle (1.5-2.5)	0	0
Low (< 1.5)	0	0

Sources: Primary data

"…We communicate directly via telephone or WhatsApp. Some professions such as nurses need to communicate face to face. Yet, for us, we rarely stay in our workspaces. Dietitian usually meets a doctor when they both visit patients." (06)

The Commission on Hospital Accreditation emphasizes that accredited hospitals should impose caregivers to prioritize patient safety which can be achieved through effective communication (Commission on Health Accreditation, 2017). Caregivers should possess individual skills and collaborative skills to support either direct or indirect effective communication. The caregivers at the hospital should be able to determine means of effective communication according to the current situation. Not to mention, the integrated patient progress records written by the caregivers are supposed to facilitate them to communicate in any circumstances if they carry out the program optimally.

Communicating and organizing information to patients, their families, and health workers in an understandable written notice

Almost all of the caregivers managed their patient treatment progress by using integrated patient progress records.

"Nurses recorded patient progress in the record. Doctors would record it by themselves. In the same way, the physiotherapist also creates their patient progress records." (01)

Patient progress recording had been performed well individually by 3 professional caregivers who were the doctor in charge, nurse, and dietitian, respectively. Only pharmacists had not reported any patient progress in the records.

"All of us including doctors, nurses, dietitians, physiotherapists and pharmacists have to report patient progress in the record. However, up to now, the pharmacists have not filled any patient progress yet. This is an exception just for pharmacists. The others filled in the record." (04)

The majority of caregivers explained the pharmacists had not carried out individual care, let alone collaborative care which was not observed in the integrated patient progress records. The pharmacists realized that due to the insufficient number of human resources, the caregivers could not perform clinical and pharmaceutical treatment properly. Despite clinical roles, the pharmacists also were responsible for

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
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the hospital pharmaceutical management. In their opinion, this task required a lot of time and thus made them difficult to manage their managerial roles and clinical pharmaceutical roles.

> *"Usually, only doctors, nurses, or dietitians input the patient status in the record, but based on the previous accreditation, the hospital mandates the pharmacists to input the data. They are supposed to be responsible for this role as well. As the pharmacists are so busy, they do not have a chance to meet patients face to face. With many responsibilities, they also need to report prescriptions. Until now, none of the pharmacists visit patients at this hospital. " (05)*

Patient care is always dealing with the use of available drugs. For example, the availability, interaction, and side effect of the drugs must be monitored. Of course, only pharmacists can understand most all of these aspects among other professions. The presence of pharmacists in patient care will help the processes of communication, information sharing, and decision-making together. However, if the opposite condition occurs, all of the processes will not work optimally. A previous study conducted at Bantaeng District General Hospital found a strong correlation between the implementation of integrated patient recovery recording and interprofessional collaborative work (Lestari, *et al.*, 2017).

Noting patient status in the records may encourage collaboration to optimize integrated services *(Kusumaningrum, et al.*, 2018). One of the means of communication used at Meuraxa District General Hospital was integrated patient progress records. It was deemed the most effective as it documented all of the notes from all caregivers.

> *"Usually, all statuses are written on the integrated patient progress records on the same date but in a different hour. Despite that, all of the caregivers' plans were reported there." (09)*

The records could help the caregivers communicate continuously about incoming treatment given by other caregivers with different roles even though they did not meet each other. A literature review concluded communication in the interprofessional collaboration could be improved by noting patient progress in the integrated patient recovery records (Ridar & Santoso, 2018).

Low literacy of caregivers on patient records and integrated patient progress records

Although most of the caregivers had accomplished their roles, the majority mentioned they did not read other caregivers' notes. This responsibility has something to do with the personal awareness. Limited time to serve and difficulty in reading others' notes were the reasons why the caregivers did not keep writing the patient progress. Caregivers' notes about consultation and indirect instructions in the records were usually verified by the doctors in charge.

> *"In reality, it depends on each caregiver. Some caregivers are aware of, and others are not. It is about their unavailable time and difficulty in reading others' notes. However, not all caregivers had the same problems. Some also have verified and checked the records, but others have not. Some only ask about some information." (09)*

The caregivers focused more on their personal task of patient care and thus never collaborated on that. They just summarized all required information for patient treatment. A study on interprofessional collaboration at a hospital found problem-solving from the records was made individually rather than collectively. As a result, patient reporting was centralized based on their expertise or unintegrated between expertises,

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
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leading to disabled interprofessional collaboration (Susilaningsih, *et al.*, 2017).

Low literacy of the caregivers on the records also possibly leads to patient safety incidence. The Commission on Hospital Accreditation emphasized patient care should prioritize patient safety to the utmost through effective communication, which is writing, reading, and verifying or *Tulis Baca Konfirmasi* (TBaK) and Situation, Background, Assessment and Recommendation (SBAR) (Commission on Hospital Accreditation, 2017).The Meuraxa General District Hospital has managed the regulation of effective communication for patient care. Caregivers' instructions noted on the records from a direct consultation are supposed to be re-read and verified as well as confirmed for accuracy. If not, patient safety incidence may happen due to less meticulous reading records.

The results from FGD strengthen the finding by saying that the nurses always read patient progress records by the doctors in charge. Contrarily, the dietitians did not read them. The nurses only read important notes, while the dietitians only read notes concerning the patient's nutrition status. This indicated the dietitians rarely read nursing care notes. Besides, the doctors in charge communicated with others more often about patient progress and asked directly about important information once they visited patients along with other caregivers.

> *"We always read every note in integrated patient progress records from doctor and even checked it multiple times if we feel unsure. We have to read all notes from the doctors even multiple times. While, we just scan the information related to Assessment, Diagnosis, Intervention, Monitoring, and Evaluation (ADIME) informed by the dietitians. The order of information and other items in the ADIME were just scanned." (09)*

The records as a means of communication were not optimally used, while ideally, the caregivers had to acknowledge every patient progress from each view of each profession to improve the patient care quality. Different educational backgrounds, knowledge, competency level, affect the caregivers to perform patient care individually. Consequently, they need others' competencies for more optimal patient care. Literature search inferred that good service quality depends on professionals who cooperate with different profession (Rokhmah and Anggorowati, 2017). Research at Sawerigading Palopo District General Hospital also grounded a relationship between education background and teamwork, and a similar finding was also observed at Andi Djemma Masamba District General Hospital (Hardin, 2019).

Low literacy on caregivers' reports occurred since the caregivers were not educated well about interprofessional communication in the professional training. Research on the different perceptions of interprofessional education showed most students majoring at the medical department in Indonesia did not agree with indirect communication between caregivers. They thought that indirect communication would not make them understand about patient progress completely. However, indirect communication including patient status records could support collaborative communication between caregivers (Syahrizal, *et al.*, 2020).

Open education and information to patients and their families

Almost all of the caregivers ever communicated with patients and their families by educating them and sharing information about the treatment given. They ever gave chances for them to respond to the information. The caregivers used simple language to communicate with patients and their families, thus

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p-ISSN 2303-3592, e-ISSN 2540-9301
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making them more understand the information.

> *"First, we motivate them and inform them about the benefits and objectives of the treatment. We also explain the consequences if the therapy is not administered. If the patients are not committed, we will then inform the doctors in charge. However, we explain about the objectives and side effects of the therapy first to the patients." (07)*

Doctors in charge have the most significant roles in delivering and educating the patients about the information. Patients' trust will improve if the doctors communicate with them directly. A previous study on doctor-patient communication in a primary health care pointed out patient-centered communication could improve patient compliance with medication, achieve medication success, increase patient satisfaction, ease to enforce the diagnosis, and minimize malpractices (Larasati, 2019).

Speaking good words to patients and their families will make them feel respected and prevent conflicts due to inconvenient interactions. Communicating with different patients requires caregivers to master different communication techniques and approaches. Communicating with younger educated patients will be different from that with older patients who have cognitive decline. Culture, language, and patience trait factors are required when caregivers communicate with older patients**.** They often have troubles when communicating with older patients who have less cognitive abilities. With that said, certain communication techniques applied should be practiced to certain patients, for example by using simple words and speaking slowly (Callinan and Brandt, 2015).

Interpersonal communication between caregivers

The majority of the caregivers communicated interpersonally instead of interprofessionally. Limited time hampered the communication between the doctors, nurses, and dietitians, especially when they communicated during visits to inpatient rooms. The doctors seemed in hurry due to their packed schedule when serving patients. The dietitians could not stand by all the time in the same room while waiting for the doctors to visit. They were assigned for checking two or three rooms per day; therefore, they sometimes asked the nurses to deliver the information from one profession to another as they did not have a chance to meet face to face and communicate with other professions. For instance, the nurses would inform dietary changes arranged by the dietitians or reported drug interactions and side effects informed by the pharmacists to the doctors in charge. The doctors in charge, pharmacists, and dietitians asserted that the nurses were always available 24 hours in patient rooms and thus present in a call at any time. These results were retrieved from the following interview excerpts.

> *"Each one first. Nurses will stand by in the room, so that we can communicate everytime. But with doctor, at a later time when you see a doctor. But if it is an emergency, we ask for the nurse to contact the doctor." (08)*

As the caregivers rarely met face to face with other professions, they were more likely to reach people working closest to them instead of interacting with all caregivers with the same or different expertise. Communication bridged by the nurses impedes effective interprofessional communication. Irwan Hartana (2016) explained effective communication occurs when all professionals who hold significant roles are in interactive and convenient communication. The effectiveness of communication is determined by the

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.110-123

validity of information and involvement of professions in idea creation altogether (Hartana, 2016). If nurses do not work with other professions to handle patients, there will be a misperception of patient care.

Communication is conveying of messages between one individual and more to have a mutual understanding. Generally, communication is done using simple words that are understood by two people or more. Not all nurses have good communication to convey messages from other professions. A study conducted at Wava Husada Hospital highlighted contraints in patient care such as doctors' communication styles, limited time of communication, and low nurses' communication competencies (Nazri, et al., 2015).

All of the caregivers involved in the FGD gave stronger evidence that they did not communicate with others in an interprofessional but interpersonal manner. The in-depth interview results further confirmed that the nurses often provided a bridge to deliver messages to other caregivers as the caregivers did not have a chance to meet face to face. This situation occurred because of limited time and perception that communication will be easier with the nurses since they were available in a call at any time.

> *"We barely meet face to face. However, a nurse will be standby in each room. With that, we usually communicate everything with the nurse. For example, when a patient has lower blood pressure, the nurse will inform the doctor who will then ask him to change the nasogastric tube for administering food. We communicate more frequently with the nurse assigned in the room." (03)*

Doctor-nurse communication is more dominant at the hospital. The doctors and nurses admitted that they had the key roles to take care of patients. In doing so, doctor-nurse communication is the most continued and intensive interprofessional collaboration. Utami (2018) mentioned doctors and nurses showed a positive attitude and high interaction and interprofessional collaboration. However, doctors could not deliver all their messages to nurses as they lacked knowledge of the doctors' medication. Wrong information delivered will potentially harm patient safety.

Conveying of opinion and knowledge according to caregivers' expertise

Most of the caregivers had the freedom to convey their opinion according to their knowledge when collaborating with others.

> *"We are free to give our opinion to others as long as it is related to our expertise. Like this and that. Others will also speak about their findings." (09)*

Some caregivers thought doctors, who had higher responsibility for patient therapy, responded less and just prioritized their tasks.

> *"...Some doctors agreed with our opinion, but others did not care. Instead, they are the ones who have primary tasks for patient treatment. It is just some though." (07)*

Giving of opinion and therapy decision-making were dominated by the doctors, while other professions were reluctant to convey their messages and recommendations according to their expertise. This communication flow will hinder interprofessional collaboration that values the balance of tasks between individuals and teams as recommended by the WHO (World Health Organization, 2010). The same situation also occurred at dr. Sardjito Yogyakarta Central General Hospital where doctors were deemed as leaders who took decisions and gave instructions to other professions including nurses (Fatalina, et al., 2018).

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p-ISSN 2303-3592, e-ISSN 2540-9301
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Active listening and digging for ideas and opinion

Few caregivers had active communication, for example, sharing information and listening to others' suggestions from the same or different expertise. When they visited patients, they did not exchange any information or receive any opinion from others. Communication between the caregivers was often bridged.

> *"Overall, doctors want to listen. Well, it depends on whether they accept our opinion or not. Some less care of our opinion, while they hold primary jobs for patient therapy." (07)*

> *"The pharmacist is supposed to be in the room since they need to supervise the food intake which possibly contradicts the drugs prescribed. Therefore, they can exchange information about food restrictions. However, in reality, we never did it." (8)*

> *"I do not know if any dietitian is standby in the room, but everytime I visit the room, there is one there. When I did not visit the patient, I called the nurse to inform me about dietary changes." (12)*

Interpersonal communication just transmits messages and exchanges of ideas on patient care from the circle of the same experts. Difficulty in scheduling interprofessional meetings led to the absence of interprofessional visits to inpatient rooms. Normally, regular interprofessional visits may result in advanced patient quality. A study on the effect of mutual visits at a hospital in the United States showed the caregivers could discuss how to identify each patient's problems and progress, as well as patient status for being able to discharged (Reeves, *et al.*, 2017). Another study discovered regular team meeting was an effective strategy to improve coordination and communication between caregivers (Setiadi, *et al.*, 2017).

From the results of FGD, only one informant mentioned that the caregivers ever conducted meetings to dig ideas and opinions from others.

> *"The dietitians usually give their suggestions by saying 'Doctor, the patient only took the drug at something cc. We have not decided to administer the drug less frequently or more with a smaller volume'. We still listen to their suggestions. The nurses also inform us since they visit patients in 24 hours. We hear patient progress from the nurses or dietitians. While probably the patient then got diarrhea, so they need to rub oil or use other ways. The nurses or dietitians will inform us as well. The dietitian said, 'Doctor, the calorie intake can be sourced from the food, not low-fat food.' So, we still communicate with each other." (12)*

The results of FGD reinforce the results of the in-depth interviews. Active listening to ideas and recommendations based on the expertise was only confirmed by very few caregivers. Meanwhile, interprofessional collaboration integrates all expertises to formulate service models (Canadian Interprofessional Health Collaborative, 2010)

Giving of time and responding feedback respectfully between caregivers

Very few caregivers confirmed that the caregivers gave feedback respectfully to the progress of patients under others' supervision.

> *"…But, hmm we need to admit that we do not cooperate with other professions. For us as pharmacists, we could collaborate with other*

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p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.110-123

pharmacists assigned for patient care well. However, there is no formal discussion at all. If an incident occurs, we take action individually with caregivers who have the same expertise…" (03)

Lack of communication between caregivers impedes cooperation and the need for information exchanges to optimize the hospital services. Interprofessional collaboration is a state where a variety of health workers work together with patients, their families, other professions, and the community to provide good quality service (World Health Organization, 2010).

Communicating in a good manner to avoid conflicts between caregivers

All of the informants communicated with good words to avoid conflicts. The conflict management either for individual conflicts or complicated conflicts between groups had been performed well. Individual conflicts were resolved through direct confirmation to parties in conflict, and complicated conflicts were solved with the help of hospital management.

"...We speak to the person decisively without being opinionated in addition to that our knowledge is lower than the seniors'. Although they do not accept our arguments, we feel good because we can solve the conflicts. It is the most important..." (03)

Susilaningsih (2016) cited in Rokhmah (2017) argued hospital services involve multidisciplinary services which potentially overlap, cause interprofessional conflicts, and tardiness in medical check and treatment. The conflict management among the caregivers at the hospital ran well. Miscommunication arising often could still be resolved individually although some miscommunication still required the hospital management's help. All conflicts must be resolved through reconciliation, thereby avoiding any resentment. Resentment is the state where someone is reluctant to meet in caring of patients together. The literature search found good services depend on the types of professions who work in a team (Rokhmah and Anggorowati, 2017). The caregivers would feel safe and comfortable in caring for patients together if they communicated with each other respectfully.

Understanding the attributes of other professions in the collaborative work

The caregivers understood that in certain circumstances, they should consult about a patient condition with other professions. The result is according to the following interview excerpt.

"In handling patients, we need other professions, either nurses, dietitians, or pharmacists. All of them need to work together to treat a patient." (10)

Caregivers cannot give treatment to patients and convey information that is not relevant to their competencies. Every profession has its attributes. The collaboration will not be optimal if one of the professions does not contribute to taking care of patients. Collaboration is interprofessional communication and decision-making in which healthcare workers can share their knowledge and capabilities for patient treatment (Canadian Interprofessional Health Collaborative, 2012).

Conclusion

Communication between caregivers in establishing interprofessional collaboration at Meuraxa District General Hospital was not optimal yet. The caregivers did not have competencies of interprofessional collaboration as expected. As a result, communication just occurred in the interpersonal but interprofessional manner. Integrated Patient progress records were not functioned well by the caregivers who

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p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.110-123

tended to focus on their task of patient care. Moreover, caregivers' literacy on the patient records was lacking. Time limitation for service and the inadequate number of human resources are assumed to hamper interprofessional communication.

It is suggested that the hospital evaluates the needs of caregivers by considering the workload analysis and balance in collaborative service provision. The hospital management could recruit more human resources, especially pharmacists to optimally perform clinical pharmaceutical treatment for inpatients.

Regulations on communication through interprofessional collaboration need to be formulated comprehensively and should not be limited to the application of writing, reading, and verifying techniques as well as Situation, Background, Assessment, Recommendation (SBAR) techniques. The hospital has to develop and adjust the regulations for collaborative work according to the guidelines of interprofessional collaboration by the WHO, Canadian Interprofessional Health Collaborative, Interprofessional Education Collaborative Expert Panel, and other organizations. The regulations must be promoted continuously to make caregivers understand interprofessional collaboration.

Regular training on effective communication is necessary to conduct. Besides, the hospital management needs to form supervision and evaluation mechanisms for direct communication i.e., patient visitation and indirect communication i.e., integrated patient progress records. All of these efforts are made to enable communication among all professions to work on providing optimal patient care.

Abbreviations

RSUD: Rumah Sakit Umum Daerah (District General Hospital); FGD: Focus Group Discussion; PPA: Profesional Pemberi Asuhan (Professional Caregiver); DPJP: Dokter Penanggung Jawab Pasien (Doctor in charge); CPPT: Catatan Perkembangan Pasien Terintegrasi (Integrated Patient Progress Record); SDM: Sumber Daya Manusia (Human resource); WHO: World Health Organization; KARS: Komisi Akreditasi Rumah Sakit (Commission on Health Accreditation); RKK: Rincian Kewenangan Klinis (Clinical roles); ADIME: Assesment, Diagnosis, Intervention, Monitoring and Evaluation; TBaK: Tulis, Baca, Konfirmasi (Writing, Reading and Verifying); SBAR: Situation, Background, Assesment and Recommendation.

Declarations

Ethics approval and consent to parcitipate: this study has been approved by the Commission on Research Ethics, Faculty of Medicine, Syiah Kuala University, and dr. Zainoel Abidin District General Hospital with No. 083/EA/FK-RSUDZA/2020. Conflict of interest: there is no conflict of interest in the research. Availability of data and material: not applicable. Funding: none. Author's contributions: conceived, drafted and revised the manuscript. Acknowledgements: none.

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Literature Review

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.161-179

POLICY PERSPECTIVES OF MITIGATION AND RECOVERY DURING COVID-19 PANDEMIC: A NARRATIVE REVIEW

Perspektif Kebijakan Mitigasi dan Pemulihan Pandemi Covid-19: Tinjauan Pustaka Naratif

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Abstract

Background: The world is in the grip of an unprecedented novel COVID-19 pandemic. These have resulted in massive impacts on humans as well as on economies invariably. Hence, planning for a future pandemic is vital in minimizing deleterious effects.
Aims: The current review aimed to derive common policy perspectives that are important in future planning of a pandemic.
Methods: A narrative review was conducted by searching published articles from PubMed, Medline, Scopus, CINAHL, and Google Scholar. Forty-eight articles were selected for the review.
Results: The policy perspectives derived under mitigation were rearranged into surveillance, epidemiology, and lab activities. The policy perspectives under recovery derived were related to economy, supply chain management, sustainable and green concept, and health system.
Conclusion: Understanding common policy perspectives is important in the mitigation and recovery planning of a pandemic with similar nature in the future. The spillover effects in response to the mitigation measures are deemed vital in planning mitigation and recovery measures for future pandemics. Global and regional resource sharing mechanisms are vital when a universal shortage of healthcare resources occurs.

Keywords: mitigation, pandemic management, policy perspectives, recovery

Abstrak

Latar Belakang: *Seluruh dunia menghadapi pandemi COVID-19 yang tidak menentu. Intervensi ini telah menimbulkan dampak yang besar bagi manusia dan perekonomian. Maka, perencanaan pandemi di masa yang akan datang sangat penting untuk meminimalisir dampak buruknya.*
Tujuan: *Tinjauan ini bertujuan menghasilkan perspektif kebijakan umum yang penting untuk perencanaan pandemi di masa yang akan datang.*
Metode: *Tinjauan naratif dilakukan dengan menelusuri artikel yang terbit di PubMed, Medline, Scopus, CINAHL, dan Google Scholar. Sebanyak 48 artikel dipilih untuk diulas.*
Hasil: *Perspektif kebijakan yang diturunkan terkait mitigasi meliputi pengawasan, epidemiologi, dan aktivitas laboratorium. Perspektif kebijakan berkaitan dengan pemulihan ekonomi, penanggulangan rantai pasok, konsep keberlanjutan dan ramah lingkungan, serta sistem kesehatan.*
Kesimpulan: *Pemahaman mengenai perspektif kebijakan secara umum sangat penting untuk perencanaan mitigasi dan pemulihan pandemi dengan ciri-ciri serupa di masa yang akan datang. Dampak spillover yang berkaitan dengan langkah-langkah mitigasi dianggap penting untuk merencanakan langkah-langkah mitigasi dan pemulihan pandemi di masa yang akan datang. Mekanisme pembagian sumberdaya di tingkat regional dan global penting dilakukan saat sumberdaya pada pelayanan kesehatan tidak mencukupi.*

Kata kunci*: mitigasi, pemulihan, penanggulangan pandemi, perspektif kebijakan*

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
Volume 9 No.2 2021 DOI: 10.20473/jaki.v9i2.2021.161-179
Received: (2020-09-24) Revised: (2021-06-07) Accepted: (2021-08-04) Published: (2021-11-28)
Published by Universitas Airlangga in collaboration with Perhimpunan Sarjana dan Profesional Kesehatan Masyarakat Indonesia (Persakmi).

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.161-179

Introduction

In the dawn of 2020, the world has faced an unprecedented threat of COVID-19, a newly emergent virus that resulted in a pandemic COVID-19. It was originated in Wuhan, China at the end of 2019. It has spread across many continents, challenging the existing healthcare systems there (Tabish, 2020). COVID-19 has a gamut of impacts, quantifying the direct impact on human lives as of May 21st, 2020, with 5,016,171 confirmed cases and 328,471 deaths worldwide (John Hopkins University of Medicine, 2020). In response to the rising number of cases and deaths, non-pharmaceutical measures have been implemented globally in varying combinations since the therapeutics and vaccine are yet to be developed for this novel virus (S. Lai *et al.*, 2020). The world is grappling to curb the transmission of COVID-19 with concerted efforts, though certain characteristics of the virus have made measures more complicated. The long incubation period, high transmissibility, pre-symptomatic and asymptomatic cases that infect others, and knowledge gap due to the novelty of the virus are some of the factors that largely have contributed to the apparent deleterious effects of COVID-19 (Nunesvaz, 2020).

The nature of the virus, unavailability of preventive and treatment measures, direct and indirect massive impacts COVID-19 have emphasized the need for mitigation and recovery planning for such catastrophe in the future (Douglas *et al.*, 2020). Further, the relentless globalization and increasing global human interactions have profoundly influenced the transmission of infectious diseases potentially across distant countries, again highlighting the imperative need for national pandemic management planning (Wirth, 2018).

Mitigation mainly focuses on slowing the transmission, protecting the population and preventing the overwhelming healthcare system by executing mitigation measures at the individual level as well as at the community level (Nova Scotia Health Authority, 2020; Shearer *et al.*, 2020). However, recovery measures have been implemented primarily in an attempt to resume normal operations through a planned and coordinated approach (Nova Scotia Health Authority, 2020). The implementation of mitigation and recovery measures was supported with the relevant public health policies that have already been available, amended, or newly developed accordingly (The Organisation for Economic Co-operation and Development, 2020). Nevertheless, heterogeneity was evident in policy options implemented in response to COVID-19 across the countries, as well as across the sectors.

The fast and untenable spread, global scale, longer disease duration, and devastating direct and indirect impacts complicate the COVID-19 policymaking process (Weible *et al.*, 2020). In general, policymaking inexorably involves the trade-offs between social, political and ethical values, opinions, interests, and priorities (Verboom, Montgomery, and Bennett, 2016). However, the controversies, differences, and confusions observed in policy perspectives have spawned the need for pragmatic public health policies to be adopted during the COVID-19 pandemic and similar outbreaks to other potential pandemics (Weible *et al.*, 2020). Hence, this study took a chance to review the decisions and actions undertaken for mitigation and recovery measures during the COVID-19 pandemic and identify common policy perspectives for combatting the massive effects of other pandemics globally. According to the background of the issue, the present study aimed to review the current literature on mitigation and recovery responses during the COVID-19 pandemic and derive policy perspectives deemed imperative for the preparedness of a future pandemic with common nature.

Method

Literature Search

The article search was performed on PubMed, MEDLINE, Scopus, and CINAHL. The period covered in the search was from January 2020 to May 2020. Review protocol has been used to make the process clear and consistent

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p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.161-179

thoroughly. Database search was done manually to the lists of identified articles. Besides, some primary articles within grey literature were also discovered in Google Scholar. Further, Google search was also used to identify the relevant documents from the government institutional websites to support the scope of interest and find preprint articles due to inadequacy of peer-reviewed literature at the moment of the data collection. Search strategies were finalized with the inputs of a research librarian (Supplementary material- Search Strategies). The search terms used were Response*, Mitigation*, Recovery*, Rehabilitation*, Reconstruction*, Pandemic*, COVID-19, Coronavirus 2019, and SARS-CoV-2. Only articles including human subjects and in the English language were included in the study.

Data extraction and analysis

To identify whether articles and reports met the inclusion criteria, five review authors screened the titles, abstracts, and summaries of all retrieved records. These articles and reports were selected independently, and the results were discussed to decide on the final selection. After reading the full texts of all eligible articles and reports, a collective final decision was taken for each record. The selection process has been summarized in Figure 1

The reports published with guidance in response to COVID-19 mitigation and recovery measures were also included in the review in addition to those found in the databases. Data extraction was also performed by all five reviewers independently in a structured format. Any disagreement among the reviewers was discussed after the completion of the data collection process. Initially, sub-themes were identified, and secondly, main themes were identified amalgamating the sub-themes by all of the authors via teleconferences. Then, the common policy perspectives were synthesized by amalgamating the main themes observed mainly under COVID-19 mitigation and recovery. The results were summarized and reported in a format adopted from the Influenza pandemic plan in the United States (U.S. Department of Health and Human Services (HHS), 2017).

Result and Discussion

A total of 48 articles were included in the fi nal review. The policy perspectives that were universally discussed during mitigation were rearranged as can be seen in Table 1. The policy perspectives under COVID-19 recovery generally conversed were related to economy, supply chain management, sustainable and green concept, and health system (Table 1).

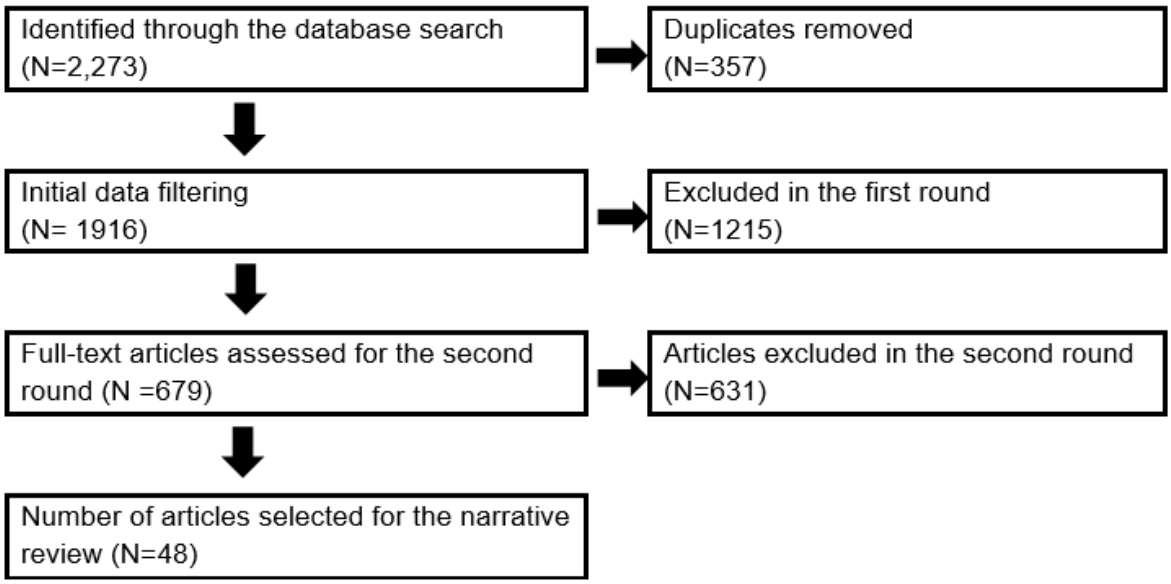

Figure 1. The selection process

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p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.161-179

Table 1. Common Policy Perspectives in Mitigation and Recovery Phases.

Phases	Policy Perspectives
1. Surveillance, epidemiology and lab activity	Ensure continuous supplies of laboratory test facilities, as well as need regional and international policies for laboratory testing and supply of resources (Walker *et al.*, 2020) Need to explore long term course of the disease to understand the seasonal patterns, population herd immunity and zoonotic genome changes (World Health Organization, 2020) Need to consider epidemiological characteristics of the virus such as virulence, infectivity, R0 factors (World Health Organization, 2020) Need to concern enhanced sensitivity of global surveillance and response system, real-time tracking and alert system that is active both regionally and globally (Desjardins, Hohl and Delmelle, 2020).
2. Community mitigation measures	Need principles of population categorization when resuming back to activities to reduce exposures (Lasry *et al.*, 2020). Respect social and cultural values during policy development and funeral/burial/cremation guidelines (Crubézy and Telmon, 2020). Need a strong approach for multisector, multidisciplinary policy expressions due to the wide scopes of the disease (Chen, Cao, and Yang, 2020). Consider political bureaucracy versus social freedom in the implementation of lockdown strategies (Radwanski and Semeniuk, 2020) Consider human rights aspects of public health measures due to negative spillover effects (Shuja *et al.*, 2020) Consider smart containment and mitigation measures versus lockdown measures by taking into account context-specific factors (Ebrahim *et al.*, 2020) Need special attention for asymptomatic case management, considering up to 80% of the cases are asymptomatic Apply GIS and AI technology for public health measures and social cohesion (Drew *et al.*, 2020; Kamel Boulos and Geraghty, 2020) Need guidelines issued for public on the use of PPE (Wong *et al.*, 2020) Apply mitigation measures for international travel (Ebrahim *et al.*, 2020) Apply additional measures to prevent the disease transmission at workplaces (Anderson *et al.*, 2020)
3. Medical countermeasures, diagnostic devices, vaccines, therapeutic, and respiratory devices	Provide continuity of medical supply chains for the PPE, ventilators and laboratory testing equipment (Bruinen de Bruin *et al.*, 2020) Need alternative production sites for PPEs Need global monitoring mechanisms for supply chain Encourage national production of medical supplies (Bruinen de Bruin *et al.*, 2020; Heymann *et al.*, 2020)
4. Healthcare system preparedness and response	Need public-private partnership in service provision (Parodi and Liu, 2020) Transform the health sector from patient-centred to community-centred principles. Important to identify barriers or facilitators and external effects (Nacoti *et al.*, 2020)

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	Transform leadership styles when cases surge, and need more autonomy for local and institutional level leaders (Hammer and Alley, 2020) Need principles of population cohorting for resource allocation considering the disease and its epidemiology Put special concerns for on the provision of PPE and training, especially on CBRN and on screening and diagnostic facilities for healthcare staff (Australian Government, Department of Health, 2020) Identify specific workforces, such as the number of health frontline staff and other non-health-military and key workers/volunteers with the appropriate knowledge skills and abilities (Shuja *et al.*, 2020) Reduce hospital burden and preparing hospitals for surge Create Innovative approaches for community triage and referral to healthcare institutions (Ayebare *et al.*, 2020; Lurie *et al.*, 2020) Invest in public health infrastructure (Walensky and Del Rio, 2020)
5. Communication and public outreach	Need risk communication, unique features in risk communication, such as mighty real-time, electronic-based, and trustworthy risk communication by formal authorities (Heymann *et al.*, 2020; Igoe, 2020; Walker *et al.*, 2020) Place a special concern for vulnerable and high-risk groups
6. Scientific infrastructure and preparedness	Conduct research and development considering international collaboration, proactive planning and research allocation (Li *et al.*, 2020; Li, Liu, and Ge, 2020; Yip *et al.*, 2020)
7. Need domestic and international response policies, incident management and global partnerships and capacity building	Seek for all opportunities for local, national, regional and global collaboration and funding (Simchi-Levi, Schmidt and Yehua, 2020) Consider the risk of developing political tension locally and regionally Need transparency and accountability in foreign aid management Have special legislation changes for ICT (Simchi-Levi, Schmidt and Yehua, 2020)
8. Policy intervention for economic recovery	Apply microfinancing for Small and Medium Enterprises (SMEs) and self- employments Baker *et al.*, 2020 Build strong coordination between donors and development partners Establish economic recovery along with social justice and decent works (Atkenson, 2020; Buheji *et al.*, 2020; Kohlscheen, Mojon and Rees, 2020; S. Baker *et al.*, 2020) Provide grants and concessional loans to Low- and middle-income countries to give more debt relief for effectively kick-starting economic recovery (Loayza and Pennings, 2020)
9. Supply chain management of goods	Focus on identifying exposure to risk associated with materials and suppliers, prioritizing and allocating resources effectively and investing in mitigation strategies (Armani *et al.*, 2020; Cundell *et al.*, 2020; Novak and Loy, 2020; Rowan and Laffey, 2020)
10. Investment on diagnostic,	Speed up the development of diagnostics, vaccines and therapeutics

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vaccine and medicine	
11. Sustainable and green concept	Boost the economies under sustainable green concept (Williams, 2017; Climate Action Tracker, 2020)
12. Recovery of mental health needs	Fulfil mental health needs in frontline staff and vulnerable groups (J. Lai *et al.*, 2020; Zhang *et al.*, 2020). Build multisector coordination to provide effective services to improve mental health (Wang *et al.*, 2020)
13. Resuming routine health services	Address the need of resuming routine health services (Tabish, 2020; Hunter *et al.*, 2020)
14. Health Promotion	Highlight the need for detailed understanding some risk factors such as smoking and hypertension, shown to be linked with COVID-19 infection in China (Engin, Engin and Engin, 2020)
15. Infrastructure development	Need to escalate the investments in acute care beds and public health capacity (World Health Organization, 2020)
16. Felicitation	Give profound appreciation and due respect to the health workforce (Walensky and Del Rio, 2020)

Policy perspectives for mitigation during the COVID-19 pandemic

Surveillance, epidemiology and lab activity

Surveillance of epidemiological data is a core function in an outbreak investigation. It is necessary to have the correct information at the right time to make informed decisions and actions against the spread of an infectious disease (Nsubuga P, White ME, 2006). Epidemiological characteristics of the COVID-19 such as virulence, infectivity, and basic reproduction number are several key indicators that facilitate decision making at the global and national levels. Enhanced sensitivity of global surveillance and response with real-time tracking and alert systems that are sensitive even for a single case is identified as a priority in the pandemic mitigation including COVID-19 mitigation (Madhav *et al.*, 2017; Desjardins, Hohl and Delmelle, 2020).

COVID-19 is anticipated to coexist with seasonal influenza and expected to result in a surge of cases with seasonal changes in temperate countries (World Health Organization, 2020). Hence, the need to explore the seasonal pattern of COVID-19, in the long run, is a concern in the preparedness of future epidemics.

Literature supported to derive the need for enhanced sensitivity of global surveillance and response system. Real-time tracking and alert system that is active both regionally and globally is one of the actions to prepare (Desjardins, Hohl and Delmelle, 2020). Epidemiological characteristics of the virus such as virulence, infectivity, R0 factors when making decisions at the central level during a pandemic shall be considered as well (World Health Organization, 2020). Another essential perspective summarized from the studies is the need to explore the long term course of the disease to understand the seasonal patterns, population herd immunity, and zoonotic genome changes (World Health Organization, 2020). It is broadly identified as

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a key policy response during the pandemic, where continuous supplies of laboratory test facilities need to be ensured, and regional and international policies for laboratory testing and supply of resources are required (Walker *et al.*, 2020).

Further, the epidemiological factors and the assessment of the likelihood of infection are necessary for decision making related to laboratory testing due to the high transmissibility and the limited knowledge of the virus. The availability of regional and international policies for laboratory testing and measures to ensure the continuous supply of laboratory test facilities is recognized as key findings in the review (Walker *et al.*, 2020).

Community mitigation measures

Community mitigation measures are widely being used to curb the disease spread since there are no specific therapeutics and vaccines available at the moment. Community mitigation measures, e.g., social distancing, personal protective measures, and environmental surface hygiene, and others are commonly being used to slow the virus transmission (Lasry *et al.*, 2020). Technological development, nature of political bureaucracy, level of public compliance for advice and economic status of the country have significantly influenced the decision-making process in the selection of community measures.

The key policy perspectives that have been derived are smart containment and mitigation measures versus lockdown measures (Ebrahim *et al.*, 2020); application of technology for public health measures and social cohesion (World Health Organization, 2020); guidelines issued for the public on the use of Personal Protective Equipment (PPE) (Wong *et al.*, 2020); mitigation measures for international travel (Ebrahim *et al.*, 2020); consideration of human rights aspects for public health measures (Shuja *et al.*, 2020); consideration of political bureaucracy versus social freedom in implementing lockdown strategies (Radwanski and Semeniuk, 2020); respecting social and cultural values during policy development (Crubézy and Telmon, 2020); a strong multisector approach (Chen, Cao, and Yang, 2020); and additional measures to prevent the disease at the workplace (Anderson *et al.*, 2020). Moreover, the articles suggest smart containment measures, i.e, effective personal and public hygiene measures, protection of the most vulnerable group to the disease, isolation of infected people, telephone triaging, and effective referral system, over the lockdown measures in controlling the disease spread, especially in developing countries (Ebrahim *et al.*, 2020).

Political bureaucracy versus social freedom is debatable in the implementation of the lockdown strategies and deemed two sides of a coin (Radwanski and Semeniuk, 2020). Hence, the selection process of the mitigation measures in a particular locality could negatively impact the expected outcome. Maintenance of transparency and trust is essential in preserving a calm response to the public measures. The public compliance depends on social, ethnic, and cultural values during policy development. The need for evidence-based, culture and religion sensitive cremation guidelines has been discussed across many regions (Crubézy and Telmon, 2020).

At the same time, extreme fear and uncertainty are brought by the pandemic (Melinda Smith, 2020), and the implementation of community mitigation measures could invariably result in negative spill over effects such as negative social behaviors, mental health issues, and others in the public, economy, political stability and social security, and become references for future planning of similar epidemics.

The Involvement of military personnel and law enforcement authorities has been observed in some countries to maintain the community discipline during lockdown. Imposing emergency law has

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created social tension in some communities and demanded protection of personal rights. Therefore, the protection of human rights along with adherence to community mitigation measures is highlighted as a future concern in pandemics like COVID-19 (Shuja *et al.*, 2020).

The role of technological applications in disease prevention and mitigation is often discussed during the COVID-19 pandemic. GIS technology, artificial intelligence, and App-based intervention for contact tracing, patient care, and simulation exercises are novel perspectives to be incorporated into existing policies and practices (Drew *et al.*, 2020; Kamel Boulos and Geraghty, 2020). Hence, it is essential that the application of technological innovation is incorporated into future planning, which requires international organizations to carry the process, especially in developing countries.

COVID-19 cannot be tackled alone by the health authorities. A strong and synchronized multisector approach is required with multi-disciplinary policies as its impacts extend beyond the health sector in wider scopes (Chen, Cao, and Yang, 2020).

Further, special guidelines for activities at workplaces, public places, and schools, as well as local and international travel are identified as key policy perspectives to be addressed in mitigating future events in respective nature (Anderson *et al.*, 2020). Some guidelines such as the use of personal protective equipment (Melinda Smith, 2020), i.e., masks and gloves (Paul Glasziou and Mar, 2020) and disinfectant spraying on surfaces (Robert F., 2020) should be addressed early, and necessary guidelines should be available for similar events in the future.

In the recovery phase, the public mobility can be restricted by clustering the population according to the last digit of their National identity card number (The Government Official News Portal, 2020) and by allowing only some clusters to attend the essential services when countries decide on releasing stringent measures in place. Such measures would prevent the resurgence of cases during the pandexit. It is also necessary to maintain the public health standards, i.e., number of passengers in public transport, in reducing exposures and minimizing the spread of the disease.

Medical countermeasures: diagnostic devices, therapeutic, and respiratory devices

When a pandemic begins, it is essential to ensure the continuity of medical supply chains including PPE, ventilator, laboratory testing equipment, and reagents to respond to the surge and transmission phases in the community (Bruinen de Bruin *et al.*, 2020). Common policy perspectives include the continuity of medical supply chains, i.e., PPE, ventilators and laboratory testing equipment and reagents and regional coordination for critical care facilities/offshore Intensive Care Units. Others involve identification of alternative production sites for the production of PPEs, e.g., garment factories, global monitoring mechanism for supply chain. All of these policy perspectives could be considered for planning mitigation of potential pandemic in the future (Bruinen de Bruin *et al.*, 2020; Heymann *et al.*, 2020). Pre-pandemic planning should incorporate mitigation strategies to enhance critical care capacity by improving critical care facilities, i.e., ventilators, ICU beds, and ICU information system. Health systems that are well prepared to face the extreme surge in demand can only be resilient during COVID-19 or in similar pandemics.

Regional coordination of critical care facilities and offshore ICU arrangements are alternative measures to be considered during the pandemic to lessen the overwhelming pressure on the health care systems. Besides, countries should consider all means to increase the

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production and supply of protective equipment by identifying domestic manufacturing facilities or by converting other product lines such as textile sectors into PPE suppliers to countenance the unprecedented demand during the pandemic (Heymann *et al.*, 2020).

Healthcare system preparedness and response

Newly emergent pandemics like COVID-19 have the potential to place enormous strains on the health care system. Effective health system preparedness and response during a pandemic involve the engagement of the entire community and assert to face the increasing demand across all spectrums of care.

Success in response is strongly influenced by the extent to which such pandemics have been assessed in advance and prepared with mitigation measures. Innovative approaches for community triage and referral to healthcare institutions are essential to prioritize the care needs and allocate scarce resources fairly and transparently (Ayebare *et al.*, 2020; Lurie *et al.*, 2020). Moreover, a method such as the identification of population cohorts is indicated and recommended to optimize the resource allocation by considering the impacts of the deases on the population.

The common policy perspectives derived review the healthcare system preparedness and response from public-private partnership in providing services (Parodi and Liu, 2020), transforming health sector from patient-centred to community-centred focus (Nacoti *et al.*, 2020) and leadership styles during the surge of cases (Hammer and Alley, 2020). A special concern should be placed for frontline staff on the supply of PPE and the chance of training especially on CBRN and on screening and diagnostic facilities for healthcare staff to work quickly (Australian Government, Department of Health, 2020). Other policy perspective are essential to look at mental health issues of frontline and key workers and the community (Shuja *et al.*, 2020), reduction of hospital burden and hospital preparedness for surge, and strategies to minimize mobility of cases/patients-aiming to release pressure from hospitals (Litton *et al.*, 2020). Moreover, other key perspectives in the policy making are not limited to innovative approaches for community triage and referral to healthcare institutions (Ayebare *et al.*, 2020; Lurie *et al.*, 2020) and investment in public health infrastructure (Walensky and Del Rio, 2020).

In general, the health care delivery system is focused on providing "patient-centered care", albeit, in pandemics, the attention is drawn towards "community-centered care". It lies beyond the reason that pandemic solutions are imperative for the entire population, rather than for an individual patient (Nacoti *et al.*, 2020). Therefore, policymakers need to pay attention to the barriers that arise during this transition phase and use the knowledge gained for future planning.

The intense dynamic nature of COVID-19 warrants the leaders who are responsible for efficient decision making which aligns with context specifications in responding to the COVID-19 pandemic.

The need for transformation of leadership styles provides more autonomy to local and institutional leaders to take more rational and timely decisions in cluster and community transmission phases due to the overwhelming demand on services (Hammer and Alley, 2020).

Public-private partnership in service provision is widely encouraged to respond to care needs during the pandemic as the demand surpasses the available resources and capacities in the government sector (Parodi and Liu, 2020). The fact of skilled workforce shortage is commonly identified as an urgent need to be addressed during the crisis and soon after. Thus, regular and intensive training for all health care workers is essential to promote preparedness and effectiveness in crisis management. Health authorities

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should maximize the competency of health care workers, especially the frontline staff by organizing "bridge training programs" to match the needs with specific contexts. To maintain a real-time database of the workforce with updated knowledge and skills, human resources need to be trained, and gaps in knowledge and skills are minimized. While a pool of volunteers are required during a crisis.

The risks posed by COVID-19 involve the possibility of infection and deaths. The routine care for chronic diseases and other health needs are interrupted immensely due to the prolonged progression of COVID-19. Hence, the need for inventing new models of care to continue elective care and procedures is suggested. It would reduce the hospital burden and allow hospitals to prepare for surges. Alternatives like mobile clinics and labs, medication supply systems, homecare, and outreach care minimize the virus transmission and release pressure on hospitals (Litton *et al.*, 2020).

Communication and public outreach

Communication is vital between the government and public to raise their awareness of the current situation and to sensitize the public on their role in responding to the pandemic. Communication between the government and public, and especially vulnerable groups is a key policy perspective identified from the previous studies (Heymann *et al.*, 2020; Igoe, 2020; Walker *et al.*, 2020).

However, special communication strategies should be available for vulnerable and high-risk groups, i.e., elderly, minority groups, indigenous groups, patients with comorbidities, and migrants to enhance their awareness of the importance of self-protection by practicing healthy behaviors and to guide them to seek for treatment. It is important to understand the needs of the groups who often face barriers in accessing information, care, and community support and also who are at risk of confronting the secondary impacts of the pandemic in the future planning process (Heymann *et al.*, 2020; Igoe, 2020; Walker *et al.*, 2020).

Scientific infrastructure and preparedness

Research and development should be a vital strand of the government's strategies to mitigate COVID-19 especially as the vaccine and therapeutics development are concerned. These aspects take into account international collaboration, proactive planning and research allocation as key policy perspectives obtained (Li *et al.*, 2020; Li, Liu, and Ge, 2020; Yip *et al.*, 2020).

As COVID-19 is a novel disease entity, it entails a variety of research to answer various questions related to it. The need for research and development for vaccines, viral genome studies, traditional medicine and diagnostics has arrived in a faster timeframe than normal one along with international collaboration, proactive planning, and sufficient resource allocation (Li *et al.*, 2020; Li, Liu and Ge, 2020; Yip *et al.*, 2020).

Domestic and international response, global partnerships, and capacity building

The world is on the brink of public health, economic and humanitarian crises due to the newly emergent pandemic COVID-19. There is an urgent need for policies to show national and international solidarity and government resilience during crises due to the rapid transmission of the disease beyond the borders. A mechanism should be in place to monitor and manage foreign aids during the COVID-19 pandemic, especially in developing countries to demonstrate transparency and accountability.

The common policy perspectives derived from the review are seeking all opportunities for local, national, regional and global collaboration and funding;

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strengthening the central and peripheral integrated care including municipal, provincial, territorial or indigenous jurisdictions; reducing the conflicts of policy implementation and enhancing the smooth running of public health measures; risk of developing political tension locally and regionally; policies for national and international solidarity/government resilience; foreign aid management (Simchi-Levi, Schmidt and Yehua, 2020)

World leaders should collaborate and make concerted efforts to surmount the barriers and accelerate the development, production and equitable global access to essential health care needs and technologies (Simchi-Levi, Schmidt and Yehua, 2020). At this stage, everybody should contribute to minimizing health as well as socio-economic impacts of the pandemic by using the whole of government and society approaches. A collaboration across all sectors is paramount to reduce the conflicts of policy implementations and enhance the smooth execution of public health measures.

Policy perspectives during recovery of COVID-19

In response to the COVID-19 pandemic, a huge spectrum of mitigation measures has been implemented by governments throughout the world. These measures have inevitably resulted in deleterious effects on many sectors notably on the economy (S. R. Baker *et al.*, 2020). Therefore, almost all nations affected by COVID 19 worldwide have taken immediate actions to recover their economic conditions on different scales. Besides, other common policy perspectives found are related to microfinancing for Small and Medium Enterprises (SME); financial support for low and middle-income countries; supply chain management; sustainability through green concept; recovery of mental health needs; resuming routine healthcare services; health promotion; health system infrastructure development, investment on diagnostic, vaccine and medicine; felicitation of healthcare workers.

Microfinancing for Small and Medium-sized Enterprises

Microfinancing for Small and Medium Enterprises (SMEs) and self-employments is a vital urgent area of emphasis in recovery. Wage subsidies, income support to households, cash flow support to businesses, investment incentives, targeted measures for affected regions and industries are some of the principles commonly used by all nations. Further, it has been suggested that governments could transfer emergency health demand to workless households to limit poverty and destitution and keep demand stimulus measures to limit the collapse in the economic activities. However, it is believed that the economic recovery should go hand in hand with social justice and decent work (Atkenson, 2020; Buheji *et al.*, 2020; Kohlscheen, Mojon and Rees, 2020; S. Baker *et al.*, 2020).

Financial support for low- and middle-income countries

Low- and middle-income countries need more debt relief, grants and concessional loans to effectively kick-start economic recovery. However, strong coordination between donors and development partners is the key to recover the economic downfall due to COVID 19 pandemic (Loayza and Pennings, 2020).

Supply chain management

Three different forms of the recovery have been highlighted depending on the length and the magnitude of the pandemic described in three different scenarios (Simchi-Levi, Schmidt and Yehua, 2020) Therefore, supply chain recovery and maintenance are key areas of the economic recovery that should focus on identifying exposures to risk associated with materials and suppliers, prioritize and allocate resources effectively and invest in mitigation strategies including booking

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logistic capacity. Stakeholders should develop their business recovery plans by focusing on affected suppliers and estimating time for recovery, demand, products being affected, and ways of ramping-up with operational planning and sales. However, importantly, the workforce should resume economic activities in blocks with social distancing measures during the pandexit (Armani *et al.*, 2020; Cundell *et al.*, 2020; Novak and Loy, 2020; Rowan and Laffey, 2020).

Sustainability through a green concept

It has been alarmed that all nations will try to boost the economy during the recovery by using more and more organic fuel, which may exacerbate global warming albeit less during the pandemic. Alternatively, governments should boost the economy under a sustainable green concept with reduced greenhouse emissions, especially under alternative energy sources to prevent a similar outbreak in the future (Williams, 2017; Climate Action Tracker, 2020). Besides, high- and middle-income countries have already focused on supporting innovations and enhancing local manufacturing to fight against COVID-19.

Recovery of mental health needs

The need for prompt actions to support and uplift the mental health needs during the pandemic is a common concern during the recovery of this unprecedented event. It is evident that mental health needs are very significant as people start to rebuild lives and cope with the impacts of the pandemic on their communities and livelihoods. Youth, elderly, women, and migrant workers are identified as vulnerable groups to face negative psychological effects during and following the incident, and thus it is required to develop interventions (Qiu *et al.*, 2020). Health care professionals in the frontline, caring for people with confirmed or suspected COVID-19, are vulnerable to mental health problems (J. Lai *et al.*, 2020; Zhang *et al.*, 2020). Implementing mental health precautions parallel to the physical health precautions are essential, especially in low-income countries where scarcity of resources can cause some delays in detecting and managing mental health problems during pandemics. Apart from the mental health needs in health workers, it is required to build multisector coordination to provide effective services to improve the mental health of children (Wang *et al.*, 2020). Government, non-governmental organizations, community, schools and parents are the responsible partners in the process.

Resuming routine health services

It is essential to resume the routine management of chronic diseases, such as diabetes, hypertension, cardiovascular diseases, cancer, and tuberculosis, etc. Such crises have brought many restrictions to the community healthcare-seeking patterns, notably among the vulnerable groups such as elderly with multi-morbidities. Since their movements have been restricted, it is necessary to re-establish regular follow-ups. According to UNICEF, the routine immunizations for kids have been interrupted due to the implementation of social distancing measures, forcing parents to skip the vaccinations (Tabish, 2020). A strong and proactive approach is required for healthcare staff COVID-19 testing during the recovery phase, and thus healthcare staff can return to work quickly. Moreover, the same approach also needs to be applied in the community to detect asymptomatic cases thus preventing a second wave (Hunter *et al.*, 2020).

Health Promotion

We can take this catastrophe as an eye-opener to make changes in our behaviors at the individual and community levels. China is highlighting the need for detailed understanding of some risk factors such as smoking and hypertension, shown to be correlated with COVID-19 infection (Engin, Engin and Engin, 2020).

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Infrastructure development

The need for escalating the investments in acute care beds and public health capacity is identified to make the health system prepared for future incidents. The public health service system needs to be strengthened to address the future events, and the accessibility to health services needs to be improved (World Health Organization, 2020).

Investment in diagnostic, vaccine, and medicine

The world has experienced the biggest public health threat in the form of economic recession after the Spanish flu pandemic in 1918. Scientists have been working at unprecedented speed to develop diagnostics, vaccines and therapeutics for this novel coronavirus (Liu *et al.*, 2020; Pandey *et al.*, 2020).

Felicitation

Profound appreciation and due respect to the health workforce who have dedicatedly worked to care for affected people are essential during the recovery (Walensky and Del Rio, 2020). Not only the health care workers but also other workforces such as military forces, food supply chain providers, and sanitary workers receive felicitation for the selfless work during the pandemic.

Conclusions

In conclusion, this study has identified common policy perspectives that are imperative for the planning of a future pandemic with similar potentials. A tradeoff between stringent and smart mitigation measures was highlighted while observing bureaucracy versus individual autonomy of compliance with the measures. The spillover effects in response to the mitigation measures are deemed vital in planning future pandemic mitigation and recovery strategies. It is essential to understand the long course of the disease to prepare the seasonal variations and to assess the herd immunity of the society. Global and regional resource sharing mechanisms are vital when a universal shortage of healthcare resources occurs. Policy perspectives related to research and development are commonly identified for understanding novel pandemics and effective mitigation measures globally.

Abbreviations

COVID-19: Corona Virus Disease of 2019; SARS-CoV-2: Severe Acute Respiratory Syndrome Coronavirus 2; PPE: Personal Protective Equipment; CBRN: Chemical, Biological, Radiological and Nuclear; ICT: Information and Communication Technology; SME: Small and Medium Enterprise; ICU: Intensive Care Unit; UNICEF: United Nations International Children's Emergency Fund.

Declarations

Ethics Approval and Consent Participant

Not Applicable

Conflict of Interest

The authors declare that they have no conflicts of interest in this study.

Availability of Data and Materials

Data and materials can be provided upon request.

Authors' Contribution

All authors were involved in conceptualizing the article and searching literature. WIUJ drafted the manuscript, and all authors involved in manuscript editing. All authors went through the final manuscript.

Acknowledgment

Not Applicable

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Original Research

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p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.218-225

HAND HYGIENE KNOWLEDGE AMONG HOSPITAL HEALTH WORKERS IN PALEMBANG DURING COVID-19 ERA

Pengetahuan Kebersihan Tangan Petugas Kesehatan Rumah Sakit di Palembang Selama Masa Pandemi Covid-19

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Abstract

Background: Hand hygiene is the simplest practical method of preventing cross-infection. Knowledge of hand hygiene plays a vital role in determining adherence to hand hygiene. Nosocomial infection is an infection that occurs in patients in hospital.
Aims: This study aims to analyze the knowledge of health workers regarding hand hygiene in Palembang hospitals during Covid-19 era.
Methods: This study used a cross-sectional design with 300 health workers who worked in hospitals in Palembang. They are selected by simple random sampling. Data were collected using online questionnaire during October 2020.
Results: The majority of respondents were female (88.67%), with the majority age group 30-39 years (43.67%), the majority of respondent came from nurses (63%), work in inpatient rooms (27.33%). A total of 80.67% of respondents have received formal training related to hand hygiene. 96% used alcohol-based hand rub. About 15.33% of respondents indicated good knowledge, moderate knowledge (80.33%), and less knowledge (4.3%) regarding hand hygiene. The difference in health workers' profession was significantly related to the level of knowledge about hand hygiene (p <0.05).
Conclusion: There are differences in the level of knowledge about hand hygiene in each type of health worker profession

Keywords: hand hygiene, health workers, knowledge, online

Abstrak

Latar Belakang: *Kebersihan tangan adalah metode praktis paling sederhana untuk mencegah infeksi silang. Pengetahuan tentang kebersihan tangan memainkan peran penting dalam menentukan kepatuhan terhadap kebersihan tangan. Infeksi nosokomial merupakan infeksi yang terjadi pada pasien di rumah sakit.*
Tujuan: *Penelitian ini bertujuan untuk menganalisis pengetahuan petugas kesehatan tentang hand hygiene di rumah sakit Palembang di masa Covid-19.*
Metode: *Penelitian ini menggunakan desain cross sectional dengan 300 tenaga kesehatan yang bekerja di rumah sakit di Palembang. Mereka dipilih menggunakan metode simple random sampling. Data dikumpulkan dengan menggunakan kuesioner online selama bulan oktober 2020. Kuesioner yang digunakan diadopsi dari kuesioner World Health Organization (WHO) dan kuesioner pengetahuan untuk petugas kesehatan edisi revisi 2009. Kami membagikan kuesioner melalui media sosial.*
Hasil: *Responden mayoritas berjenis kelamin perempuan (88,67%), usia mayoritas 30-39 tahun (43,67%), sebagian besar responden berasal dari perawat (63%), bertugas di ruang rawat inap (27,33%). Sebanyak 80,67% responden telah mendapatkan pelatihan formal terkait kebersihan tangan, dan 96% menggunakan antiseptik berbahan dasar alkohol. Tentang kebersihan tangan, sekitar 15,33% responden menunjukkan pengetahuan baik, pengetahuan sedang sebanyak 80,33%, dan pengetahuan kurang sebanyak 4,3%. Perbedaan profesi petugas kesehatan berhubungan secara bermakna dengan tingkat pengetahuan tentang kebersihan tangan (P <0,05).*
Kesimpulan: *Adanya perbedaan tingkat pengetahuan tentang kebersihan tangan pada masing masing jenis profesi petugas kesehatan.*

Kata kunci: *kebersihan tangan, pengetahuan, petugas kesehatan, online*

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
Volume 9 No.2 2021 DOI: 10.20473/jaki.v9i2.2021.218-225
Received: (2020-11-30) Revised: (2021-05-24) Accepted: (2021-11-27) Published: (2021-11-28)
Published by Universitas Airlangga in collaboration with Perhimpunan Sarjana dan Profesional Kesehatan Masyarakat Indonesia (Persakmi).

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.218-225

Introduction

Hand hygiene is the most important and influential step to prevent cross-infection in the hospital. Hand hygiene campaigns were implemented as part of the hospitals' infection control program. Hand hygiene can prevent cross-transmission of microorganisms. Nosocomial infection occurs in patients in hospitals and can affect the quality of health services and cause losses in health services worldwide. In addition, it occurs in health workers or can be a source of vectors when there is contact between health workers and patients. (Rothe, Schlaich, and Thompson, 2013).

Based on the data from World Health Organization, about 1,400,000 people were suffering from hospital acquired infection every year. It is estimated to be extremely high prevalence in underdeveloped countries (Al Kadi and Salati, 2012). About 7 in 100 hospitalized patients in developed countries and 15 out of 100 hospitalized patients in developing countries will be infected with at least one nosocomial infection (Nejad *et al.*, 2011; Vincent *et al.*, 1995). The intensive care unit and the neonate are areas at risk for this infection as about 30% of intensive care unit patients have at least one nosocomial infection (Nejad *et al.*, 2011; Vincent *et al.*, 1995).

Transmission of pathogens through healthcare workers' hands is one of the most common modes of transmission of multiresistant organisms and healthcare-related infections (Zabeeri *et al.*, 2016). Hand hygiene is the simplest practical method for preventing cross-infection (Zabeeri *et al.*, 2016). Knowledge of hand hygiene plays an essential role in determining adherence to hand hygiene. Studies related to knowledge hand hygiene have been explored in various settings, including intensive care units (Mahfouz *et al.*, 2017), heart centers (Din, 2014), university hospitals (Amin *et al.*, 2013), critical care units (Mazi *et al.*, 2013), and public hospitals (Al-Tawfiq *et al.*, 2013; Bukhari *et al.*, 2011). The standard mandates that promote hand hygiene compliance, hand hygiene resources must be made available at critical locations, and behavior change must be supported through education, training, monitoring, feedback, and organizational support (World Health Organization, 2016).

Current Covid-19 pandemics is caused by SARS-CoV-2 virus. This disease appeared in Wuhan, China for the first time in December 2019 and has spread to 113 countries and regions outside China currently (Huang *et al.*, 2020). The virus can be transmitted from human to human, including patients to health workers. Continued exposure by patients supports the transmission of infection to healthcare workers, who are at the front-line of the Covid-19 outbreak (Phan *et al.*, 2019). The World Health Organization (WHO) has recommended patients to practice appropriate hand hygiene to prevent the virus transmission. One of the preventive efforts that need to be optimized during the Covid-19 pandemic maintaining proper hand hygiene (Cavanagh and Wambier, 2020). The World Health Organization (WHO) is very helpful to health workers to ask patients to practice appropriate hand hygiene.

Educating health workers about adherence and effective hand hygiene techniques is very important (Mahfouz *et al.*, 2017). Healthcare worker education has a positive impact on improving hand hygiene and reducing healthcare-associated infection. Identifying hand hygiene knowledge will help build capacity in this regard. A study held in Saudi Arabia reported that lack of knowledge was a stong factor associated with poor hand hygiene perfomance & education was efective hand hygiene campaign (Al-Tawfiq *et al.*, 2013).

Palembang is one of the cities in Indonesia which has experienced Covid-19 cases. A public hospital in Palembang reported Covid-19 positive cases with 334 people, with the number of deaths 47 people. The high case of Covid-19 potentially due to the vulnerability of health workers. Hand hygiene practice and knowledge are crucial to prevent this problem. Health workers are one of the important human resources in handling Covid cases. Studies related to hand hygiene knowledge among health workers

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p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.218-225

at Palembang City Hospital are still limited. This research is expected to become a recommendation to improve compliance with hand hygiene in the hospital. This study aims to analyze the knowledge of health workers regarding hand hygiene in Palembang Hospital.

Method

This study used a cross-sectional design. We selected the sample by using simple random sampling. The study sample was health workers in the Palembang city hospital—collecting data through online questionnaires and distributed through social media. Three hundred respondents participated in this research during Covid-19 era. Data were during October 2020 by filling out a google form questionnaire (https://bit.ly/34WIdBe)

The hand hygiene knowledge questionnaire used for data collection was adopted from the WHO questionnaire with the 2009 revised edition of the knowledge questionnaire for health workers. The questionnaire contained questions about participant's age, gender, profession, department, formal training in hand hygiene, 27 multiple choice questions, and "yes" or "no" to assess hand hygiene knowledge. For each correct answer, one point was counted, and incorrect answers were assigned zero. Overall scores were expressed as a percentage, so an overall score of>75% is considered good, 50-74% moderate, and <50% as poor knowledge.

Data analysis were conducted using STATA 12. We provided frequency table of knowledge about hand hygiene in health workers. Quantitative data were summarized as percentages, and then a non-parametric test of significance (chi-square test) was applied on a nominal scale. Person correlation was used with two-tailed p-value and statistical significance was set at <0.05.

Result and Discussion

A total 300 hospital staff completed the questionnaire. The respondents consisted of 189 nurses, 23 midwives, 10 doctors, 13 nutritionists, and 65 technicians. They worked in different units in different hospitals in Palembang. Their units were varied including internal medicine unit, surgery unit, intensive care unit, a mix of medical/ surgical, emergency room, obstetrics, pediatrics, long-term/ rehabilitation, inpatient, outpatient clinics, and other units. Information on the demographic characteristics of the respondents is summarized in Table 1. About 96% of participants stated that they usually used alcohol-based hand rubs for hand hygiene. 80.67% of participants had received formal training related to hand hygiene. Most of participant was female (88.67%), age 30-39 (43.67%), nurse (63%), and placed in inpatient unit (27.33%).

As mentioned in Table 2, about 80.33% of the participants had moderate knowledge about hand hygiene. Around 4.33% was classified as low, and only 15.33% had a good knowledge score.

Table 3 showed bivariate analysis of level of knowledge and the characteristics of health workers. There was a significant difference in the level of knowledge with health professionals (p <0.05). The level of knowledge of hand hygiene for nurses was higher than that of other professions; while the difference was significant (p = 0.042). Conversely, there was no relationship between the level of knowledge with gender (p = 0.738), individual age (p = 0.738), and formal hand hygiene training (p = 0.121).

Transmission of the Covid-19 virus in hospitals is one of the main routes for the spread of 2019 *novel coronavirus* among health workers. However, contact with Covid-19 positive patients can also occur (Araghi *et al.*, 2020). Therefore, hand hygiene is very important for the prevention of Covid-19 among health workers (Malhotra *et al.*, 2020; Pittet *et al.*, 2006). This goal can be achieved by applying an alcohol-based hand rub, washing hands properly with soap and water, and the use of other antiseptic agents (Malhotra *et al.*, 2020).

Some studies have explored that hand hygiene play important role for prevention healthcare association with infection. Hand hygiene is an effective way of controlling nosocomial infections and has a major influence on the incidence of childbed fever. A study reported that hand

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p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.218-225

hygiene among healthcare profesional is the most effective method to prevent healthcare associated infections (KuKanich *et al.*, 2013).

This study aims to analyze the knowledge of health workers regarding hand hygiene in Palembang Hospital. We found that the majority of respondents have moderate knowledge. Similar results were obtained in previous studies (Ghadmgahi *et al.*, 2011; Hosseinialhashemi *et al.*, 2015; Maheshwari, 2014). Based on the distribution of professions, most health workers who have good knowledge are nurses. Some studies reported that perfomance among nurses was better than physicians (Ghabrah *et al.*, 2007; Wetzker *et al.*, 2016). .

Table 1. Demographic characteristics of health workers who filled out a questionnaire on knowledge of hand hygiene (n = 300)

Characteristic	Answer category	Total n (%)
Gender	Male	34 (11.33)
	Female	266 (88.67)
Age	≤29	115 (38.33)
	30-39	131 (43.67)
	40-49	43 (14.33)
	≥50	11 (3.67)
Profession	Nurse	189 (63)
	Midwife	23 (7.67)
	Doctor	10 (3.33)
	Nutritionist	13 (4.33)
	Technician	65 (21.67)
Department	Internal medicine	29 (9.67)
	Surgery	50 (16.67)
	Intensive care unit	12 (4)
	Emergency unit	9 (3)
	Obstetrics	12 (4)
	Outpatient	23 (7.67)
	Inpatient	82 (27.33)
	Isolation	6 (2)
	Nutritionist	16 (5.33)
	Others	61 (20.33)
Training a course about hand washing	Yes	242 (80.67)
	No.	58 (19.33)
Using alcohol-based hand rub	Yes	288 (96)
	No.	12 (4)

Table 2. The comparison of knowledge score according to the participant's characteristics

Hand hygiene knowledge	Total participant	Profession				
		Nurse	Midwife	Doctor	Nutritionist	Technician
Poor	13 (4.33)	6 (46.15)	1 (7.69)	1 (7.69)	0	5 (38.46)
Moderate	241 (80.33)	145 (60.17)	19 (7.88)	7 (2.9)	11 (4.56)	59 (24.48)
Good	46 (15.33)	38 (82.61)	3 (6.52)	2 (4.35)	2 (4.35)	1 (2.17)

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p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.218-225

Table 3. Bivariate analysis of the level of knowledge with the characteristics of health workers

Characteristic	Indicator	Level of knowledge			*p*
		Poor	Moderate	Good	
Gender	Male	1 (2.94)	29 (85.29)	4 (11.76)	0.738
	Female	12 (4.51)	212 (79.70)	42 (15.79)	
Age	≤29	5 (4.35)	97 (84.35)	13 (11.30)	0.738
	30-39	6 (4.58)	101 (77.10)	24 (18.32)	
	40-49	1 (2.33)	35 (81.40)	7 (16.28)	
	≥50	1 (9.09)	8 (72.73)	2 (18.18)	
Profession	Nurse	6 (3.17)	145 (76.72)	38 (20.11)	0.042*
	Midwife	1 (4.35)	19 (82.61)	3 (13.04)	
	Doctor	1 (10)	7 (70)	2(20)	
	Nutritionists	0	11 (84.62)	2 (15.38)	
	Technician	5 (7.69)	59 (90.77)	1 (1.54)	
Attend a training / course about hand hygiene	Yes	8 (3.31)	194 (80.17)	40 (16.53)	0.121
	No	5 (8.62)	47 (81.03)	6 (10.34)	

*p<0.05

Our results show that majority respondent join in the survey was nurses and consisted of midwives, doctors, nutritionists, and technicians as well. They worked in internal medicine unit, surgery unit, intensive care unit, a mix of medical/ surgical, emergency room, obstetrics, pediatrics, long-term/ rehabilitation, inpatient, outpatient clinics, and other units. 80.33% of the participants had moderate knowledge about hand hygiene. Around 4.33% is classified as low, and only 15.33% has a good knowledge score. From the analysis, we found that the average level of knowledge of health workers who have received formal hand hygiene training is better than those who do not, but not significant. This finding is in line with Hosseini's study where training does not affect the level of knowledge (Hosseinialhashemi *et al.*, 2015). This study also revealed a knowledge gap between health workers about hand hygiene. The gap was more visible among technicians, followed by nurses and doctors. The study documented the effect of formal training on hand hygiene knowledge. The study revealed different formal training levels according to profession and gender (Mahfouz *et al.*, 2017). Our results also reported no difference in the level of knowledge in hand hygiene between men and women. The results are the same as several other studies, which reveal that the overall knowledge score does not differ between men and women (Zakeri *et al.*, 2017).

The level of knowledge of hand hygiene for nurses was higher than that of other professions; the difference was significant (p = 0.042). Similar gaps in knowledge of hand hygiene were found among health workers during Hajj. Nurses perform better than doctors (Ghabrah *et al.*, 2007). A study in Saudi Arabia shows that lack of knowledge is a strong determinant of poor hand hygiene performance. Education is a key determinant of an effective hand hygiene campaign (Al-Tawfiq *et al.*, 2013). Table 3 shows the comparison of knowledge score according to the participant's characteristics. We found the disparity of knowlede among health profession. Therefore, we recommend hospitals to increase the knowledge of health workers about hand hygiene based on the type of profession in the hospital which can be carried out through education and training. This may lead to positive perceptions regarding hand hygiene among health workers. WHO also provides the multimodal strategy for

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p-ISSN 2303-3592, e-ISSN 2540-9301
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promoting hand hygiene which can be adopted by hospitals to increase knowledge among health workers. In addition, the hospital can improve strategy for giving motivation, and sanctions to encourage health worker in implementing hand hygiene behavioral.

We assessed the level of hand hygiene knowledge based on the profession with different work units in the hospital. Data collection was carried out in various hospitals to obtain a more representative sample of the sample. But the limitation in this study included our inability to address non-response bias since the study could not provide denominator. Another limitation is the representation of each health worker profession has not been fully achieved. Therefore we recommend this to be explored in future studies.

Conclusion

Our study demonstrate that most of health worker have received formal training related to hand hygiene. Majority nurse have a good level of knowledge regarding hand hygiene. This study reveals gaps in the knowledge of health workers about hand hygiene based on officers' profession. We recommend that hospitals increase the knowledge of health workers about hand hygiene based on the type of profession in the hospital.

Abbreviations

WHO: World Health Organization; OR: Odds Ratio; SARS: severe acute respiratory syndrome.

Declarations

Ethics Approval and Consent Participant

This study has passed the ethics review from the Ethics Review Center of the Faculty of Public Health, Sriwijaya University

Conflict of Interest

We declare that we do not conflict with anyone's interest.

Availability of Data and Materials

The availability of data and materials based on demand from journal and readers

Authors' Contribution

HI conceptualised the study design and article. DS and RAS prepared the original draft of the manuscript.

Acknowledgment

Not applicable

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Original Research

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.124-134

ECONOMIC INSECURITY AND STRESS AS DETERMINANTS OF COVID-19 PREVENTIVE BEHAVIOUR IN DENPASAR

Kerentanan Ekonomi dan Persepsi Stres Sebagai Determinan Perilaku Pencegahan COVID-19 di Denpasar

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Abstract

Background: The COVID-19 pandemic has constituted concurrent public health and economic crises. An inter-correlation between economic and public health impacts due to the COVID-19 pandemic needs to be studied to improve mitigation measures.
Aims: This study identified a correlation of the economic insecurity and perceived stress with adherence to recommended preventive behaviours
Methods: This across-sectional analytic study was conducted to adults in the working areas of East Denpasar Primary Healthcare Center I. Respondents were selected using consecutive sampling and given a self-administered questionnaire. The research variables included demographic characteristics, economic insecurity indicators, perceived stress, and adherence to handwashing, mask-wearing, physical distancing, and limitation on the social gathering. Correlations, linear regressions, and path analyses were conducted using IBM SPSS 23.0.
Results: As many as 161 respondents of which 34.2% males were involved had a mean age of 36.31 (± 7.16) years. Sex, job insecurity, income insecurity, and perceived stress were found as independent determinants in females. Female sex and job insecurity was associated with better preventive behaviours with an adjusted β value of 0.276 and 0.306, while income insecurity and perceived stress had the opposite association with a β value of -0.247 and -0.224.
Conclusion: There are correlations between economic insecurity and preventive behavioural practices during COVID-19. It is suggested that public health policies against COVID-19 cover measures of economic safety nets to improve adherence

Keywords: behaviour, COVID-19, economic insecurity, perceived stress, prevention.

Abstrak

Latar Belakang: *Pandemi COVID-19 merupakan krisis kesehatan dan ekonomi masyarakat yang terjadi bersamaan. Keterkaitan antara dampak ekonomi dan kesehatan masyarakat akibat pandemi COVID-19 perlu dikaji untuk meningkatkan upaya mitigasi.*
Tujuan: *Penelitian ini mengidentifikasi hubungan antara ketidakamanan ekonomi dan stres yang dirasakan dengan kepatuhan terhadap rekomendasi perilaku pencegahan.*
Metode: *Penelitian analitik potong lintang ini dilakukan pada orang dewasa di wilayah pelayanan Puskesmas I Denpasar Timur. Sampel direkrut dengan consecutive sampling dan data dikumpulkan dengan kuesioner yang diisi sendiri. Variabel yang diteliti meliputi demografi, indikator kerentanan ekonomi, persepsi stres, kepatuhan mencuci tangan, pemakaian masker, jarak fisik, dan pembatasan aktivitas sosial. Analisa korelasi, regresi linier, dan analisis jalur dilakukan dengan menggunakan IBM SPSS 23.0.*
Hasil: *Sebanyak 161 responden yang terdiri atas 34,2% laki-laki memiliki usia rata-rata 36,31 (± 7,16) tahun. Jenis kelamin perempuan, kerentanan pekerjaan, kerentanan pendapatan, dan stres yang dirasakan ditemukan sebagai determinan independen. Jenis kelamin perempuan dan kerentanan pekerjaan yang lebih tinggi ditemukan berhubungan dengan perilaku pencegahan yang lebih baik dengan nilai adjusted β masing-masing 0,276 dan 0,306. Sementara itu, terdapat hubungan yang yang berlawanan antara kerentanan pendapatan dan persepsi stres dengan nilai β masing-masing -0,247 dan -0,224.*
Kesimpulan: *Terdapat hubungan antara ketidakamanan ekonomi dan praktik perilaku preventif selama pandemic COVID-19. Penelitian ini menyarankan agar kebijakan kesehatan masyarakat terhadap COVID-19 membahas tentang langkah-langkah dalam jaring pengaman ekonomi untuk meningkatkan kepatuhan.*

Kata kunci*: COVID-19, kerentanan ekonomi, pencegahan, perilaku, persepsi stress.*

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
Volume 9 No.2 2021 DOI: 10.20473/jaki.v9i2.2021.124-134
Received: (2020-12-09) Revised: (2021-04-24) Accepted: (2021-06-15) Published: (2021-11-28)
Published by Universitas Airlangga in collaboration with Perhimpunan Sarjana dan Profesional Kesehatan Masyarakat Indonesia (Persakmi).

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.124-134

Introduction

COVID-19 has been declared a pandemic since March 11th, 2020 although the first cases have been reported in China since late 2019 (WHO, 2020c). The effect of this pandemic has been profound, both as public health and economic hazard. Per November 28th, 2020, there were 60.5 million confirmed cases and 1.4 million confirmed deaths due to COVID-19 (WHO, 2020b). In the same period, more than 500 thousand COVID-19 cases with more than 16 thousand mortalities occurred in Indonesia (COVID-19 Response Acceleration Task Force, 2020). There were also evidence that these figures were underestimation of the real situation (Wirawan and Januraga, 2021).

In response to the pandemic, the WHO have endorsed some forms of health protocols. These protocols mostly include avoiding crowd, physical distancing, hand hygiene, and mask-wearing (WHO, 2020a). In compliance with these endorsements, the Indonesian government also applies the same protocols to prevent COVID-19 transmission (Andriani, 2020).

However, these health protocols result in negative impacts. The COVID-19 pandemic and the health protocols have created financial hardships. The International Labour Organization (ILO) reported 400 million full-time job loss by June 2020 (ILO, 2020) in which service industries were reported to experience the most severe impacts (Bartik *et al*., 2020).

Economic insecurity has previously been found to have a correlation with adherence to COVID-19 preventive behaviour. At the beginning of the pandemic, it has been reported that lower income has been a factor affecting adherence to quarantine protocols (Webster *et al*., 2020).

The deterioration of the mental health has also been an issue during the pandemic. Previous studies have identified correlations between isolation during the quarantine period and financial stress as risk factors of mental health issues including anxiety, depression, and perceived stress (Khan *et al*., 2020; Roy *et al*., 2020).

Two other studies have found mental status in turn was associated with compliance to COVID-19 prevention guidelines. One has also discovered that higher perceived stress was associated with fewer adopted physical distancing measures and perceived compliance, indicating the respondents' awareness of inadequate compliance to prevention guidelines (Tang *et al*., 2020; Zhao *et al*., 2020).

After the pandemic has occurred for more than 6 months in Indonesia, the level of adherence to recommended preventive behaviours still require further evaluation. Results on the levels of adherence are currently varied from low to very high (Triyanto and Kusumawardani, 2020; Wiranti, Ayun Sriatmi, and Wulan Kusumastuti, 2020).

A little attempt is performed to study the correlation between the economic impact due to COVID-19 and the effectiveness of the public health policies. As Indonesia has currently been suffering economic and health crises, it is important to understand how these crises are intertwined. Thus, this study aimed to identify a correlation of economic insecurity and level of perceived stress with adherence to COVID-19 preventive behaviour in adults in Denpasar, Bali, Indonesia.

Method

This study was an analytic cross-sectional study in adults in the working area of East Denpasar Primary Healthcare Centre I in Denpasar city, Bali, Indonesia. Samples were recruited consecutively from a pool of parents attending school-children immunization events from 13th to 26th September. They were given self-administered questionnaires in Indonesian while waiting for their children. The

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p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.124-134

questionnaires were gathered after the events finished.

The immunization event with researcher participation was attended by approximately 300 students, with as much parents in company. The researchers approached 210 potential respondents during data collection, but only 191 respondents returned the questionnaires. Out of these, 30 questionnaires were excluded because they were incomplete. Finally, 161 respondents were included for analysis.

Data on the demographic characteristics, economic impacts, perceived stress, and COVID-19 preventive behaviour were collected. Economic impact indicators included impacts on job and income insecurities. Impacts on job insecurity were measured with four Likert scales which consisted of no impact, working hour and pay cut, temporary loss (furloughed), and termination. Meanwhile, impacts on income insecurity were measured with three Likert scales from no change, mild, and severe income loss.

The level of stress was measured using ten items in the perceived stress scale (PSS-10). The scale consisted of 10 questions with two subscales: stress level and self-confidence in managing current situation. Questions answered with scale 4 would have an overall score ranging from 0 to 30. PSS-10 was a validated questionnaire in Indonesian and was previously used in some other research (Indira, 2016; Purnami and Sawitri, 2019). Cronbach alpha for PSS-10 in this present study was 0.688.

Preventive behaviour was measured with questionnaires previously validated with readability test. The questionnaire evaluated respondents' self-reported behaviour on four recommended preventive behaviours, namely social distancing, mask-wearing, handwashing, and physical distancing. Each question was answered in five Likert scales ranging from 'never' to 'very often' which corresponded to scores from 0 to 4. Inverse scoring was employed for social gathering indicator in which the respondents could answer 'never' that corresponded to score 4 while they could answer 'always' meaning 0.

The level of adherence was measured by a mean score of these four questions and classified into three groups: adequate (a mean score of 3 or more), inadequate (a mean score of 2 to 2.99), and severely inadequate (a mean score of less than 2). This study used bivariate correlation, multivariate regression, and path analyses in IBM SPSS 23.0.

Result and Discussion

There were 106 (65.8%) females and 55 (34.2%) males participating in the present study. The mean age was 36.31 (± 7.16) years. Most of the respondents (49.1%) finished high school although a significant number of respondents finished higher education (Table 1).

The majority of the respondents reported a detrimental impact on employment and income due to COVID-19 pandemic and its associated health protocols. Only 45 (28.0%) respondents reported no change in employment while nearly half reported hours and pay cut. From the income aspect, only 26 (16.1%) reported no change, and 102 (63.4%) respondents reported a severe loss. The mean PSS-10 score was 16.11 (± 5.69).

Out of 161 respondents, the mean preventive behaviour score was 12.93 (± 1.54). Most of the respondents answered 'very often' on the frequency of handwashing (63.4%), mask-wearing (81.4%), and 1-meter physical distancing in the public places (54.7%). However, most of them still reported 'occasional' social gathering (75.8%). Overall, the majority (82.6%) had adequate preventive behaviour.

Overall, the results indicate adults in Denpasar had good COVID-19 prevention practice which can be seen from the preventive behaviour score and the exceeding threshold score. However, there were few that had inadequate (16.8%) and even severely inadequate preventive behaviour (0.6%).

The majority also reported 'often' or 'very often' to practice handwashing and mask-wearing. However, only a little more

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p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.124-134

Table 1. Sociodemographic characteristics of the respondents.

Variables	
Sex, n (%)	
Male	55 (34.2)
Female	106 (65.8)
Age (year), mean ± SD)	36.31 ± 7.16
Education, n (%)	
Below elementary school	2 (1.2)
Elementary school	7 (4.3)
Middle school	24 (14.9)
High school	79 (49.1)
Associate degree	21 (13.0)
Bachelor degree	25 (15.5)
Post-graduate	3 (1.9)
Employment insecurity, n (%)	
No change	45 (28.0)
Hours/pay cut	79 (49.1)
Temporary furlough	31 (19.3)
Termination	6 (3.7)
Income insecurity, n (%)	
No change	26 (16.1)
Mild income loss	33 (20.5)
Severe income loss	102 (63.4)
PSS-10 score, mean ± SD	16.11 ± 5.69
Preventive behaviour score, mean ± SD	12.93 ± 1.54
Preventive behaviour, n (%)	
Adequate	133 (82.6)
Inadequate	27 (16.8)
Severely inadequate	1 (0.6)

than 50% reported 'very often' to practice physical distancing in 1-2 meters, and more than three quarters reported 'occasional' social gathering. This indicates although the respondents tried to adhere to mask-wearing and hand washing, physical distancing and avoiding the crowd were more difficult to implement.

Previous results imply that compliance with recommended preventive behaviours varied between places and time. Results from studies in North America and Europe show a different level of adherence to preventive behaviours. For example, 83.1% of the respondents avoided social gathering while 65.5% maintained 2-meter physical distancing (Coroiu *et al*., 2020). A study conducted in Ghana has contradictory results that 90% of the respondents complied with physical distancing in public transport but mask-wearing which only 16% of them practiced (Dzisi and Dei, 2020).

Some previous studies on compliance with COVID-19 health protocol in various regions in Indonesia have shown various results. Two studies in Depok, West Java and Klaten, Central Java have found different results. In Depok, West Java, only 55.8% of the respondents had good preventive behaviours although the categorization of the behaviours was not clear enough (Wiranti *et al*., 2020). The other study in Klaten, Central Java, shows similar results to the present findings (Disemadi and Handika, 2020).

Table 2. Correlation matrix between variables.

	1	2	3	4	5	6
1. Preventive behaviour	1					
2. Age	0.024	1				
3. Education	0.005	0.137^{+}	1			
4. Job insecurity	0.021	-0.080	-0.126	1		
5. Income insecurity	-0.178*	-0.013	-0.239**	0.606**	1	
6. Perceived stress	-0.179*	-0.127	-0.237**	0.318**	0.348**	1

$^{+}$p < 0.1; *p < 0.05; **p < 0.01

Table 3. Multiple linear regression for preventive behaviour scores.

Variables	β	B	95% Confidence Interval		p
			Lower	Upper	
Age	0.117	0.025	-0.007	0.057	0.126
Sex, female	0.276	0.892	0.407	1.377	< 0.001**
Education	0.010	0.014	-0.190	0.218	0.895
Job insecurity	0.306	0.594	0.243	0.945	0.001**
Income insecurity	-0.247	-0.500	-0.876	-0.123	0.010*
Perceived stress	-0.224	-0.060	-0.103	-0.017	0.006**

$^{+}$p < 0.1; *p < 0.05; **p < 0.01

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p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.124-134

Compliance with handwashing and mask-wearing was high (more than 70%), while very least respondents practiced the advice of stay-at-home. However, the study did not report on compliance with physical distancing in public places (Disemadi and Handika, 2020). A study conducted from March-April supports the present findings on compliance with handwashing and mask-wearing but shows different results on compliance with physical distancing which was only practiced by around a half of the respondents (Triyanto and Kusumawardani, 2020).

Based on the method and respondent characteristics, some cautions might apply in generalizing the results. Due to the geographic limitation, the results would be most appropriately generalized to residents in Denpasar. The respondents were just limited to parents with children enrolled in elementary schools, excluding adults without children in elementary school.

Finally, the data show an even distribution of both age and education. However, compared to the demographic profile of Denpasar, the median age of the respondents was slightly higher, and the distribution by sex was more dominated by females (Denpasar City Department of Health, 2019).

The results of Spearman's correlation analysis for ordinal variables of preventive behaviours and independent variables which shows a significant correlation of income insecurity and stress with frequency of handwashing and physical distancing practices (Table 2). Higher income insecurity was correlated with less frequent handwashing and physical distancing practices with Spearman's rho of -0.185 and -0.167, respectively. Similarly, higher perceived stress was significantly correlated with less frequent handwashing and physical distancing with Spearman's rho of -0.220 and -0.190. A less significant and weaker correlation was found between higher education level and more frequent mask-wearing with Spearman's rho of 0.135 ($p = 0.085$).

Table 3, the diagonal, displays a correlation matrix between variables. A Spearman's non-parametric correlation was employed for all pairings because most of the variables were ordinal. The only two numeric variables were PSS-10 and preventive behaviour scores which had non-normal distribution. The result shows two variables were correlated significantly with preventive behaviour scores, namely income insecurity and stress. Higher levels of income insecurity and stress were correlated with lower adherence to COVID-19 preventive behaviours with Spearman's rho of -0.178 and -0.179, respectively.

There was also an inter-correlation between education level, job insecurity, income insecurity, and stress. Income insecurity was negatively correlated with education level but positively correlated with job insecurity with Spearman's rho of -0.239 and 0.606, respectively. Perceived stress was significantly correlated with education, job and income insecurities. Higher education level was associated with lower perceived stress while higher job and income insecurities were correlated with higher perceived stress with Spearman's rho of -0.237, 0.318, and 0.348, respectively.

Further multiple linear regression discovers more independent correlations between independent variables and preventive behaviour scores. As shown in Table 3, variables independently associated with preventive behaviours were sex, job insecurity, income insecurity, and stress level. Female sex and higher job insecurity were independently associated with better preventive behaviour practices with an adjusted β value of 0.276 and 0.306, respectively. Higher-income insecurity and perceived stress, on the other hand, were associated with lower adherence with an adjusted β value of -0.247 and -0.224, respectively.

However, despite the significant association between independent variables and preventive behaviour scores, only job insecurity was significantly associated with the likelihood of adequate preventive behaviour with an OR value of 6.39 (95% CI 1.248 – 32.739).

A less significant correlation was found between income insecurity and stress level. The respondents who

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p-ISSN 2303-3592, e-ISSN 2540-9301
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reported severe income loss and higher PSS-10 score were less likely to show adequate preventive behaviours with OR of 0.189 (95% CI 0.028 – 1.253) and 0.925 (95%CI 0.850 – 1.008), respectively.

Further path analysis, as shown in Figure 1, explains how education, economic insecurity, and perceived stress interrelate each other in determining the practice of COVID-19 preventive behaviours. Apart from its direct correlation with preventive behaviour, job insecurity was an independent determinant of income insecurity and become a determinant of preventive behaviour. Similarly, income insecurity was also an independent determinant of perceived stress. On the other hand, education level, which was not a direct independent determinant of preventive behaviour, was an independent determinant of income insecurity.

The results imply correlations between economic impacts due to COVID-19 pandemic and reported preventive behaviours. Furthermore, an independent association occurred between sex, economic impacts, and stress level with overall adherence to preventive behaviour recommendations. The level of education, economic impacts, and stress level were interrelated as shown in Figure 1.

Previous results also highlight perceived impacts of COVID-19 prevention, such as difficulties in providing basic needs, performing work, having entertainment, and building social relations (Andayani, 2020). Some studies have reported on the impacts of COVID-19 pandemic and constraints in the aspects of employment and income (Gupta *et al*., 2020; Spurk and Straub, 2020). Another previous study points out mental health problems due to the COVID-19 pandemic and social distancing (Park *et al*., 2020).

While other studies reveal socioeconomic status, including levels of income, education, and employment, was correlated with preventive behaviours (Irigoyen-Camacho *et al*., 2020; Zhong *et al*., 2020). To support the findings, this present study further gives evidence on the direct association between economic impacts and adherence to preventive behaviour recommendations.

Current evidence used variables that better describe a current level of socioeconomic status, such as current employment and current income levels. While these variables were correlated with adherence to COVID-19 prevention practices, the current levels of income and employment were fundamentally different from sudden economic insecurity. Some people may currently have a low level of income, which did not change during the COVID-19 pandemic. Some low-income respondents such as retail workers can be categorized under this category. Meanwhile,

Figure 1. Estimated path model for determinants of COVID-19 preventive behaviors.
Note: *p < 0.05; **p < 0.01

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p-ISSN 2303-3592, e-ISSN 2540-9301
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sudden economic changes may cause middle-income workers to lose their jobs and income or to face pay cuts.

This distinction between current economic status and change during the COVID-19 pandemic should be emphasized. People nowadays face different day-to-day challenges during the COVID-19 pandemic. Worker with low income may face less financial stress as they will not be affected that much but face more about the COVID-19 infection. Meanwhile, those facing income loss may face financial stress as they may become untenable under the current low economic situation. These different challenges may reflect different behaviours in facing the COVID-19 threats. Unfortunately, however, the current data examined could not reflect these differences as available data were about changes due to COVID-19 in terms of economic security without a baseline.

Results from the previous analysis corroborate the notion that mental health was affected not only by severe poverty but also socioeconomic degradation due to the recession. Systematic reviews of studies conducted around 2007-2009 conclude increased perceived stress and depression in people experiencing layoffs in terms of income loss and financial stress. However, those who remained at work were under pressure, stress, and depression due to increased workload due to a loss in the number of workers and fear of employment loss and pay-cuts (Frasquilho *et al*., 2016; Mucci *et al*., 2016).

Some recent studies corroborate these earlier findings. Financial stress pandemic and constraints during the COVID-19 may negatively impact one's mental health. Figure 1 shows that income insecurity during the COVID-19 pandemic is the sole independent determinant of stress level among the respondents. The previous results support other studies finding financial stress, loss of income and career setback due to COVID-19 became significant sources of psychological stress (El-Zoghby *et al*., 2020; Restuborg *et al*., 2020). This condition applies to people employed in service and entertainment industries (Khan *et al*., 2020) as the population in the present research took place in Denpasar, Bali, a well-known tourism hub.

Mental health issues, including fear of COVID-19 infection and financial stress, negatively affected adherence to preventive behaviours. Another previous study further claims that perceived stress was negatively correlated with preventive behaviour practices among healthcare workers (Tang *et al*., 2020). Among the population in China, higher perceived stress was correlated with less frequent COVID-19 prevention practices (Luo *et al*., 2020).

In line with the previous research findings, someone experiencing more stress and anxiety would behave less cautious by neglecting preventive behaviour. Excessive stress and anxiety may lead someone to have negative coping mechanisms. Someone with somewhat stress and anxiety may be more cautious and aware, but they may not care enough when the stress level exceeds a certain level and thus makes them have negative coping mechanisms, such as denial of preventive behaviours (Luo *et al*., 2020).

This present study has also found a direct independent correlation between economic insecurities and preventive behaviours, as shown in Figure 1. Other studies support the results by saying that job insecurity was positively correlated with preventive behaviours (Li *et al*., 2020; Tang *et al*., 2020). The correlation may occur as non-working people would have fewer chances to engage in activities outside. Another study, on the other hand, explains income insecurity was negatively correlated with preventive behaviour (Irigoyen-Camacho *et al*., 2020). Income loss may discourage people to adhere to preventive behaviours as those who have income can provide their basic needs (Webster *et al*., 2020).

The previous results imply that policy-making was somewhat shaped by the belief that conducting an effective public health intervention against COVID-19pandemic encourages the government to sacrifice economic wellbeing, at least for a short term (Guest, del Rio, and Sanchez, 2020). The present results show

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p-ISSN 2303-3592, e-ISSN 2540-9301
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differently by stating that public health interventions, especially relying on compliance with behavioural changes, would be ineffective when public priority relies not only on maintaining the public health but also securing public finances. In other words, public health policies should balance the effectiveness by maintaining economic stability.

Similar recommendations have been expressed previously based on the COVID-19 management in Vietnam. However, the country needs to maintain societal and political stability more (Tran *et al*., 2020). The present results provide more evident of the economic impacts during the COVID-19 pandemic, that will only be milder when the public health interventions are effective enough to control the pandemic itself. With vaccine rollout, it would also be interesting to see how these factors affect vaccine acceptance as there have been evidence that distrust in government was a barrier to vaccine acceptance (Wirawan *et al*., 2021).

At the end, this study emphasizes that behaviour science is complex, and predicting determinants for certain behaviours require more variables than what are available in this study. More variables, such as attitudes, beliefs, and other psychological measures, are proven to get correlated with COVID-19 preventive behaviours although they are not accounted for in this study.

Conclusion

Economic insecurity during the COVID-19 pandemic had a correlation with its public health protocols to prevent the transmission among the population in Denpasar, Bali, Indonesia. Job and income insecurities were as the independent determinants of preventive behaviours, along with perceived stress and sex. The path modelling further shows education as an indirect determinant of income insecurity.

The results imply responses to the COVID-19 pandemic should not focus on mitigating the transmission in a tunnel vision. Instead, these should balance economic stability to enhance the effectiveness of public health interventions, especially relying on public behavioural changes.

Abbreviations

WHO: World Health Organization; SD: Standard Deviation; COVID-19: Coronavirus Disease of 2019; PSS: Perceived Stress Scale; Puskesmas: Pusat Kesehatan Masyarakat; OR: Odds Ratio.

Declarations

Ethics Approval and Consent Participant

All respondents have given informed consent forms for their participation in this study. Those who agreed to join were required to sign the forms. During the data collection, the researchers were standby to provide any additional information of the research procedures if necessary. Respondents were free to cancel their participation at any time. This study has obtained an ethical clearance from Faculty of Medicine, Udayana University/ Sanglah General Hospital Ethics Commission (No. 2230/UNUN.14.2.2.VII.14/LT/2020).

Conflict of Interest

The authors declare that there is no significant competing financial, professional, or personal interests that might have affected the reporting of results in this study.

Availability of Data and Materials

Data and material research can be provided upon reasonable request to corresponding author.

Authors' Contribution

GBSW conceptualized the study and created the methodology; TAPT, DAADA, MADPL, NMAM, and PPJ wrote, reviewed, and edited the manuscript; GBSW wrote the original draft.

Acknowledgment

We would like to thank dr. Yanto Hartanto and other medical staffs in Puskesmas I Denpasar Timur, for their support and all the respondents who participated in this study.

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p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.124-134

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Original Research

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p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.191-201

PHYSIOTHERAPY SERVICE WITHOUT STANDARDIZED OPERATING PROCEDURES FROM PHYSIOTHERAPIST'S PERSPECTIVE: A CASE STUDY

Pelayanan Fisioterapi Tanpa Prosedur Operasional Standar dari Perspektif Fisioterapis: Sebuah Studi Kasus

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Abstract

Background: Treatment variations have been considered as a sign of an inappropriate healthcare service whether due to the underuse or the overuse of resources. To reduce these variations, establishing and implementing well-developed standardized operating procedures (SOPs) and evidence-based standardized clinical guidelines is required. A rehabilitation unit for children with disabilities in Makassar did not implement any SOPs or standardized clinical guidelines in their service and treatment. This conduct may have an adverse effect on physiotherapists' professionalism.
Aims: The study aimed to explore the possible impact of community-based rehabilitation (CBR) practice with no SOPs and evidence-based standardized clinical guidelines on the physiotherapists.
Method: This study was a qualitative case study. The CBR unit was observed for 278-hours and the study conducted three semi-structured interviews. Three physiotherapists voluntarily participated in the study. Open, axial, and selective coding were conducted to encode the interview findings. The findings from observation encoded interview, field, and self-reflective notes were triangulated, analyzed thematically, and illustrated by the explorative model.
Results: Working with no SOPs and guidelines was associated with variations in procedures by physiotherapists, irregularity in their treatment choices, liability feeling toward errors making, and Low self-confidence in their professionalism.
Conclusion: Working without SOPs and guidelines was associated with psychological exertion of the physiotherapists. They showed uncertainty in their professional capabilities as a physiotherapist. It is recommended for YPAC Makassar city to develop SOPs and evidence-based standardized clinical guidelines for their organization.

Keywords: children, community-based rehabilitation, disability, guidelines, standard-operating procedure

Abstrak

Latar Belakang: *Variasi pengobatan telah dipertimbangkan sebagai salah satu tanda pelayanan kesehatan yang tidak layak. Salah satu cara untuk mengurangi variasi tersebut adalah dengan menyusun dan mengimplementasikan sebuah prosedur operasional standar (SOP) dan panduan standar klinis berbasis evidens. Sebuah unit rehabilitasi berbasis komunitas (CBR) untuk anak-anak dengan disabilitas di kota Makassar tidak mengimplementasikan SOP dan panduan standar klinis berbasis evidens dalam memberikan pelayanan dan pengobatan pada klien mereka.*
Tujuan: *Tujuan dari studi kasus ini adalah untuk mengetahui dampak yang mungkin terjadi pada sebuah praktik rehabilitasi berbasis komunitas tanpa SOP dan panduan standar klinis pada fisioterapis.*
Metode: *Studi ini adalah studi kasus kualitatif. Unit CBR diobservasi selama 278 jam dan melakukan tiga wawancara semi terstruktur. Tiga orang fisioterapis bersedia menjadi partisipan studi ini. Teknik pengkodean terbuka, aksial, dan selektif digunakan untuk mengkodekan hasil temuan wawancara. Temuan dari observasi, interview yang di-coding, catatan lapangan, dan refleksi diri ditriangulasikan dan dianalisis secara tematik. Model eksploratif yang mengilustrasikan empat temuan kunci dibuat.*
Hasil: *Fisioterapis secara umum mengkhawatirkan prosedur dan penanganan yang bervariasi, ketidaktentuan dalam pemillihan terapi, rasa bersalah ketika membuat kesalahan, dan kurang rasa percaya diri sendiri terhadap profesionalisme mereka.*
Kesimpulan: *Bekerja tanpa SOP menyebabkan beban psikologis bagi fisioterapis. Mereka mengekspresikan kecemasan dengan mempertanyakan kapabilitas profesional mereka sebagai fisioterapis. YPAC Makassar direkomendasikan untuk mengembangkan secara khusus sebuah SOP dan panduan standar klinis sesuai tujuan organisasi mereka.*

Kata kunci: *anak, disabilitas, panduan, prosedur operasional standar, rehabilitasi berbasis komunitas*

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
Volume 9 No.2 2021 DOI: 10.20473/jaki.v9i2.2021.191-201
Received: (2020-12-29) Revised: (2021-04-19) Accepted: (2021-08-16) Published: (2021-11-28)
Published by Universitas Airlangga in collaboration with Perhimpunan Sarjana dan Profesional Kesehatan Masyarakat Indonesia (Persakmi).

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.191-201

Introduction

Disable people in developing countries live in stigmatization and poverty and have limited access to rehabilitation services (Achu *et al.*,2010). Therefore, World Health Organization established community-based rehabilitation (CBR) which is an approach to facilitate healthcare and rehabilitation for disabled people in developing countries (World Health Organization, 2010). More than 90 countries in the world are developing their CBR units which are mostly organized by non-profit organizations targeting the poor disabled individuals.

CBR units in Indonesia have been operating for 28 years, mainly in Java, Sumatra, and Sulawesi Island (Comcec Coordination Office, 2016). Disabled Children Development Foundation or Yayasan Pembinaan Anak Cacat (YPAC) is the oldest CBR unit for disabled children in Indonesia. Now, YPAC has 16 branches throughout Indonesia, including Makassar city. The mission of YPAC is to support Indonesian children with physical disabilities (Jonathan, 2002). The aids and services include mobility aid devices, rehabilitation, and consultation; however, rehabilitation is not provided anymore by the ongoing national CBR units. Therefore, YPAC is considered the primary support for low-income families of disabled children in Indonesia (Primadi and Budijanto, 2014).

A previous study showed that the recent unit does not rely on standardized operating procedures (SOPs) or evidence-based standardized clinical guidelines (Karnadipa and Nurfikri, 2020). This condition created wide variations in rehabilitative treatment and practice (Naylor *et al.*, 2019). As a consequence, the patient may not receive the most appropriate treatment along with the limited resources. Chaves et al. (2020) presented that this situation may reduce income and healthcare services efficiency. However, based on our literature review, no previous study evaluated the impact of variations on the Indonesian CBR units, especially for physiotherapists.

Minimizing inappropriate variations, especially in treatment choices, is one of the prudent healthcare principles. Variations have been considered an indication of improper healthcare services associated with underuse or overuse of resources (Woolf *et al.*, 1999). To reduce the variations, the development and implementation of evidence-based guidelines are needed for higher clinical outcomes and more consistent healthcare services (Woolf *et al.*, 1999; Fakhry *et al.*, 2004; Arabi *et al.*, 2010; Shafi *et al.*, 2014).

Based on this background, this study aimed to analyze the impact of variations in a CBR unit with no standardized operating procedures or evidence-based standardized clinical guidelines on the physiotherapists. Thus, the study would target a CBR unit to show the influence of practicing without standardized operating procedures or clinical guidelines on their healthcare workers.

Method

This study was a qualitative case study conducted from May to October 2019. Data were collected through observation and semi-structured interviews. This study was conducted at the CBR unit at the physiotherapy department in YPAC Makassar city. A research permit was obtained from the head of the department to evaluate the healthcare delivery. The researcher was a female physiotherapist with four years of experience. She volunteered to be a physiotherapist in this unit from 2015 to 2016. She spent most of her life in Makassar city in Indonesia.

The study used purposive sampling. The inclusion criteria included having one year of experience at YPAC Makassar city and approving for the informed consent. Three female physiotherapists voluntarily agreed to participate. The ranged age of participants was 25 to 29 years with an average of 27 years old. All of the participants had national licenses and two years of experience at YPAC Makassar city. The informed consent contained the research objectives, protocols, benefits, potential risks, and ethical tenets. All therapists' inquiries were answered before the consent agreement.

The unit was observed intensively for 278 hours (6 to7 hours in a day for 40 days)

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from May to July 2019. The observations were recorded. The researcher participated as a physiotherapist and wrote self-reflective notes to minimize any possible observer bias. The observation procedure included the services and interaction process between physiotherapists, children, and parents. Moreover, the errors contributing factors to rehabilitative service were observed, analyzed, and categorized. A fishbone chart was used to illustrate the relationship between the contributing factors. The findings were synthesized in a systematic and structured approach (Cleland, Habli and Medhurst,2012). However, the article only discussed the procedural factors related to SOPs and clinical guidelines.

Three semi-structured interviews were conducted from September to October 2019 for 60 minutes. The participants were interviewed to get all possible information. The respondents' identities were anonymized for confidentiality purposes. The interviews were conducted using Bahasa Indonesia and audiotaped with a tape recorder. Their facial expression and behaviors during the interview were directly documented after the interview. Then, the interviews were recorded, transcripted verbatim, and inductively analyzed (Streubert and Carpzenter,2011).

The interviews transcriptions were coded through a series of open coding, axial coding, and selective coding. In open coding, the transcriptions were scanned line-by-line and coded by category. In axial coding, the transcriptions were coded and subcategorized regarding SOPs and clinical guidelines, then thematically arranged, compared, and inductively analyzed. Next, an explorative model was synthesized. After that, the transcriptions were translated into English and proofread by an English Translator. Finally, in selective coding, the final preposition was synthesized after rationalized the findings from both observation and structured interviews. To minimize the bias due to the researcher's assumptions, self-reflective notes were evaluated and findings were sent to the participants to get their confirmation and feedback.

The findings were analyzed and discussed. Practical recommendations were created at the three levels of the external analysis.

Results and Discussion

The results showed that the physiotherapy CBR unit received clients from Monday to Saturday from 9:00 Am to 12:00 Pm. The unit room size was 16x24m located at YPAC Makassar city. The unit equipment consists of four mattresses, two standing frames, a three-millimeter parallel bar, a stair set, a wall bar, a leg exercise table, two half-circle-shaped cushions, and four U-shaped cushions. It also contained sets of arm, leg, ankle, and thoracic orthosis, some were donated by previous clients. The equipment was sufficient to cover the demand of the children including children more than eight years old during the rehabilitative interventions. However, the equipment was not enough to treat more than three children in one session.

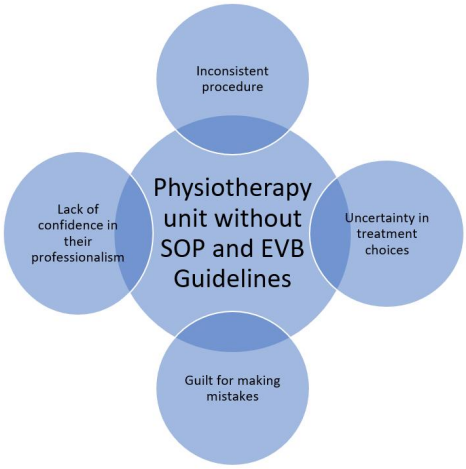

Figure 1. An explorative model illustrated consequences experienced by the physiotherapists working without SOPs and standardised clinical guidelines

The unit was officially operated by three physiotherapists on daily basis. Their expertise ranged from two years to more than ten years in pediatric rehabilitation service. Students from two local physiotherapy and nursing schools were assigned to the unit for internships of supervised practice in a certain period with a shift of one to three months. Their main tasks were to assist the therapists in providing essential therapy and healthcare for children. The unit showed neither

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p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.191-201

standardized operating procedures (SOPs) nor evidence-based standardized clinical guidelines. The junior physiotherapists provided treatment according to their senior therapists' instruction, and their previous training, experience and academic knowledge. Most visitors were from the South Sulawesi Province and other Eastern Indonesia provinces, according to their parents' origin. The unit targeted children and young people with physical disabilities or developmental delays. The most common clinical case was cerebral palsy.

The unit has unscheduled appointments associated with an inconsistent number of clients per week. On some days, the number was high treating seven children at the same time, while on other days, it was low treating three children in the whole day. The senior physiotherapists guided the junior physiotherapists and students during the interventions. The treatment was based on academic knowledge showing no application of daily guidelines or SOPs.

The rehabilitation service may show significant errors at all healthcare system levels especially the last level (Vincent,2008). The human factors significantly have adverse effects. Thus, a fishbone chart was conducted to define and analyze these factors (Cleland, Habli, and Medhurst, 2012). The chart identified some factors including fatal ones (Figure 1).

All participants were female physiotherapists. The range of age was 25 to 29 years with an average age of 27 years old. They were nationally licensed as physiotherapists and had two years of working experience at YPAC Makassar city.

The explorative model shows the consequences of working without SOPs or guidelines in the CBR unit (Figure 2). These consequences include inconsistent procedures, uncertain treatment choices, high mistakes liability, and low self-confidence of physiotherapists. The lack of tracking standardized pathways was associated with service delivery variations. Thus, the risk of service delivery errors increased causing confusion and insecurity feelings within the physiotherapists.

Variations in procedures and treatment

The variations mainly occurred in the physiotherapy management and administration department. The administration process and payment were not admitted to the parents in the first visit with no further clarification from the parents. However, some administration process was applied on the second visit using paper forms.

The administration process could be postponed in the absence of the charge senior physiotherapist. The process involved scheduling the visits and establishing payments using a computer database for electronic data.

> *Therapist A said, "When a new patient comes, a therapist who is in charge does not discuss the administration process and payment." – P3*
> *"The therapist (who is in charge of administration) is sometimes not available" – P4*
> *"The parents do not usually ask about the payment. They mostly know after a few visits." –P5*

The physiotherapists did not know the exact delivery information to parents, besides the absence of any regulating SOPs or communication guidelines in the unit. Thus, the parents received variant information from the physiotherapists. However, the parents' characteristics may play a prominent role in that diversity.

> *Therapist C said, "We need to be smart on dealing with a particular situation. We need to choose carefully the appropriate words during communicating with the parents."–P12*

> *"Additionally, we need to pay more attention to the parents since most of parents are sensitive."–P13*
> *"Overall, the primary problem is the complications due to the lack of standardized operational procedures."–P14*

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p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.191-201

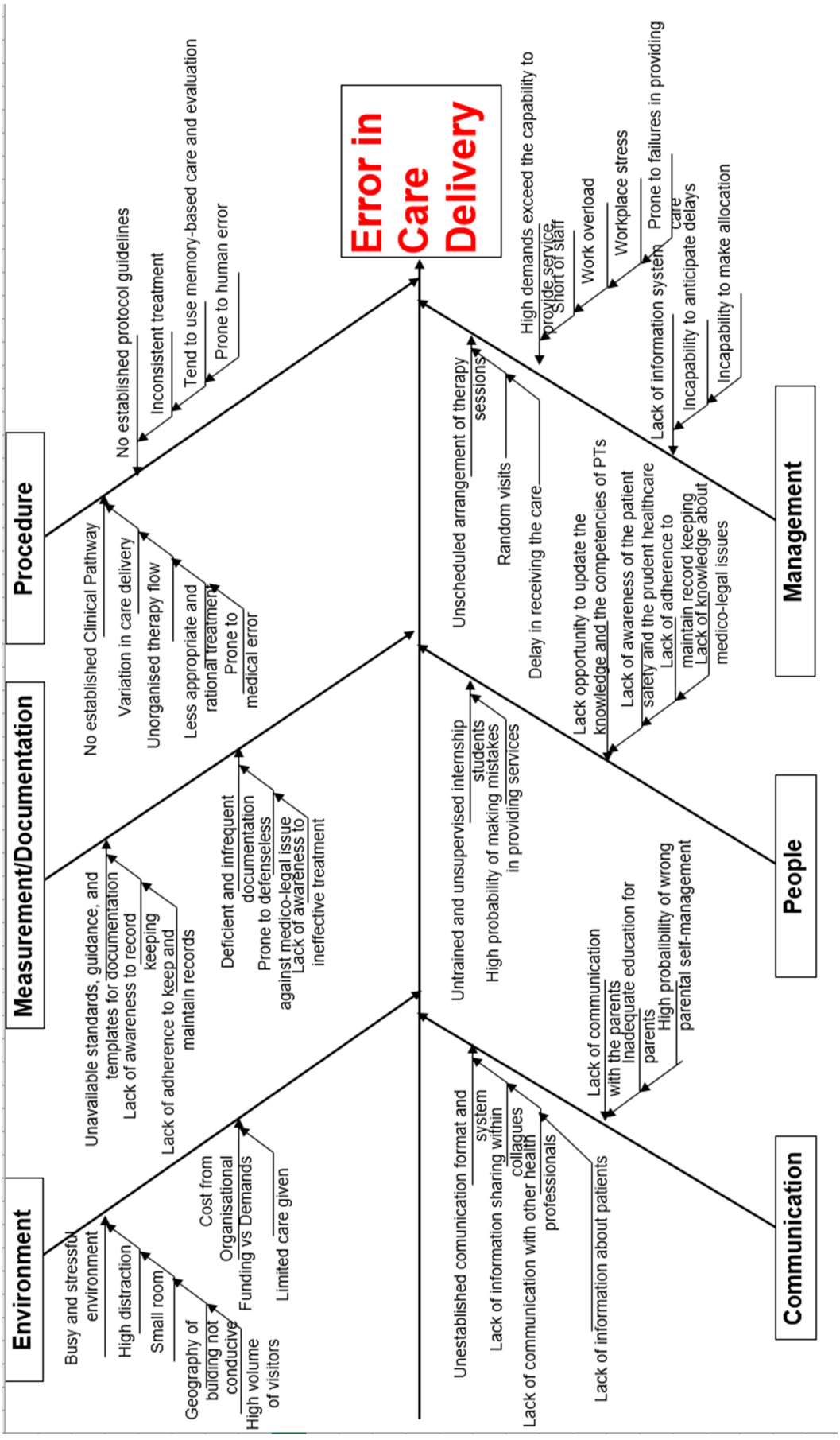

Figure 1. Analysis of the causes of error in the delivery of physiotherapy care in a CBR for children with disabilities in Makassar city using Fishbone diagram

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
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The absence of both SOPs and standardized clinical guidelines was associated with non-consistent information and unclear administration processes which complicated both decision-making and information delivery by physiotherapists to the parents.

The absence of standardized operating procedures or clinical guidelines increased mistakes risk. Similarly, Jones et al. (2016) showed that education, financial issues, human resources, and the absence of standardized clinical pathways were the leading causes of errors. Furthermore, Irgens, Henriksen and Moe (2020) found that the variations were caused by the variety in environmental contexts, patients' current functional capabilities and therapists' treatment approaches.

Similarly, another study showed that inadequate equipment and facilities; and unclear therapy plans compromised the treatment decisions (Irgens, Henriksen and Moe,2020). Moreover, therapists' approaches may vary based on their priority whether the patient's recovery or their personal goals. Therefore, the clinical guidelines should contain a standardized time and sequenced actions to achieve the objectives efficiently (Panella, Marchisio and Di Stanislao, 2003; O'Shea *et al.*, 2006).

Irregularity in physiotherapists' treatment choices

The absence of evidence-based guidelines was linked with the lack of physiotherapists' self-confidence to make correct treatment decisions. The junior physiotherapists did not receive any standardized clinical guidelines during their first day of work. They had to observe and learn from other senior physiotherapists during their work period.

> *Therapist C said, "I was confused when I started working here; there is no guidance about treating pediatric patients."–P10*
> *"We needed time to learn from our seniors who have more experience."–P15*

However, even after the training, the physiotherapists presented uncertainty in the correctness and standardization of their interventions. They also showed their interest and support in following SOPs or guidelines in their work.

> *Therapist B said, "Because there are no SOPs, our interventions for patients were not clear. We keep treating the patient, but we do not know whether the intervention toward the guidelines or away from it." –P9*
> *"Could you imagine a health practitioner working efficiently with no standardized operating procedures or standardized guidelines?"–P8*

The guidelines were from senior physiotherapists. Thus, the junior physiotherapists learned by observing, practicing, and discussing the treatment choices with their senior physiotherapists. The absence of SOPs and evidence-based clinical guidelines was associated with less confidence in the efficiency of their treatment choices which varied from time to time. Moreover, this may be caused by the limited number of equipment and thus the limited number of children treated simultaneously. Thus, the children had to take a turn to use one piece of equipment. A therapist would use any available tools to treat the child while waiting for their turn, not following the usual sequences. However, due to the lack of proper documentation, it is difficult to determine the leading cause for the variations

Similarly, Tracy et al. (2010) presented that healthcare systems without a standardized clinical guideline showed variant interventions and more clinical symptoms and thus more difficulty in the evaluation (Tracy *et al.*, 2010). Furthermore, evaluating the current treatment whether it is overtreating or undertreating is not easy due to lack of proper documentation and audit.

The clinical decision should rely on evidence and be supported by transparent updated documentation to be consistent, reliable, effective, and measurable (Varkey, Reller and Resar, 2007; Zhang and

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p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.191-201

Liu,2011). As a consequence, improper variations would be diminished. Moreover, this evidence-based approach is needed to get proper consistent treatment choices (Welsh Government,2016). Therefore, it is recommended to develop clinical evidence-based guidelines in this CBR unit.

Liability for conducting errors

The physiotherapists showed a tendency to feel afraid of making mistakes or breaking laws by working with no SOPs and evidence-based guidelines besides feeling responsible since the patients are capable children.

> *Therapist B said, "I have worked in YPAC for approximately two years. During my work, I did not receive any SOPs. In my opinion, a clinical work without SOPs is illegal"–-P6*
> *Therapist C said, "I am afraid to make mistakes. Moreover, I have to treat a child along with his/her parents."–P11*

The physiotherapists were uncertain about their practice without evidence-based guidelines and worried about making errors. They were aware of the importance of SOPs and guidelines as legal requirements in rehabilitation services.

Furthermore, physiotherapists addressed their liability of conducting mistakes in the therapy sessions associated with the absence of evidence-based guidelines. These results are confirmed by Treiber and Jones (2018) who found that 55% of nursing graduates who did medication error experienced emotional distress afterward. However, no specific errors were detected in the study due to the absence of guidelines.

Moreover, another study supported the results by confirming that more errors occur if healthcare is based on memory rather than guidelines (Tracy *et al.*, 2010). This phenomenon was explained further by Reason (2000) showing the limited capability of the human brain to store and process information. There is a gap between the moment of formulating intention and executing the intended action. This gap leads to failure of memorizing process within the proper place and time causing the most common forms of human errors (Reason,2000). Standardizing rehabilitation protocols and therapists' tasks is required to minimize errors. This strategy led to consistent tasks and interventions reducing the variations in rehabilitation service (Hougaard,2004; Cristian and Tran,2012).

Low self-confidence of physiotherapists toward their professionalism

The physiotherapists believed that healthcare practice with no SOPs and standardized clinical guidelines is an unprofessional matter that should be corrected.

> *Therapist A said, "Regarding the system, sometimes I feel that it lacks professionalism"—P2*
> *Sometimes, I feel a lack of professionalism. Sometimes I tell myself that I should not work like this."–P1 Therapist B said, "SOPs is our guidelines in working."–P7*

The physiotherapists expressed their negative emotions due to working with no SOPs or standardized clinical guidelines. They believed in the role of SOPs and guidelines to guide their work system. This aligns with the Indonesian Physiotherapist Ethical Code, article 10a, which dictates that "a physiotherapist must provide treatment according to a standard consisting of manual and clinical services guideline" (Ikatan Fisioterapi Indonesia,2019).

A standardized clinical pathway is required to facilitate the therapists' understanding of their roles and responsibilities, leading to better information sharing and integration in every level of the CBR system (Panella, Marchisio and Di Stanislao,2003). A systematic review by Rotter et al. (2012) found that implementing a clinical pathway in a healthcare system could reduce safety risks by 5.6%. Additionally, the higher the quality of documentation, the more commitment toward guidelines.

Along with the study, Schröder et al. (2020) evaluated the impact of the

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p-ISSN 2303-3592, e-ISSN 2540-9301
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application of a model in lower back pain units. The study found that the implementation of treatment recommendations increased the physiotherapists' self-confidence and improved their attitudes and beliefs. Their self-confidence and positive behavior lasted for three to twelve months maximally.

Schröder et al. (2020) emphasized that organizational resources and support are the main barriers in the implementation of guidelines. It is because establishing and implementing a clinical pathway involves collaboration between interdisciplinary teams and is time-consuming (O'Shea *et al.*, 2006). Therefore, it is recommended for the managers and physiotherapists to build relationships and communicate at the organizational level. This will facilitate guidelines access to the whole physiotherapists within the organization leading to more adherence to them.

Similarly, Higuchi *et al.* (2012) investigated the impact of standardized guidelines implementation on nurses and midwives in the rural community health service in Timor Leste. Along with this study, the respondents were aware of the standardized guidelines, but there was a difference in their knowledge of guidelines' content. They also expressed a lack of confidence and uncertainty during their work experience.

Higuchi *et al.* (2012) also found that the standardized guidelines had a positive impact on health practitioners in a developing country, especially in the rural community setting. The application of standardized guidelines by nurses and midwives increased their confidence in their practice and medical intervention. Moreover, patients became more satisfied with their practice. The standardized guidelines also facilitated the practitioners' work. Thus, it is highly recommended to implement well-developed standardized guidelines for rehabilitation services for children with disabilities in YPAC Makassar city to raise the physiotherapists' work level and self-confidence.

Evidence-based clinical practice showed that the Indonesian Physiotherapy Association and the Non-Government Organisation have not yet established quality assurance standards, record-keeping guidance, or standardized clinical guidelines in community rehabilitation services. As a consequence, the physiotherapist may not work professionally and show less care to the children. However, insufficient adherence to clinical guidelines and the standardized procedure is considered a law-breaking matter (Pearson, 2008). This may associate with the low tendency of workers to observe, care or evaluate their practice.

Limitations

The study limitations were the small number of participants with only three participants. However, sufficient data were obtained due to the redundancy of responses. Moreover, the effect of working without SOPs and guidelines on the children could not be triangulated due to improper documentation.

Recommendations

The study recommended three levels of external analysis as follows: 1) *Macro Level:* Checking the current services in Indonesian CBR units; Developing guidelines to promote the referral system for CBR units*;* Creating an organizational reporting system to evaluate and investigate the services errors. 2) *Muso Level:* Setting clinical pathways for pediatric rehabilitation*;* Implementing evidence-based guidelines for rehabilitation of children with disabilities. 3) *Micro Level:* Training the therapists to enhance their skills, proficiencies, awareness, and practice; Evaluating the current practice and service delivery; Building relations and communicating at the organizational level.

Conclusion

The study highlighted the physiotherapists' experience in a unit with no SOPs and evidence-based standardized clinical guidelines. The results showed variations in physiotherapists' procedures and treatment, irregularity in their treatment

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p-ISSN 2303-3592, e-ISSN 2540-9301
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choices, liability feeling toward conducting errors, and low self-confidence toward their professionalism. However, it is difficult to evaluate the tangible impact of the lack of SOPs and standardized clinical guidelines on children, families, and healthcare services. Improper documentation is the leading cause of evaluation inability due to the lack of data needed for analysis. This study shows the prominent need for the development of SOPs and standardized clinical guidelines in the CBR unit for children with disabilities.

This study provided an in-depth insight into SOPs and standardized clinical guidelines. It also supported their implementation process to achieve prudent healthcare, especially rehabilitative healthcare in Indonesia. Future studies including more Indonesian CBR units or healthcare services with no standardized clinical guidelines and SOPs are suggested to evaluate their impact on more complex rehabilitative services.

Abbreviations

CBR: Community-Based Rehabilitation
SOPs: Standard operation procedures
YPAC: Yayasan Pembinaan Anak Cacat

Declarations

Ethics Approval and Consent Participant

This study was permitted by manager of Yayasan Pembinaan Anak Cacat Makassar. All participants provided written informed consent prior to enrolment in the study.

Conflict of Interest

The author declares that there is no significant conflict of financial and personal interests that may affect the work performance or presentation.

Availability of Data and Materials

Data dan materials are provided on request

Author Contribution

Author contributed to the conceptualization of work, data acquisition, and analysis of data, drafting, revising, and final approval of the version to be published.

Acknowledgment

The authors would like to thank the manager of YPAC Makassar city for his permission and information and the therapists for their voluntary participation in this study

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Original Research

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.135-149

THE PERFORMANCE DIFFERENCES BETWEEN HIGH AND LOW SALES TURNOVER COMMUNITY PHARMACIES

Perbedaan Performa Apotek Omzet Tinggi dan Apotek Omzet Rendah

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Abstract

Background: Pharmacy managers will make various efforts to increase their income. In spite of this, pharmacies that have the same facilities can generate greatly varied incomes.
Aims: The purpose of this study was to determine the difference between high sales turnover pharmacies and low sales turnover pharmacies as observed through employee motivation, organizational culture, and patient satisfaction.
Methods: This study used an analytical design with a questionnaire and checklist. Consumers were selected using the purposive sampling system to assess patient satisfaction. All employees were sampled to assess work motivation and organizational culture. Data analysis was performed using descriptive, bivariate, and multivariate testing.
Results: Direct observation of pharmaceutical services from the two outlets shows that there were differences in the time it takes for pharmacist to retrieve the drug, the time for providing drug information, collecting information from patients, and the type of drug information provided, as well as employee motivation, organizational culture, and patient satisfaction.
Conclusion: Services at pharmacies with high sales turnover are different from pharmacies with low sales turnover. Empathy has the greatest effect on sales turnover, followed by reliability, responsiveness, assurance, and tangible dimensions. Outlets that have high sales turnover have better organizational culture and higher employee motivation when compared to outlets that have low sales turnover.

Keywords: motivation, organizational culture, patient satisfaction, sales turnover

Abstrak

Latar Belakang: *Berbagai upaya akan dilakukan oleh pengelola apotek untuk meningkatkan omzet. Walaupun demikian, apotek yang memiliki fasilitas sama dapat menghasilkan omzet yang jauh berbeda.*
Tujuan: *Penelitian ini mengidentifikasi perbedaan antara apotek yang beromzet tinggi dan apotek beromzet rendah yang dilihat pada motivasi kerja karyawan, budaya organisasi, dan kepuasan pasien.*
Metode: *Penelitian ini menggunakan desain analitik dengan instrumen kuesioner dan checklist. Sampel dari konsumen diambil dengan menggunakan sistem purposive sampling untuk menilai kepuasan pasien. Semua karyawan dijadikan sampel untuk menilai motivasi kerja dan budaya organisasi. Analisis data dilakukan dengan pengujian deskriptif, bivariat, dan multivariat.*
Hasil: *Pengamatan langsung pelayanan kefarmasian dari kedua outlet menunjukkan adanya perbedaan waktu penyiapan obat, waktu pemberian informasi obat, pengumpulan informasi dari pasien, jenis informasi obat yang diberikan, serta motivasi pegawai, budaya organisasi dan kepuasan pasien.*
Kesimpulan: *Pelayanan kefarmasian di apotek dengan omset tinggi berbeda dengan apotek dengan omset rendah. Empati memiliki pengaruh terbesar pada omzet, kemudian dimensi kehandalan, daya tanggap, jaminan, dan fasilitas fisik/ tangible. Outlet yang memiliki omzet tinggi memiliki budaya organisasi yang lebih baik dan motivasi karyawan yang lebih tinggi jika dibandingkan dengan outlet yang memiliki omzet rendah.*

Kata kunci*: budaya organisasi, kepuasan pasien, motivasi, omzet*

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
Volume 9 No.2 2021 DOI: 10.20473/jaki.v9i2.2021.135-149
Received: (2021-01-26) Revised: (2021-05-05) Accepted: (2021-06-15) Published: (2021-11-28)
Published by Universitas Airlangga in collaboration with Perhimpunan Sarjana dan Profesional Kesehatan Masyarakat Indonesia (Persakmi).

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.135-149

Introduction

In many countries, health reform has been an ongoing agenda (Hermansyah, Sainsbury and Krass, 2018). Pharmacist in Indonesia is crucially need to change the current pharmacy practice (Athiyah *et al.*, 2019). In order to create a more professional climate for the pharmacy practice, some fundamental and entrenched barriers to practice will need to be overcome in Indonesia (Hermansyah, Sainsbury and Krass, 2018). Several challenges are hampering the sustainability of pharmacy services delivery in the setting of primary care (Hermansyah *et al.*, 2020). Therefore the need to strenghthen pharmacy competitiveness is pivotal.

Pharmacies, as places of service for the pharmacist profession, have a social function as well as a business function. The tight competition, changes in consumer tastes, technological advances, and socio-economic changes also require pharmacies to make more improvements in order to carry out both business and social functions properly. The social function of a pharmacy cannot run well without the support of a smooth business function. One of the measuring tools for the success of a pharmacy in carrying out its business functions is the amount of sales turnover. Sales turnover is the total amount of goods or services sales within a certain period, which is calculated based on the amount of money earned and by the volume of goods (Rizal, Romidon and Handika, 2017). There are strong positive relationship between total sales, company efficiency and profitability (Alarussi and Alhaderi, 2018; Nasution, 2020).

Employees in community pharmacies play a far significant and distinct role compared to the employees in traditional retail stores. Employee performance of community pharmacies influence customer loyality (Rabbanee, Burford and Ramaseshan, 2015). Trust in pharmacists leads to satisfaction and finally affect the store loyalty (Castaldo *et al.*, 2016; Nitadpakorn, Farris and Kittisopee, 2017). Loyalty will increase along sales advocacy and improve pharmacy competitiveness (Dung, 2019). Pharmacies run and managed by qualified pharmacists play an important role in good pharmaceutical service and rational drug use (Jawaid, 2016), also significanly enhance health-care outcomes and patient's quality of life (Kristina, Lienaningrum and Aditama, 2021).

The function of Pharmacy dominantly shift to business orientation (Novianita, Sutarsa and Adiputra, 2016). It is necessary to be conscious of the factors that affect the success of pharmacies as business units in order for pharmacy owners to maintain their pharmacies' growth as business units.

Most of the existing studies explain the influence of internal factors on the social side of pharmaceutical services, such as customer satisfaction, customer loyalty, quality of pharmacies, (Nitadpakorn, Farris and Kittisopee, 2017; Dung, 2019; Salem *et al.*, 2020). According to the author's studies on various relevant original articles, there has been no research that explains the factors that directly influence pharmacy sales turnover as an indicator of business success. This study aims to determine the factors that affect pharmacy sales turnover, assuming the pharmacies included in this study have the same facilities and management standards. Factors studied include patient satisfaction, employee work motivation, and organizational culture. Direct observations of pharmaceutical services were carried out to conduct a comparison of pharmaceutical services in each outlet. Thus, the research results can be a reference for pharmacy managers to increase sales turnover through improved pharmaceutical services and better human resource management.

One of the pharmacy networks in the Nusa Dua area divides its outlets into four class classifications, namely classes 1, 2, 3, and 4. The classes are classified based on the sales turnover achieved by each pharmacy. Pharmacy class 1 (one) refers to pharmacies that produce high sales turnover, followed by pharmacy class 2 (two), pharmacy class 3 (three), and pharmacy class 4 (four). Pharmacy

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p-ISSN 2303-3592, e-ISSN 2540-9301
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class 4 (four) refers to pharmacies with low sales turnover or newly established pharmacies. The pharmacy network has a standard management system that is implemented by all outlets (Athiyah *et al.*, 2019). Outlet 1 in this research classified to class 1 (high sales turnover) outlet 2 in this research classified to class 3 (low sales turnover) eventhough both the outlet have the same facilities. This shows that there are other factors outside of standard facilities and management that affect the sales turnover.

Method

This study was conducted with a cross-sectional method. The data were collected by distributing questionnaires and direct observation. Direct observation was carried out using passive participation observation methods. The research was carried out at outlet 1 and outlet 2 of the pharmacy network in the Nusa Dua area from April 2019 to May 2019. Outlet 1 was categorized as a class 1 pharmacy (high sales turnover) and outlet 2 was considered a class 3 pharmacy (low sales turnover). Both pharmacies had the same management standards and facilities, including equally large parking areas, accessible locations, open 24 (twenty-four) hours, and doctor's offices available.

The population of this study was consumers and employees of outlet 1 and outlet 2. The patient group sample consisted of 50 consumers who buy at outlet 1 and 50 consumers who buy at outlet 2. The pharmacy consumers sample for the patient satisfaction assessment was taken by using the purposive sampling technique based on predetermined inclusion and exclusion criteria. Firstly, the sample consisted of the consumers at outlet 1 or outlet 2. Secondly, the sample had to be Indonesian citizen. Lastly, the sample had to be at least 18 years old. The exclusion criteria were the consumers that refused to become respondents and the consumers that did not fill in the questionnaire completely.

Samples were taken with accidental sampling in a direct observation. A total of 50 pharmaceutical services were observed at outlet 1, and 50 pharmaceutical services were observed at outlet 2. The observed pharmaceutical services included self-medication and prescription services, including both concocted prescriptions and non-concocted prescriptions.

Employee samples were taken using the saturated sampling technique. The subjects of this study were all employees who agreed to join this study. In this study, all employees at both outlets agreed to be samples and participated until the research was completed. All respondents in this study agreed to participate after being provided with information and signing the informed consent form.

The instruments used in this study included, firstly, the questionnaire to assess patient satisfaction. This questionnaire referred to the ServQual method developed by Parasuraman, Zeithaml and Berry, (1988). Patient satisfaction could be seen from the gap or ServQual score. ServQual score = perception-expectation. The instrument consisted of an assessment of the patient's expectations and perceptions in five dimensions: tangibility, responsiveness, reliability, empathy, and assurance (Antari, Purnomo and Sumarni, 2011). The questionnaire was designed in the form of a closed-answer statement using a Likert scale.

Secondly, the questionnaire to assess employee motivation and organizational culture was used. The questionnaires for employee motivation and organizational culture assessment were adapted from Anwarudin's research (Anwarudin, Fudholi and Satibi, 2013). The questionnaire was made in a closed form using a Likert scale. The dimensions of evaluating employee work motivation include: trust in the institution, best performance at work, team spirit, and willingness to comply with roles. The dimensions of organizational culture are: good customer service, work priorities, planning, good communication, reward and punishment systems, problem solving, role implementation, time value, performance appraisal, responsibility, self-improvement, and employee appreciation.

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p-ISSN 2303-3592, e-ISSN 2540-9301
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Thirdly, the pharmaceutical service process observation form at the pharmacy was used. Observations on pharmaceutical services included the level of drug availability, the time it takes for pharmacists to retrieve the drugs, the duration of time for information administration, classification of patient information, and types of drug information provided.

All questionnaires used had been tested for validity and reliability using the one-shot method (one measurement). The validity test used was the Pearson Product Moment correlation technique. The reliability test was done by calculating the value of Cronbach Alpha.

Demographic data of respondents consisted of gender, age, most recent level of education, and observational data on the level of drug availability, duration of drug provision, classification of patient information, drug information administration, patient satisfaction, employee work motivation, and organizational culture were processed using descriptive statistics. Patient satisfaction was classified as very low, low, adequate, good, and very good. Employee work motivation and organizational culture were classified as bad, adequate, and good. Coding was done on qualitative data, then processed using appropriate statistical methods.

Patient satisfaction, employee motivation, and organizational culture were also tested using the bivariate test (Chi-square and Mann-Whitney test). A multivariate test (logistic regression) was used to determine the effect of each patient satisfaction dimension simultaneously. The test was conducted using the SPSS (Statistical Package for the Social Science) 21 with a confidence level of 95%.

Result and Discussion

A direct observation aims to provide a descriptive description of pharmaceutical services atboth outlets. The data collected from outlet 1 consisted of 25 prescriptions (consisting of 4 concoction prescriptions and 21 non-concocted prescriptions) and 25 self-medicated transactions. The data collected from outlet 2 was the result of observations on 50 transactions consisting of 4 prescription transactions (only consisting of non-concocted prescriptions) and data on 46 self-medicated transactions. The data collected were similar for both outlet on the records of prescription receipts. The average prescriptions per month at outlet 1 were 300 prescriptions and the average prescriptions per month at outlet 2 were 20 prescriptions. Outlet 1 served more prescription exchanges than outlet 2.

The level of drug availability from the observations at outlet 1 was as follows: 46 drugs available, 3 drugs need substitution, and 1 drug was not available. Based on the drug availability at outlet 2, there were 49 available drugs and 1 substitution/copy drug.

Outlet 1 could provide faster services in terms of retrieving drugs and providing drug information (Table 1) However, the waiting time for services from the two outlets did not exceed the

Table 1. The Duration of Drug Handling Timing and Drug Information Administration

Criteria	Outlet 1 (Minute)			Outlet 2 (Minute)		
	Fastest timing	Longest timing	Average	Fastest timing	Longest timing	Average
Drug Handling Timing						
Concocted prescriptions	10	11	10.75	-	-	-
Non-concocted prescriptions	<1	3	1.9	2	3	2.25
Self-medication	<1	2	1.04	<1	3	1.3
Drug information administration						
Concocted prescriptions	<1	2	1.3	-	-	-
Non-concocted prescriptions	<1	1	1	1	2	1.25
Self-medication	<1	1	1	<1	2	1.08

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Table 2. Patient Information Classification and Drug Information Administration

Criteria	Observational Points	Outlet 1 (%)	Outlet 2 (%)
Verification of recipients of prescriptions and provision of drug information at Prescription services	1. Calling the patient's name	92.0*	75.0
	2. Verify the patient	28.0*	0.0
	3. Information of types of drugs	16.0	75.0*
	4. Information of dosage	16.0*	0.0
	5. Information of the method of use	64.0	75.0*
	6. Information of the rules for using drugs	96.0	100.0*
	7. Information of drug side effects	0.0	0.0
	8. Information of drug storage methods	24.0	25.0*
	9. Non-pharmacological therapeutic information	0.0	0.0
Classification of patient information in self-medication services	1. Drug users	92.0	100.0*
	2. Age of user/patient	32.0*	17.4
	3. The gender of the user/patient	0.0	0.0
	4. Patient's weight	0.0	0.0
	5. Symptoms of the disease	40.0	45.7*
	6. Duration of disease symptoms	92.0*	91.3
	7. Take medication beforehand	52.0*	4.3
	8. Possible drug allergy	52.0*	21.7
	9. The possibility of other diseases/special circumstances	12.0*	0.0
Providing drug information at self-medicated services	1. Information of the type of drug	16.0*	8.7
	2. Information of dosage	12.0*	4.3
	3. Information of method of use	72.0*	34.8
	4. Information of drug rules	76.0	97.8*
	5. Information of drug side effects	76.0*	2.2
	6. Information of drug storage methods	28.0	37.0*
	7. Non-pharmacological therapeutic information	4.0	8.7*

*Higher value for the related observational point

minimum standard set by the ministry of health, which is between 15-30 minutes (Indonesian Ministry of Health, 2016). Similarly, a study at the Denpasar City Health Center has shown that the average waiting time for drug prescription services was 7.82 ± 2.16 minutes for concocted prescriptions and 4.01 ± 1.75 minutes for non-concocted prescriptions (Jaya and Apsari, 2018).

The results of the observations showed that there were some pieces of information that were rarely provided by pharmacists (frequency below 50%) when delivering drugs, which consisted of both prescription and self-medicated services, including types of drugs, dosages, side effects of drugs, storage methods, and provision of non-pharmacological information. Outlet 1 got higher scores in 12 criteria, while outlet 2 got higher scores in 9 criteria of patient information classification and providing drug information (Table 2). According to Gunawan *et al.* (2011) and Made Novianita, Sutarsa and Adiputra, (2016), many observers consider that pharmaceutical services are still below standard. There needs to be increased awareness and engagement with quality and quality improvement efforts in the pharmaceutical sector (Watson and Skea, 2018). There are several possible reasons as to why some criteria of drug information are rarely provided when administering drugs. According to Satibi, Furdiyanti and Rahmawati, (2007), there were obstacles that often faced by pharmacists in providing drug information to patients. Among them, the working time of pharmacists in pharmacies is very limited with a hefty workload, especially in the morning to manage pharmacy administration, readiness as informers, and noncooperative attitudes of the patient. The reduction of pharmacist

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workload is related to timing to provide information and reducing dispensing errors (Shao *et al.*, 2020). Other studies have shown community pharmacists were relatively less confident in their ability to communicate with patients and other health professionals (Hagemeier, Ventricelli and Sevak, 2017). By paying attention to the average time to deliver drug information, which does not reach two minutes, it can be determined that the information provided by the pharmacist is also limited. It is important to note that patient education is an important component in improving adherence to therapy and optimizing the use of drugs (Young, Tordoff and Smith, 2017). Naik Panvelkar, Saini and Armour (2009) state that the higher the frequency of counseling and monitoring and the more directions given, the greater the satisfaction rating derived.

The results also showed that pharmacists rarely did verification before handing over drugs to the prescription service. In self-medicated services, there were some pieces of information that were rarely extracted from patients (showing a frequency below 50%), namely the age of the user, the gender of the user, the user's body weight, symptoms of the disease, and the possibility of other diseases/ special conditions. It can be said that pharmacist did not explore the patient's condition. In accordance with this information, Naughton (2018) states that pharmacists tend to explain or provide more in-depth education for patients without realizing that patient counseling may not be effective without adequate patient exploration of the patient's concerns, beliefs, attitudes, and behavior since the start of the consultation.

Quality indicators are used to improve community pharmacy practice (Alhusein and Watson, 2019). Patient satisfaction is an important indicator of the service quality provided for monitoring and improving the quality of health service delivery (Naik Panvelkar, Saini and Armour, 2009). Parasuraman, Zeithaml and Berry (1988) suggest there are five main sub-dimensions service quality. The service quality dimensions are adapted to suit pharmaceutical services to measure patient satisfaction with pharmaceutical services.

Tangible are physical features. The questionnaire given on the tangible dimension measured the patient's response to the physical condition of the pharmacy, including the cleanliness and proper waiting room. Patient satisfaction on the tangible dimension at outlet 1 was lower than outlet 2. The difference was statistically significant. However, the satisfaction scores of the two dominant pharmacies were in the very poor category, which means that the two pharmacies have not been able to meet the patients' expectations within the tangible dimension. Physical facilities, equipment, and communication materials become important when the patient arrives depressed (S., R. and J., 2018). In line with the results found by Yulia, Baga and Djohar (2016), the performance that attributes to the five pharmaceuticals services dimensions at Depok City pharmacies was still considered to be below the respondents' expectations.

Reliability is the ability to perform the promised services reliably and accurately. The questionnaire given on the reliability dimension measured the patient's response to drug administration and the information provided at the time of drug administration. Patient satisfaction at outlet 1 and outlet 2 on the reliability dimension was statistically similar. Most of the respondents answered that the drugs had been delivered directly by the pharmacist. According to the results of the study, information on how to store drugs and the effects of therapy and drug side effects should be improved. The direct observation also showed the infrequent provision of this information.

Responsiveness is the ability to help customers and provide services quickly. The questionnaire given on the responsiveness dimension included the responsiveness of pharmacists in serving patients. Patient satisfaction for both outlets on the responsiveness dimension was not statistically significant. Most of the respondents thought that the pharmacist responsiveness in serving patients was still insufficient or very insufficient.

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Assurance is the knowledge and courtesy of employees and their ability to generate trust and confidence. The questionnaire on the assurance dimension included the appearance of the pharmacists, as well as the attitude and behavior of the pharmacists while serving the patients. In the assurance dimension, the value of customer satisfaction at outlet 1 and outlet 2 was statistically significant. Outlet 1 had a better assessment on the assurance dimension. The physical appearance of pharmacists, attitudes, and behavior of pharmacists while serving patients were considered to be significantly different between the two outlets.

Empathy is the willingness to care, pay attention to customers, be sensitive to consumer expectations, and always strive to meet consumer needs. The questionnaire on the empathy dimension included the pharmacist's ability to understand the patient in terms of explaining drug information in an easy-to-understand way, giving the opportunity to ask questions, and the pharmacist's willingness to confirm the patient's condition. Outlet 1 had a better rating than outlet 2 on the empathy dimension, which was statistically significant different.

Empathy is a mental state that makes people feel or identify themselves in the same state of feeling or thought as other individuals or groups. To increase public trust, pharmacy workers must be able to show empathy for patients and be supported by the proper facilities of a pharmacy (Antari, Meriyani and Suena, 2019), as well as the competence and confidence to encourage patients to be open (Allinson and Chaar, 2016). Problems related to the profession and professional attitudes require special attention, considering patient welfare is of utmost importance (Unhurian *et al.*, 2018).

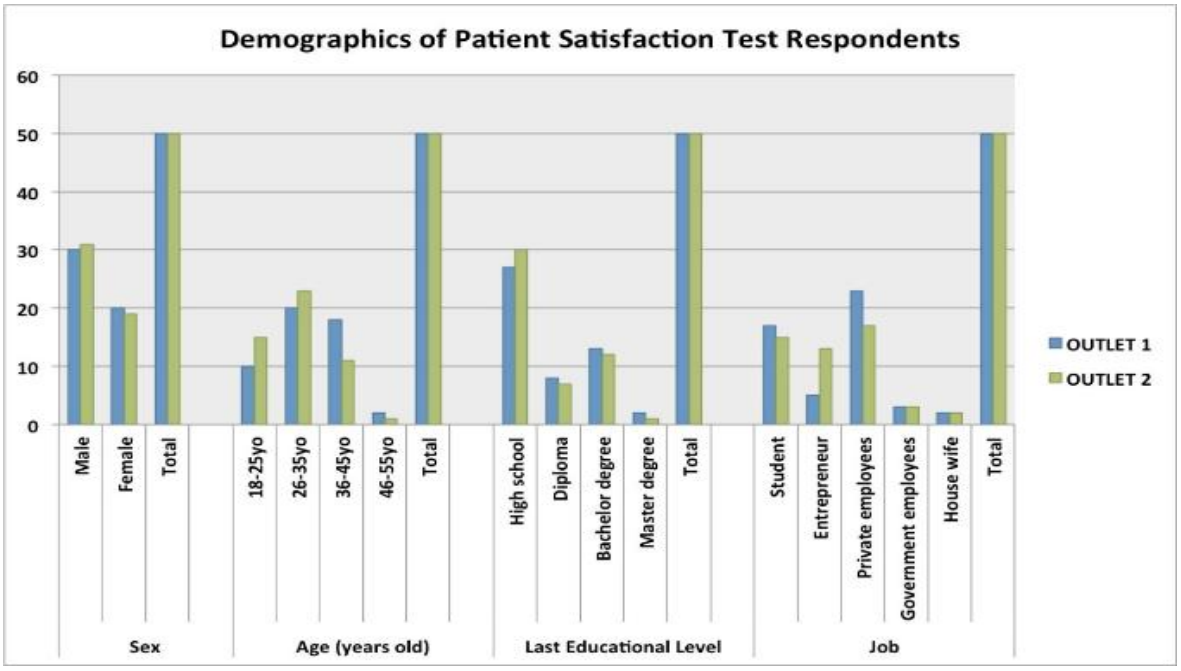

Figure 1. Respondents's demographic data according to patient satisfaction questionnaire

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Table 3. Results of Data Analysis on Patient Satisfaction at Outlet 1 and Outlet 2

Satisfaction classification per dimension	The value from the respondent		Bivariate Analysis
	Outlet 1 n(%)	Outlet 2 n(%)	(P-value)
Tangible			0.040*
Very low	48 (96%)	34 (68%)	
Low	2 (4%)	12 (24%)	
Adequate	-	4 (8%)	
Good	-	-	
Very good	-	-	
Reliability			0.103**
Very low	5(10%)	5(10%)	
Low	8(16%)	2(4%)	
Adequate	5(10%)	7(14%)	
Good	15(30%)	9(18%)	
Very good	17(34%)	27(54%)	
Responsiveness			0.112*
Very low	34(68%)	46(92%)	
Low	15(30%)	4(8%)	
Adequate	1(2%)	-	
Good	-	-	
Very good	-	-	
Assurance			0.026**
Very low	10 (20%)	23(46%)	
Low	10(20%)	9(18%)	
Adequate	12(24%)	7(14%)	
Good	11(22%)	10(20%)	
Very good	7(14%)	1(2%)	
Empathy			0.012**
Very low	3 (6%)	11 (22%)	
Low	8 (16%)	13 (26%)	
Adequate	17 (34%)	10 (20%)	
Good	9 (18%)	12 (24%)	
Very good	13 (26%)	4 (8%)	

* tested using the Mann Whitney test
** tested using the Chi-Square test

Figure 1 shows the demographic data of the respondents in the patient satisfaction test at outlet 1 and outlet 2. Table 3 shows the results of the analysis of patient satisfaction with pharmaceutical services at outlet 1 and outlet 2.

According to Dieleman, Gerretsen and van der Wilt (2009), inadequate performance of health workers is a very broad problem. Poor performance causes inappropriate services and contributes to decreased health outcomes. One of the factors that can support performance is communication skills, for which training is needed to improve pharmacist communication skills. Training on drug administrators has an influence on increasing knowledge of drug management and clinical pharmacy services (Amrullah, Satibi and Fudholi, 2020). According to Rowe *et al.* (2005), in low and middle-income countries, the role of health workers is very important in the delivery of health interventions. Trained pharmacists and assistant pharmacists play an important role in recommending over-the-counter drugs to first-time buyers (Emmerton and Shaw, 2002).

Service quality affects customer satisfaction and customer loyalty (Monica, Dharmmesta and Syahlani, 2017). Satisfied patients are more likely to continue to use health care services, value and maintain relationships with health care providers, adhere to treatment, and have better health outcomes (Naik Panvelkar, Saini and Armour, 2009). Satisfaction is the feeling of pleasure or disappointment

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in someone resulting from comparing the perception of the product received or outcomes associated with expectations (Kotler and Keller, 2006). Patients' expectations for the pharmaceutical services they receive are influenced by several factors, including information received by patients from the surrounding environment, previous experience of using the same services, and patient impressions of the service providers (Antari, Purnomo and Sumarni, 2011). In line with this, it is stated that an important factor that will help advance pharmaceutical services in any country is understanding the needs, expectations, and satisfaction of the community (Jose, Al Shukili and Jimmy, 2015).

A logistic regression test was used to identify the effect of each dimension simultaneously on sales turnover. The dimension that had the highest influence on sales turnover was empathy, followed by the reliability dimension, the responsiveness dimension, the assurance dimension, and the tangible dimension.

Public services, pharmacist attitudes, drug availability, convenience, pharmacy facilities, and location were found to have a very positive effect on patient satisfaction. Increased waiting time for prescription services consistently negatively affected patient satisfaction (Naik Panvelkar, Saini and Armour, 2009; S., R. and J., 2018). Research in Thailand has suggested that consumers' perceptions of pharmacists influenced consumer retention, positive word of mouth, and constructive suggestions to pharmacies, but the quality of the pharmacy structure and drug prices (Nitadpakorn, Farris and Kittisopee, 2017). A study in Japan has found that the domains of pharmaceutical service quality in society included adequate resources, professional expertise, and service policies and procedures (Sato *et al.*, 2020). Satisfied consumers will make repeated purchases and even spread their satisfied impression to others. In addition, satisfaction also creates consumer loyalty to pharmacies resulting in more consumers coming to shop and increasing pharmacy sales turnover with increasing sales volume.

Assessment of employee work motivation and organizational culture at outlet 1 was carried out on 13 respondents, while assessment at outlet 2 was carried out on 9 respondents. Demographics of respondents can be seen in Figure 2. Based on demographics, employees at outlet 1 were mostly female, while employees at outlet 2 were mostly male. Employees at outlet 2 on average were still very young with a maximum age of 31 years, while employees at outlet 1 were with a maximum age of 37 years old. Only one employee at outlet 2 had worked there for more than five years, while at outlet 1 there were two people who had worked there for more than five years.

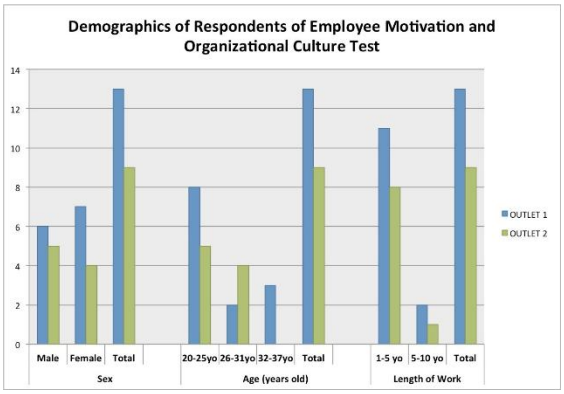

Figure 2. Demographic data of the respondents in the employee motivation and organizational culture test

Employee work motivation data was not normally distributed, thereby the test for differences in employee motivation between the two outlets was carried out using the Mann Whitney test. Median data at outlet 1 was 2.6 (min 2.4; max 2.65) and median data at outlet 2 was 2.4 (min 2.25; max 2.6), and a p-value of 0.007 was obtained with a mean rank at outlet 2 of 7.28 and a mean rank at outlet 1 of 14.42, thus it can be concluded that there is a significant difference in motivation between outlet 1 and outlet 2, with higher work motivation at outlet 1 compared to work motivation at outlet 2. According to the income of both pharmacies, Outlet 1 generated higher sales turnover compared to outlet 2. One of the factors that shape performance is employee motivation. Work motivation will shape performance

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and ultimately form the image of a health service location. According to Zaini, Satibi and Lazuardi (2014), satisfactory pharmacist service is one of the factors that influence consumer intention to use pharmaceutical services.

Employee at outlet 1 and outlet 2 have equal teamwork motivation. Outlet 1 superior at some dimensions of employee motivation such as: trust in the institution, best performance at work, and willingness to comply with role. Employee at outlet 1 have better trust in the institution regarding reward and punishment system. Seems that employee at outlet 1 satisfied with reward and punishment system so they have better motivatian to achieve the best performance and greater willingness to comply with the role in that organization. Work motivation is an impetus in someone to do a task or activity to the best of their abilities in order to attain high achievements (Anwarudin, Fudholi and Satibi, 2013). Researchers and theorists state that motivation can directly influence performance and mediate the influence of other factors. Thus, motivation and interventions that increase motivation and job satisfaction (including salary, prestige, and working conditions) tend to be important determinants (Rowe *et al.*, 2005). Gardjito, Musadieq and Nurtjahjono (2014) stated similar results, who showed that work motivation has a significant effect on performance. High-quality service cannot be provided unless the problem of unmotivated staff is handled comprehensively (Willis-Shattuck *et al.*, 2008). Work environment has a significant effect on motivation (Basuki and Maesaroh, 2017). One of the factors that can encourage increased productivity of human resources is efforts to increase adequate work motivation, such as meeting external needs (meeting primary needs, food, clothing, and shelter as well as adequate environment) and internal needs (the employee desire to place themself in a satisfying career position) (Gardjito, Musadieq and Nurtjahjono, 2014).

Performance in companies depends on the ability and environment as well as motivation (Uneputty, Masruchin and Djoharsyah, 2017). Health worker motivation reflects the interaction between workers and their work environment (Franco *et al.*, 2004). A comfortable, safe, and clean work environment will lead to or increase morale, and a bad work environment will reduce performance (Gardjito, Musadieq and Nurtjahjono, 2014). The work environment is largely shaped by organizational culture. Organizational culture is a set of assumptions or belief systems, values, and norms developed within the organization which serve as a code of conduct for its members to overcome problems of external adaptation and internal integrity (Widiati, 2012).

The median of the organizational culture at outlet 1 was 2.8 (min 2.65; max 2.9) and the median of the organizational culture at outlet 2 was 2.6 (min 2.55; max, 2.75). The data was not normally distributed, thereby the difference test of organizational culture between the two outlets was carried out using the Mann Whitney test. A p-value of <0.001 was obtained with the mean rank of outlet 1 at 15.31 and the mean rank of outlet 2 at 6.00, thus it can be concluded that there is a significant difference in organizational culture between the two outlets. The organizational culture of outlet 1 was rated higher than the organizational culture at outlet 2. Outlet 1 shows better organizational culture at some dimensions namely: communication, reward and punishment system, problem solving, performance appraisal, opportunities for self-improvement, employee appreciation and role implementation. Role implementation was in line with employee motivation to comply with the role in that organization as well as reward and punishment system, and performance appraisal system.

The results are in accordance with the sales turnover of pharmacies. Pharmacies that had high sales turnover (outlet 1) had a better organizational culture than pharmacies that had low sales turnover (outlet 2).

Organizational culture is an internal factor that reflects the way employees do their jobs, such as making decisions and serving customers, which can be seen and

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p-ISSN 2303-3592, e-ISSN 2540-9301
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felt by people outside of the organization (Jatiningrum, Musadieq and Prasetya, 2016). The type of organizational culture has a significant effect on employee performance (Asy'ari and Nurnida, 2018). The most influential factor on work productivity is organizational commitment, meaning that with high organizational commitment, employees will automatically work hard for the company, be proud of the company, and have a good emotional bond with the company (Kosasih, 2019).

In spite of the results stated earlier, this study has some limitations. The results of direct observation of pharmaceutical services are possibly bias. The art of communication to explore and convey information from each pharmacist cannot be well-described through the observation method using a checklist. Since the researcher only observed without interacting with the staff, the results of the observations were made without any attention to why such information was not extracted or given by the pharmacists to the patients. For example, dosage information was rarely given because the pharmacists thought that the dosage information had also been conveyed when they told the patients about how to use the drug (one tablet taken three times a day). The results showed that the pharmacists rarely conveyed precise weight or volume measurements, for example, 500 mg paracetamol tablets or 5 mL paracetamol syrup. Patient verification was also no longer done. If there is only one patient waiting for a prescription, there is no need for verification. The limitations of pharmaceutical services found at the two outlets may be a general description of the implementation of pharmaceutical services in Indonesia, therefore a larger subject is needed to ensure this.

Conclusion

As the results of this study show, the pharmaceutical services at outlets with high sales turnover is different from pharmaceutical services at low sales turnover outlets. Based on the logistic regression test, the satisfaction dimension that had the highest effect on sales turnover involved empathy, followed by the reliability dimension, the responsiveness dimension, the assurance dimension, and the tangible dimension, which had the weakest influence. Outlets that have high sales turnover also have better organizational culture and higher employee motivation when compared to outlets that have low sales turnover.

Abbreviations

SPSS: Statistical Package for the Social Science; Min: Minimum; Max: Maximum; mg: miligram; mL: mililiter.

Declarations

Ethics Approval and Consent Participant

Respondents were addressed before the survey about the survey's objectives and purposes, and verbal consent to participate in the study was taken from them.

Conflict of Interest

The authors declare that there are no significant competing financial, professional, or personal interests that might have affected the performance.

Availability of Data and Materials

Data and material research can be provided by upon request.

Authors' Contribution

NPUA conceptualized the study and created the methodology; NPUA, NPDA, and NMDSS wrote, reviewed, and edited the manuscript; NPUA and NMDSS wrote the original draft.

Acknowledgment

We would like to thank the Faculty of Pharmacy, Universitas Mahasaraswati Denpasar, for their technical support, and to the respondents in the Community Pharmacies and all the contributors who helped in this study.

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
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Original Research

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.180-190

INVENTORY CONTROL OF DISPOSABLE MEDICAL MATERIALS AT THE BALI MANDARA EYE HOSPITAL

Menilik Pengendalian Persediaan Bahan Habis Pakai Farmasi di Rumah Sakit Mata Bali Mandara

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Abstract

Background: As a health service institution, hospitals have characteristics and management complexities which have an impact on their financing aspects. Controlling the supply of pharmaceutical supplies aims to create a balance between supply and demand in order to realize effective and efficient health services.
Aims: This study aimed to design a method for controlling the optimal supply of disposable medical materials at the Bali Mandara Eye Hospital, Bali.
Methods: This is a qualitative study based on in-depth interviews with three informants, and involving 11 doctors (users) to determine the critical value of disposable medical materials.
Results: ABC analysis was used to classify all types of goods based on their importance to determine priorities based on the value of use. The budget allocation was dominated by only a small portion or only a few types of pharmaceutical supplies. The results show that there was a decrease in the total cost of inventory by 19.14% after the application of the EOQ method. The application of the reorder point (ROP) method can anticipate the occurrence of stock outs or vacancies.
Conclusion: The EOQ method is more efficient than the conventional method applied at the Bali Mandara Eye Hospital Pharmacy Installation. The EOQ and ROP methods greatly affect the efficiency and effectiveness of controlling the inventory of medical disposable materials at the Bali Mandara Eye Hospital.

Keywords: : inventory control, effective and efficient, medical disposable materials,

Abstrak

Latar Belakang: *Sebagai institusi pelayanan kesehatan, rumah sakit memiliki karakteristik dan kompleksitas manajemen yang berdampak pada aspek pembiayaannya. Pengendalian persediaan perbekalan farmasi bertujuan menciptakan keseimbangan antara persediaan dan permintaan agar terwujud pelayanan kesehatan yang efektif dan efisien.*
Tujuan: *Penelitian ini bertujuan untuk membuat rancangan metode pengendalian persediaan bahan habis pakai farmasi yang optimal di Rumah Sakit Mata Bali Mandara Provinsi Bali.*
Metode: *Analisis ABC digunakan untuk mengelompokkan semua jenis barang berdasarkan kepentingannya sehingga dapat ditentukan prioritas pesanan berdasarkan nilai guna. Padahal, alokasi anggaran didominasi hanya sebagian kecil atau hanya beberapa jenis perbekalan farmasi. Penelitian ini merupakan penelitian kualitatif dengan wawancara mendalam dengan tiga orang informan, dan dengan melibatkan 11 dokter (user) untuk menentukan nilai kritis bahan habis pakai farmasi.*
Hasil: *Terjadi penurunan total biaya persediaan sebesar 19,14% setelah penerapan metode EOQ. Penerapan metode Reorder Point (ROP) dapat mengantisipasi terjadinya stock out atau kekosongan.*
Kesimpulan: *Metode EOQ lebih efisien dibandingkan dengan metode konvensional yang diterapkan di Instalasi Farmasi RS Mata Bali Mandara. Metode EOQ dan ROP sangat berpengaruh pada efisiensi dan efektivitas pengendalian persediaan bahan habis pakai farmasi di IFRS Mata Bali Mandara.*

Kata kunci*: bahan habis pakai farmasi, efektif dan efisien. pengendalian persediaan,*

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
Volume 9 No.2 2021 DOI: 10.20473/jaki.v9i2.2021.180-190
Received: (2021-02-03) Revised: (2021-06-28) Accepted: (2021-08-01) Published: (2021-11-28)
Published by Universitas Airlangga in collaboration with Perhimpunan Sarjana dan Profesional Kesehatan Masyarakat Indonesia (Persakmi).

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.180-190

Introduction

Throughout the COVID-19 pandemic across the world, for more than three months the public stayed at home. Working, studying, and most other daily activities are being done from home. Many changes have occurred, not only in the fields of education and economics, but also in the environmental field, especially in regards to the problem of solid waste. According to the Indonesian Ministry of Health and the Healthy Living Community Movement has guidelines for managing hospital waste in referral hospitals, emergency hospitals, and community health centers. They state that materials categorized as COVID-19 waste include goods or materials that will not be reused and are left over from activities wherein they were potentially contaminated by infectious substances, patients, and/or officers in health care facilities that handle COVID-19 patients. These include used masks, used gloves, used bandages, used tissue, used food and beverage plastic, used food and beverage paper, used syringes, used infusion sets, used personal protective equipment, and patient food scraps from service activities in the ER, isolation room, ICU room, treatment room, and other service rooms. It can be seen that COVID-19 waste is included in the category of solid medical hazardous and toxic waste (B3) (Gurumurthy *et al.*, 2020). As health service institutions, hospitals have characteristics and management complexities which have an impact on their financing aspects (Ballou, 2004). The procurement of pharmaceutical supplies in the form of drugs and consumables represents a large portion of the costs in the health industry, particularly hospitals. The provision of quality pharmaceutical supplies is very important in supporting health services in hospitals, and this activity cannot be separated from the hospital supply management. Proper pharmaceutical supply management is essential to ensure the availability of adequate drugs and consumables for health services to patients and as a source of income for hospitals (Dewi *et al.*, 2020).

Transportation and inventory costs are interrelated and comprise the greatest portion of total logistics costs (Ballou, 2004). Controlling the supply of pharmaceutical supplies is one part of logistics management. It aims to manage the availability of pharmaceutical supplies according to needs in order to ensure that there is no shortage or excess supply. Shortages cause disruption of service activities to patients. On the other hand, excessive inventory causes cost overruns and restrained capital, which, if the turnover is not achieved, will cause losses for the hospital. Stock of consumable medical materials is considered to be good when the availability of consumable medical materials is at an optimal amount, not less than the safety stock, and not more than three times the monthly use. Stagnant conditions lead to negative impacts such as increased expiration of medical consumables, lost opportunities, and lost revenue for clinical pharmacies. Conditions of deprivation not only causes a decrease in income but also contributes to higher mortality and morbidity for patients in critical condition. Lost opportunities and lost revenue occur in a stagnant state because inventory costs, ordering costs, and handling costs are increasing (Essam *et al.*, 2020; Hales *et al.*, 2017; Minken and Johansen, 2019).

According to Satibi (2014), a good supply of pharmaceutical supplies is when the availability is at an optimal amount, not less than the safety stock and no more than three times of monthly usage. Controlling the supply of pharmaceutical supplies aims to create a balance between supply and demand in order to realize effective and efficient health services. Good inventory management will be able to increase hospital revenue while still ensuring quality health services for patients (Rochmah, 2019). The results of Octaviany's (2018) study state that economic order quantity (EOQ) is highly recommended in controlling drug supplies in hospitals. Hartih *et al.* (2013) stated that the EOQ and ROP methods can reduce the value of regular drug supplies in hospitals. The same thing is also shown in a study by Dewi *et al.* (2020), which states that EOQ is an

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p-ISSN 2303-3592, e-ISSN 2540-9301
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effective and efficient method of inventory control to prevent drug vacancies and stagnation. An inventory control system is needed to maintain the availability of optimum pharmaceutical logistics in order to meet the needs in the right quantity, quality, and time, as well as minimize cost. Inventory control activities can achieve budget efficiency and minimize risks arising from excess or under-stock (Akhmad, 2018). Management of drugs and medical consumables that are effective and efficient is an important factor in hospital management. This ensures optimal availability of drugs and medical consumables in terms of quality, type, amount, time, and rational use. This allows for the available funds to be used as effectively as possible for health services (World Health Organization, 2014). The expenditure budget for drugs and medical consumables at the hospital is the largest component of hospital expenditure. In many developing countries, spending on medicines and medical consumables in hospitals accounts for about 40% to 50% of the total hospital budget. This large budget must be managed effectively and efficiently in order to meet the needs of healthcare for patients. Efficient use of medical consumables can be realized through a good inventory planning and control system. Inefficient management of drugs and consumable medical materials will have a negative impact on hospital costs and patient recovery rates (Indonesian Ministry of Health, 2019).

The Bali Mandara Eye Hospital (BMEH) is a special type A hospital owned by Bali's provincial government which provides eye health services. Similar to service companies in general, the BMEH also needs supplies to support its operational activities. This study focuses on the supply of disposable medical materials because they take up more of the budget than any other supply, and they are a vital element for the implementation of health service activities at the BMEH. All pharmaceutical supplies at the BMEH are managed one door under the Hospital Pharmacy Installation (IFRS). The IFRS is a unit in the hospital that is fully responsible for managing the logistics at the hospital. Based on a preliminary study conducted at the BMEH Pharmacy Installation, planning for the need for pharmaceutical supplies is carried out using the consumption method based on historical usage in the last three months. Additional orders are made with an estimate of 20%-25% of the average usage. The calculation of needs is still done manually, even though there is a hospital information system to manage supplies. Currently the hospital information system is only used to record incoming and outgoing supplies, but cannot provide information about the optimal quantity to be ordered or when these items should be ordered.

Planning is carried out using the consumption method based on the average usage of the last three months adjusted to the remaining stock in the warehouse. The procurement of drugs and consumable medical materials is carried out directly by the provider (distributor) by taking into account the ease of orders, the availability of goods from the distributor, and the capacity of the drug warehouse. In addition, at the BMEH Pharmacy Installation, there has never been a method of controlling drug supplies/consumables through inventory classification to facilitate supervision. This needs to be done because the number of supplies of drugs/consumables in the IFRS BMEH Drug Store is very large, namely 672 items. Thus, it is necessary to group according to the level of importance to determine the types of drugs/consumables that need to be prioritized. Based on this phenomenon, the researcher wanted to help develop a control system for the supply of pharmaceutical supplies at the BMEH to fulfill the role of the Pharmacy Installation as one of the hospital's revenue centers. Planning with the consumption method becomes inaccurate when there is an increase in cases. There are still frequent purchases of cito outside of planning, meaning the service is less effective and efficient. This shows the need for good management of pharmaceutical supplies, especially disposable medical materials. It is necessary to implement proper planning; therefore, an adequate analysis is required, such as ABC, EOQ, or ROP. Sensitivity analyses are conducted based on the parameters including truck loading capacity, inventory carrying cost

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p-ISSN 2303-3592, e-ISSN 2540-9301
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percentages, unit shortage costs, unit ordering costs, and unit transport costs to support optimal distribution system design (Lai *et al.*, 2021). This is consistent with research by Chang *et al.* (2008); Fan *et al.* (2009); Hales *et al.* (2017); Tongzon *et al.* (2009); Ugboma *et al.* (2006), who examined other objects, namely port selection, influenced by several factors in accordance with Buffa's (1986) theory of restocking inventory in groups, which supports this study. Researchers wanted to get an overview of the process of controlling pharmaceutical supplies at the BMEH, before and after the application of the EOQ and ROP methods, to produce a solution for controlling hospital supplies, especially pharmaceutical supplies.

Method

This study used a quantitative research design. A qualitative approach was used to describe the process of controlling consumable supplies at IFRS BMEH. Data collection was carried out via in-depth interviews with four informants, as well as through observation. Meanwhile, operational research was done by involving users or doctors to determine the critical value of disposable medical materials by filling out a Google Form questionnaire. In addition, secondary data processing was also carried out by obtaining a list of consumable pharmaceutical supplies for the period of January 2019-December 2019, which was analyzed using the ABC method. This research was also conducted by comparing the total inventory cost before and after the application of the EOQ and ROP methods to see whether the application of these methods can increase the efficiency and effectiveness of the inventory of disposable medical materials at the BMEH Pharmacy Installation.

Result and Discussion

Inventory control at the BMEH

Based on the results of in-depth interviews with the four informants, it is known that the planning process for the supply of disposable medical materials at the BMEH Pharmacy Installation is done with the consumption method. This method calculates the need for disposable medical materials based on the average usage for the last three months adjusted to the budget available, as well as based on the remaining stock at the hospital. The selection and planning process for disposable medical materials at the Pharmacy Installation is guided by the BMEH Formulary and the National Formulary. The method used for the inventory planning system and the procurement of consumables is the consumption method and hospital needs. According to the informant, the consumption method has several obstacles, one of which is when there is an increase in cases, the demand from the unit also increases, and as a result the drug warehouse cannot meet the demand. The first informant stated that the use of the consumption method was not very accurate. Ideally, planning for drugs/consumables is done using several methods such as ABC, VEN, and adjusting to conditions in the field to further validate planning data. Planning is ideally done using a method that can be accounted for and the basics of planning that have been determined, including consumption, epidemiology, and a combination of consumption and epidemiology. Planning must also include consideration of available budget, priority setting, remaining inventory, previous period usage data, order waiting time, and development plans. Eissa *et al.* (2020) evaluated suppliers in a healthcare facility by applying statistical process optimization tools in managing the inventory of products' quality. They selected random records of container deliveries from three different suppliers and analyzed products' characteristics using statistical process control (SPC) tools. The results indicated that most dominant manufacturers supplied the product having specifications close to the target values, whereas the least contacted vendor revealed the highest precision.

The availability of medical disposable materials at the BMEH was monitored

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p-ISSN 2303-3592, e-ISSN 2540-9301
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through stock cards and the Hospital Information System (SIMRS). However, the data on the use of medical disposable materials from SIMRS are historically inaccurate, forcing manual usage calculations to still be carried out based on the amount of expenditure on the card and stock of goods. The combination of the FIFO (first in first out) and FEFO (first expired first out) methods is used at the time of releasing goods to prevent damaged and expired goods. This evaluation is carried out every quarter, namely in March, June, September, and December. In addition, an evaluation of the expired date of medical disposable materials is also carried out at the time of stock-taking to find out which items will expire in the next year. Physical checks are also done every day to ensure that the items recorded on the stock card match their physical quantities. Overall, the obstacles faced in controlling the supply of medical disposable materials at the BMEH Pharmacy Installation, according to the informant, were when there is an increase in cases and inadequate procurement planning using the consumption method, which led to an increase in the demand for consumables. As a result, there are frequent *cito* (immediate) orders from distributors, and inventory control becomes ineffective and inefficient. The purchase of *cito* or small purchases is not in line with the purpose of inventory control as expressed by Satibi (2014). In addition, the calculation of needs based on hospital policy is still not optimal where there are still excess orders for certain items. This means that there is excess stock which, if not properly supervised, will accumulate and expire. Products that have piled up in the warehouse will become retained capital for the hospital and will increase storage costs. In addition, vacancies in distributors or factories and late delivery also often make it difficult to procure medical disposable materials supply.

ABC Usage Analysis

Based on Table 1, from 174 items of analyzed medical disposable materials using the ABC analysis, it is known that the Group A is the consumable material with the highest usage. Group A had a usage of 64,802 or takes up 69.19% of the total usage, consisting of 12 items or 6.89% of the total items of disposable medical materials. Group B had consumables with moderate use, namely 19,168 or 20.46% of the total usage, consisting of 25 items or 14.37% of the total items of disposable medical materials. Group C had consumables with low usage, namely 9,693 or 10.35% of the total usage, consisting of 137 items or 78.74% of the total items of disposable medical materials.

The results of the calculation of the value of use from the ABC analysis show that the percentage composition of drug items for groups A, B, and C was inversely proportional to the percentage of total use. Group A, as opposed to groups B and C, should have tighter physical inventory control, and the accuracy of inventory records on item A should be verified more frequently (Heizer *et al.*, 2017). The calculation results also show that group C used as much as 10.35% of the drug supply, but covered 78.74% of all drug items. This indicates that there were many items in group C with low movement. The existence of this calculation can be used to select which disposable medical materials really need to be procured and which ones do not need to be re-stocked because too many low-moving items will make monitoring difficult and risk expiration. ABC analysis was used to classify all types of goods based on their importance to determined priorities based on the value of use. In fact, the budget allocation was dominated by only a small portion or only a few types of pharmaceutical supplies. Types of pharmaceutical supply can be budget-heavy because of their many uses. This is in accordance with the Pareto principle stated in the theory of (Heizer *et al.*, 2017). This theory states a small proportion of goods are the same types of items as those in group A, which is very

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p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.180-190

important because they have the greatest use value. This means they require strict attention in controlling inventory, where it can be monitored within a fixed and strict time period (e.g. every month) using the EOQ order model. The attention given to control group B is not too strict, unlike group A. Evaluation can be done within a period of 6 months or 3 months. Whereas for group C, inventory control in this group was carried out very loosely compared to groups A and B. The evaluation could be carried out in a period of one year or every 6 months.

ABC Analysis of Investment Value

There were 174 items of disposable medical materials. After being analyzed with the ABC Investment analysis, it is known that Group A consisted of 12 items or 6.90% of the disposable medical materials with an investment value of Rp.3,110,809,628.00 or a share of 68.28% of the total investment value. Group B consisted of 22 items or 12.64% of the total items of disposable medical materials with an investment value of Rp.977,726,591.93 or a share of 21.46% of the total investment value. Group C consisted of 140 items or 80.46% of the total disposable medical materials with an investment value of Rp.467,416,118.71 or 10.26% of the total investment value.

This shows that Group A absorbed very high investment; therefore, it is necessary to regulate the inventory. This is especially important to avoid stockpiling because disposable medical materials with high investment value also cause high storage costs. To reduce storage costs, periodic small orders can be made. However, it should also be noted that there is no stock out because the cost of purchases outside of planning is also high due to the high value of drugs. Through the ABC analysis of investment value, it was found that Group C had many types of consumables that were barely used between January 2019-December 2019. Thus, it is necessary to evaluate the types of consumables that currently exist, whether they need to be procured or can be arranged for procurement according to orders. This is to eliminate the need for inventory that is at risk of damage, expiration, and increased storage costs. To reduce storage costs, periodic small orders can be made. However, it should also be noted that there is no stock out because the cost of purchasing outside of planning is also high due to the high value of goods.

ABC Critical Index Analysis

Group A of the ABC critical index analysis consisted of 11 items, or as much as 6.32% of the total disposable medical materials. Group B consisted of 105 items, or as much as 60.34% of the disposable medical materials.

Group C consisted of 58 items, or as much as 33.33% of the total disposable medical materials. Inventory classifying is a must when it comes to large quantities of products. Consumable medical supplies were classified using the ABC analysis of critical index to see the level of criticality based on the clinical importance of each item. There were 11 medical consumables included in Group A. These items included medical consumables which need attention in procurement. This is because, in addition to having high use value and investment value, they also have a high level of criticality due to their use which cannot be postponed to avoid vacancies. In addition, fund management can be allocated to ensure the availability of critical index Group A consumables to meet demand. In other words, monitoring of Group A critical index needs to be done strictly to provide optimal service for patients. The ABC analysis of the critical index shows that the critical value was two times the value in use and the value of investment. In other words, the priority of procurement was not based on the value of the investment or the value of use, but rather on how important the goods were based on their use. For example, Rohtovisc and ophthalmic drape cannot be suspended even though they

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.180-190

Table 1. List of Group A medical disposable materials based on the ABC critical index analysis

No.	Name of medical disposable materials	Critical Index of ABC Value
1	Rohtovisc	11.17
2	Opthalmic Drape Green OM	10.67
3	AOK Microknife 15,0 deg str	10.33
4	Probe Icare TA 03	10.00
5	Cons comb vit pro pak 23 GA	10.00
6	Centurion ACT IRR FMS Pack 0.9 Ultra Bal	10.00
7	Cassete Phaco infiniti (Ultrasound FMS Basic)	10.00
8	Arciolane 5500	9.67
9	Arciolane 1300	9.67
10	OPO 71-Next Generation Pheco DP-Pack	9.64
11	Grieshaber Rev ILM	9.64

have small investment values because Rohtovisc is a viscoelastic fluid which functions to protect intraocular tissue during cataract surgery. Meanwhile, the ophthalmic drape functions to absorb fluid during eye surgery.

The ABC critical index analysis showed that the critical value was twice the value in use and the value of investment. In other words, the priority of procurement is not based on the value of the investment or the value of use, but rather on how important the goods are based on their use. Based on the research results, there were 11 disposable medical materials included in the critical index group A. These eleven items include items that need attention in procurement because they have high use value and investment value, but also have a high level of criticality because their use cannot be postponed so that no vacancies may occur. In other words, the priority of procurement is not based on the value of the investment or the value in use, but rather on how important the consumables have important value. In addition, fund management can be allocated to ensure the availability of critical index group A medical disposable materials to meet demand. Monitoring of group A critical index needs to be done strictly so that patients can get optimal care. By selecting the appropriate inventory method, the total cost of supplies can be reduced while maintaining the level of service for patients. With the selected inventory method, it will be known when to place an order (reorder point) and the recommended amount of purchases (EOQ).

EOQ of Group A Medical Disposable Materials, ABC Analysis of Critical Index

When calculating the EOQ for each order, data were required regarding the number of requests per year, ordering costs, and carrying costs. The number of requests per year was determined based on the results of document review. Ordering fees and storage costs were obtained through in-depth interviews with the pharmacist coordinator of procurement at the pharmacy warehouse. According to informants in the interview, ordering goods has never taken these costs specifically. In this study, researchers used the theory from (Heizer *et al.*, 2017) where for storage costs the percentage of costs in general is 26% of the unit cost or price per item of goods. Gurumurthy *et al.* (2020) stated that a deep dive into the A-class items revealed that some of the medical supplies fell under both vital and scarce categories. Hence, it was recommended that the case hospital should follow the economic order quantity (EOQ) with the safety stock approach, as these items were to be shipped from other states in India. Subsequently, the focus should be on developing a local supplier and attempts should be made to establish a *kanban* system with adequate information sharing.

When placing an order with a distributor, the procurement coordinator pharmacist uses the WhatsApp (WA)

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p-ISSN 2303-3592, e-ISSN 2540-9301
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service. The data package used every time you order with the WhatsApp call service for 1 minute is 0.2 MB, at a cost of Rp.1/KB (m.industry.co.id). If the WA call duration for each order is 5 minutes, then the data package used is 1 MB, equivalent to 1,000 KB. If calculated in rupiah, it becomes Rp.1,000 per order.

EOQ calculation data showed that items with high prices (example: Cons comb vit pro pack 23 GA), although high in usage, were low in EOQ because storage costs were quite high (26% of the unit cost). Storage costs will be high if the medical supply provider stores large amounts of it and also risks increasing costs due to expiration, damage, and loss. Meanwhile, EOQ items with cheaper prices, such as Rohtovisc, were relatively higher in EOQ because their storage costs were not too high and it was not too risky storing a considerable amount of them. Overall, the application of the EOQ method had an impact on reducing the total cost of inventories by 19.14%. This is in line with research which states that the EOQ method can help companies minimize inventory costs (Dewi *et al.*, 2020). Planning with the EOQ method in a company will be able to minimize the occurrence of stock out, prevent interference with the processes within the company, and allow the company to save on inventory costs. This is also in line with Ercis and Widodo (2013) research, which states that the EOQ and ROP analyses are some of the strategies that can be adopted in an effort to control costs and increase efficiency both in terms of quantity and time of ordering. Hospital operational costs will be more efficient with cost efficiency in inventory management. Both ordering and storage costs must be balanced to avoid losses. If one of them swells, there will be a problem and this will hinder service to patients. If the number of orders during a certain period increases, the annual order fee will also increase. Conversely, if the number of orders is reduced, the ordering costs will also be reduced. Meanwhile, the storage fee depends on the size of the order. The bigger the order size, the higher the storage cost and vice versa. EOQ is the point where there is a balance between ordering costs and storage costs. Minken and Johansen (2019) propose an EOQ model incorporating detailed transport costs. This considers not only the transportation costs but also loading and unloading costs. They argue that a policy measure that reduces expected transport time and its uncertainty would enhance firms to reduce their safety stocks while maintaining the same service levels (or improve service levels with the same level of safety stock).

Table 2. Comparison of total inventory cost with EOQ method and conventional hospital method

Name of medical disposable materials	Average Procurement Per Month	EOQ	Total Cost Before EOQ Implementation (Rp)	Total Cost After EOQ Implementation (Rp)
Rohtovisc	227	24	2,715,577	744,910
Opthalmic Drape Hijau OM	201	34	1,036,742	366,133
AOK Microknife 15,0 deg str	202	17	3,801,548	1,029,263
Cassete Phaco infiniti (Ultrasound FMS Basic)	17	2	1,744,513	1,486,116
Centurion ACT IRR FMS Pack 0.9 Ultra Bal	15	2	2,571,440	2,286,408
Cons comb vit pro pak 23 GA	15	1	12,790,260	11,374,322
Probe Icare TA 03	142	41	382,839	206,145
Arciolane 1300	4	1	1,123,940	1,857,755
Arciolane 5500	7	1	2,397,367	3,018,829
Grieshaber Rev ILM	5	1	1,657,276	1,810,689
OPO 71-Next Generation Pheco DP-Pack	12	2	1,582,921	1,536,493
Total			31,804,423	25,717,062
Efficiency				6,087,361
(%)				19.14%

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p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.180-190

Table 3. Results of ROP calculation for medical disposable materials for Group A ABC analysis of critical index

Name of medical disposable materials	1 year usage (D)	EOQ	average usage per day (d)	L	ROP (d x L)
Rohtovisc	2,741	24	9.26	1	9
Opthalmic Drape Hijau OM	2,443	34	8.25	1	8
AOK Microknife 15,0 deg str	2,378	17	8.03	1	8
Cassete Phaco infiniti (Ultrasound FMS Basic)	199	2	0.67	1	1
Centurion ACT IRR FMS Pack 0.9 Ultra Bal	171	2	0.58	1	1
Cons comb vit pro pak 23 GA	168	1	0.57	1	1
Probe Icare TA 03	1,786	41	6.03	1	6
Arciolane 1300	49	1	0.17	1	0
Arciolane 5500	88	1	0.30	1	0
Grieshaber Rev ILM	33	1	0.11	1	0
OPO 71-Next Generation Pheco DP-Pack	143	2	0.48	1	0

Overall, the application of the EOQ method has an impact on reducing the total cost of inventories by 19.14%. This is in line with Dewi *et al.* (2020) research which states that the EOQ method can help companies minimize inventory costs. This is also in line with Ercis' (2013) which states that EOQ and ROP analysis is a strategy in an effort to control costs and increase efficiency both in terms of quantity and time of ordering, so that with cost efficiency in inventory management, hospital operational costs will be more efficient.

ROP (Reorder Point) of Medical Disposable Materials Group A ABC Analysis of Critical Index

The calculation of the reorder point (ROP) requires an average number of usage per day, lead time, and safety stock. The average number of usage per day can be calculated based on document review. Based on the results of in-depth interviews with the second informant, it is known that the waiting time required from the time of ordering until the goods are received (lead time) is usually one day because almost all distributors are in the city. Meanwhile, information was also obtained that the safety stock policy was not enforced, because it is included in the calculation of the addition every time planning is 20-25%.

From the calculation of ROP without using a safety stock policy, it was found that four items had an ROP value equal to zero. This is also due to the optimal amount in each order (EOQ) being one. In other words, it can be assumed that the hospital will place an order when the inventory level for the item reaches zero, and the company will immediately receive the item. However, this has the risk of hindering service activities, especially if there is a lack of goods or late delivery from the distributor. According to the Heizer *et al.*, (2017), the calculation of safety stock (safety stock) can help reduce orders outside of planning due to stock outs which result in additional costs. With the results of the calculation of safety stock, officers at the logistics warehouse can be helped to determine when to place an order. This can be especially helpful if there is a delay in delivery from distributors who are outside the area and during certain periods in the year such as religious holidays and national holidays. This way, the availability of medical disposable materials is maintained and does not interfere with service to patients.

Conclusion

The EOQ method is more efficient than the conventional method applied at the BMEH Pharmacy Installation, where there was a decrease in the total cost of supplies by 19.14% after implementing this method. The application of the ROP method can anticipate the occurrence of stock outs or vacancies. These two methods greatly affect the efficiency and effectiveness of

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.xxxx.2021.xx

controlling the inventory of disposable medical materials at the BMEH. The BMEH Pharmacy Installation does not yet have an adequate pharmaceutical supply control system. Planning and procurement are still carried out conventionally based on the historical usage of the last three months and are carried out by manually checking which items will or have run out. The BMEH Pharmacy Installation has carried out accurate records of the entry and exit of goods and the expiry date of pharmaceutical supplies manually with a stock card, which can become a reference in implementing the EOQ and ROP methods in the future. ABC analysis serves to determine inventory priority. Inventory items with high investment value require a more stringent control system than those with low investment value.

Suggestion

Ordering costs and storage costs for pharmaceutical supplies should be calculated in real time, in order to produce a more accurate EOQ calculation to increase the efficiency of hospital operational costs. The accurate calculation cannot be based on estimates, especially if there is a delay in delivery from distributors. Development of a hospital information system (SIMRS) is necessary to the inventory process. It plays a part in creating an integrated system that can support logistics management tasks in pharmaceutical installations in the planning and procurement process.

Abbreviations

BMEH: Bali Mandara Eye Hospital; EOQ: economic order quantity; ROP: Reorder Point, FIFO: first in first out; FEFO first expired first out; SIMRS: hospital information system; SPC: statistical process control; IFRS: Hospital Pharmacy Installation.

Declarations

Ethics Approval and Consent Participant

This study has passed the ethics review from the BMEH.

Conflict of Interest

We declare that we do not conflict with anyone's interest.

Availability of Data and Materials

The availability of data and materials based on demand from journal and readers

Authors' Contribution

NWYY and PNEL conceptualised the study design and article. NWYY, GSD, and IBRS prepared the original draft of the manuscript.

Acknowledgment

First for parents, husband, and children, Then for the supervisor Dr. Ni Putu Nina Eka Lestari, MM.

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Original Research

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.150-160

THE CORRELATION AVAILABILITY NURSES AND EQUIPMENT WITH ACUTE MISSED NURSING CARE AT HOSPITALS

Hubungan Ketersediaan Perawat dan Peralatan Terhadap Acute Missed Nursing Care pada Rumah Sakit

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Abstract

Background: One of the nurse's roles is to provide nursing care regards of patient safety, consistently and timely. The availability of nurses and equipment can be considered as a primary constraint contributing to acute missed nursing care.
Aims: This study aimed to determine the correlation between the availability of nurses and equipment with incidences of acute missed nursing care in medical and surgical wards at hospitals.
Methods: This study used quantitative research with a cross sectional approach. This research was conducted at six private hospitals in Malang from October 2020 to November 2020. The population in this study were selected using consecutive sampling, and the study sample consisted of 206 nurses. The acute MISSCARE Survey was used to collect data. The relationship between the availability of the number of nurses and equipment with acute missed nursing care was analyzed by applying SPSS version 26 with the Spearman test.
Results: The relationship between the availability of nurses and acute missed nursing care yielded results of $\rho = 0.016$ (<0.05) and $R = -0.168$. Equipment availability and acute missed nursing care had values of $\rho = 0.026$ (<0.05), and $R = -0.155$. This shows correlation between the availability of the number of nurses and equipment with incidences of acute missed nursing care.
Conclusion: The availability of the number of nurses and equipment are the reasons for the incidence of acute missed nursing care. Therefore, nursing managers are needed in managing and allocating the necessary number of nurses and equipment.

Keywords: equipment, missed nursing care, nurse

Abstrak

Latar Belakang: *Salah satu peran perawat memberikan asuhan keperawatan kepada pasien dengan aman tanpa ada yang terlewatkan atau tertunda. Ketersediaan jumlah perawat dan penyediaan alat - sarana perawatan menjadi alasan terbesar terjadinya asuhan keperawatan terlewatkan atau tertunda, hal ini dapat mengurangi kualitas asuhan keperawatan yang diterima pasien.*
Tujuan: *Penelitian ini untuk mengetahui hubungan ketersediaan jumlah perawat dan peralatan dengan kejadian acute missed nursing care pada pasien ruang medikal bedah.*
Metode: *Penelitian kuantitatif menggunakan pendekatan cross sectional. Penelitian ini dilaksanakan pada enam rumah sakit swasta di Malang pada Oktober 2020 sampai November 2020. Populasi dalam penelitian ini adalah seluruh perawat ruang medikal bedah pada rumah sakit swasta di Malang dengan menggunakan consecutive sampling, sampel penelitian 206 perawat, terdiri dari 4 rumah sakit tipe B: 174 perawat, dan 2 rumah sakit tipe C: 32 perawat. Penelitian ini menggunakan alat survei MISSCARE. Analisa hubungan antar variabel ketersediaan jumlah perawat dan ketersediaan alat dengan acute missed nursing care menerapkan aplikasi SPSS versi 26.*
Hasil: *Hubungan ketersediaan jumlah perawat dengan acute missed nursing care $\rho = 0.016$ (<0.05), dan $R = -0.168$. Hubungan ketersediaan alat dengan acute missed nursing care $\rho = 0.026$ (<0.05), dan $R = -0.155$. Hal ini menunjukkan adanya hubungan antara ketersediaan jumlah perawat dan ketersediaan alat dengan kejadian acute missed nursing care.*
Kesimpulan: *Ketersediaan jumlah perawat dan ketersediaan peralatan menjadi penyebab timbulnya acute missed nursing care. Oleh karena itu, manajer perawat sangat penting dalam mengelola jumlah perawat yang tepat dan ketersediaan peralatan.*

Kata kunci*: missed nursing care, perawat, peralatan*

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
Volume 9 No.2 2021 DOI: 10.20473/jaki.v9i2.2021.150-160
Received: (2021-03-18) Revised: (2021-06-28) Accepted: (2021-07-07) Published: (2021-11-28)
Published by Universitas Airlangga in collaboration with Perhimpunan Sarjana dan Profesional Kesehatan Masyarakat Indonesia (Persakmi).

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.150-160

Introduction

One of roles is to provide nursing care to patients without missing or delaying care (Nilasari, Hariyati, and Anisah, 2020). Missed nursing care is a form of negligence towards patients (Duffy, Culp, and Padrutt, 2018). Previous study stated that missed nursing care occurs in individual interventions such as indications of patient mobilization needs, drug administration, and oral care (Winsett *et al*., 2016). Missed or delayed nursing care occurs in the nursing care process (assessment, diagnosis, planning, implementation, and evaluation) because of the patient care environment (level of patient care needs, allocation of labor resources, allocation of material resources, and relationships or communication) and the nurses themselves (team rules, decision-making priorities, internal values and beliefs, and habits) (Albsoul *et al*., 2019; Dabney, Kalisch, and Clark, 2019; Hessels *et al*., 2019).

A study at 168 hospitals in the USA by Van Fosson, Jones, and Yoder (2016) reported that missed nursing care in nursing interventions they occurred during these stage as follows: individual needs interventions, basic needs interventions, and planning. Missed nursing care has occurred in several countries, with as many as 86% of nurses in Britain and 74% of nurses in Sweden having missed nursing care at the end of their shift (Ball *et al*., 2018). Missed nursing care occurs during activities such as patient mobilization or ambulation, taking care of personal hygiene, and patient education. When this happens, emotional support for patients is eliminated or postponed in various care units (Vryonides *et al*., 2018). Meanwhile, there is no research on the incidence of acute missed nursing care in Indonesia.

The most frequently missed or delayed treatments in the medical surgery room occur during ambulation of patients, medication administered within 30 minutes, and oral care (Jones, Hamilton, and Murry, 2015). Missed care occurs due to increased patient volume, the number of patients being admitted and discharged, inadequate assistants, inadequate staff, unavailable medicine, administrative tasks, and patient care (dos Reis Dutra, Salles and Guirardello, 2019). Another study stated the nursing actions most often neglected in the medical room were entertaining or talking to patients (66%), educating patients (52%), and developing or updating nursing care plans (47%) (Duffy, Culp and Padrutt, 2018). Meanwhile, data in Indonesia shows that as many as 80% of nurses underperformed in several nursing interventions (Asmirajanti, Hamid and Hariyati, 2019). Meanwhile, in the medical surgery room, there is no research on the incidence of acute missed nursing care.

Missed nursing care is a phenomenon that can threaten patient safety and have a direct impact on the quality of patient care (Srulovici and Drach-Zahavy, 2017a; Kim, Yoo and Seo, 2018; Rabin *et al*., 2019; Cho *et al*., 2020). Missed nursing care also has consequences for nurses, such as decreased personal accountability of nurses, job satisfaction, and intention to resign or turn over (Srulovici and Drach-Zahavy, 2017b).

Missed nursing care that the patient needs are not implemented or delayed occurs in the nursing care process, and is determined by allocation of labor resources and allocation of material resources (Hessels *et al*., 2019). Several studies have stated that the variables of nurse availability and of medical tool availability were important factors in the occurrence of missed nursing care (Ball *et al*., 2016; Dabney, Kalisch, and Clark, 2019). Nursing staff composition and missed nursing care were significantly associated with an increase in nurse workload by one patient. A 10% increase in missed nursing care was associated with 7% and 16% increases in the likelihood of a patient dying within 30 days of admission to care (Ball *et al*., 2018).

Provision of equipment and means of care can be considered the greatest factors impacting the quality of healthcare, as it is impossible to provide high-quality care if equipment is not provided safety (Rabin *et al*., 2019). Nurses are essential to providing safe and effective care, but the insufficient number of nurses lead to heavy workloads, which can subsequently lead to missed nursing care (Gathara et al., 2020).

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p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.150-160

Research has shown that insufficient hospital staff resources or a lower number of nurses leads to heavy workloads during shift periods (Junttila *et al*., 2016; Jansson, Syrjälä and Ala-Kokko, 2019).

According to several studies, the incidence of missed nursing care in the medical and surgical wards to the availability of personnel and equipment, and this has a negative impact on patients and nurses. Research has not investigated acute missed nursing care in the medical and surgical wards in Indonesia. This study aimed to determine the relationship between the availability of nurses and equipment with acute missed nursing care in medical and surgical wards at private hospitals in Malang.

Method

This quantitative research used an observational-descriptive design with a cross sectional approach. The population in this study was all nurses in the surgical and medical wards at private hospitals in Malang. This study used consecutive sampling with a sample of 206 registered nurses. It was conducted at six private hospitals supported by having a medical surgery room. All the hospitals were located in Malang and investigated from October 2020 to November 2020 consisting of four type B hospitals with 174 nurses, and two type C hospitals with 32 nurses.

The study used the acute MISSCARE Survey tool containing 15 question items; namely focused review, assessment, monitoring blood sugar, documentation, monitoring vital sign, managing treatment effectiveness, skin and wound care, emotional support, monitoring of incoming and outgoing fluids, administering drugs if necessary, hand washing, intravenous access care, patient education, toileting, and schedule of drug administration. Respondents were asked to report how often certain elements of nursing care were missed using a Likert scale: A = Always Missed (1), OM = Often Missed (2), SM = Sometimes Missed (3), RM = Rarely Missed (4), and NM = Never Missed (5) (Dabney, Kalisch, and Clark, 2019). The reason MISSCARE survey tool containing 8 question item namely focused review on the availability of nurses: nurse assistants are not on duty or absent; drugs are not available when needed; the number of nurses is inadequate; the emergency condition of other patients; an unexpected increase in patients; insufficient or absent number of nursing assistants; the number of other tasks outside of nursing performed by nurses; and the number of administrative tasks; and 2 question items: focused review on the availability and functions of equipment to support nursing care . Respondents were asked to indicate the reasons for missing elements of nursing care using a Likert scale: 1 = not a causative factor, 2 = a causative factor, but at a minimum, 3 = a partial causal factor, and 4 = the main causative factor (Bragadóttir, Kalisch, and Tryggvadóttir, 2017; dos Reis Dutra, Salles and, Guirardello, 2019). The research instrument has tested the validity and reliability of the 10 respondents with the results r count = 0.68 and α = 0.6.

Respondents used an online form link to fill out the research survey, which was forwarded by the nursing managers of each hospital over a two-week period. The relationship between the availability of nurses and tools with acute missed nursing care was analyzed using the SPSS application version 26 for Windows 14. The differences in the incidences of acute missed nursing care and the demographic characteristics between the two types of hospitals were analyzed using the Wilcoxon test. The relationship between the availability of nurses and tools with acute missed nursing care was analyzed using the Spearman test. All statistical analyses were performed at the 0.05 significance level.

This study has obtained ethical eligibility from the Health Research Ethics Committee of the Faculty of Medicine, Brawijaya University Number 183/ EC/KEPK/10/2020 and a research permit from six private hospitals in Malang. In accordance with the research ethics protocol, the ethical principles included informed consent, beneficence, respect for anonymity, confidentiality, and respect.

Result and Discussion

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.150-160

The nursing process is also beneficial for patients because they participate in determining nursing planning and build cooperation in implementing nursing actions. The nursing process prevents the occurrence of duplicated actions and insufficient action, and improves high quality nursing care (Budiono, 2016; Pérez *et al*., 2017). Proper nursing care impacts both nurses and patients, and prevents duplicated actions and missed care.

The relationship between the availability of nurses and equipment with acute missed nursing care was analyzed using the Spearman test, as shown in Table 1. There was a relationship between the availability of nurses and acute missed nursing care with a negative strength (ρ value = 0.016 (<0.05); (R) -0.168 (± 0 to ± 1)). Availability of equipment with acute missed nursing care had with a negative strength (ρ value = 0.026 (<0.05); (R) -0.155 (± 0 to ± 1)), which indicates that there is a negative relationship between tool availability and incidences of acute missed nursing care. This shows a relationship between the availability of nurses and equipment with incidences of acute missed nursing care.

Inadequate staff resources or a lower number of nurses lead to heavy workloads during shifts (Junttila *et al*., 2016; Jansson, Syrjälä and Ala-Kokko, 2019). The results in Table 1 showed that there was a relationship between the availability of nurses and incidences of acute missed nursing care. The increasing unavailability of nurses is the main factor causing patient care to be missed or delayed, and it increases the incidences of acute missed nursing care. The insufficient number of nurse personnel can hinder nursing practice, and this is consistent with the results of the study that states factors in the care environment (e.g., workload due to lack of personnel) can facilitate or hinder nursing practice (Rabin *et al*., 2019). Research on hospitals in France and Finland showed that insufficient staff resources or a lower number of nurses led to heavy workloads during shift periods (Junttila *et al*., 2016; Jansson, Syrjälä and Ala-Kokko, 2019). Therefore, nursing managers need to plan for personnel requirements and handle workload problems related to nursing work in order to increase nurse productivity and satisfaction, as well as reduce turnover, work stress, and provide adequate staff for patient care needs (Alghamdi, 2016; Qureshi *et al*., 2019; Bagnasco *et al*., 2020).

Management of nursing workload and staffing is needed, especially in creating and maintaining a healthy work environment, setting practices that maximize the health and well-being of nurses, and ensuring quality patient care (Hovenga and Lowe, 2020). The components of the nursing workload identified in terms of patients, nurses, and health institutions have been divided into five main categories: total nursing time, nursing competency level, weight of patient care required, the amount of physical exertion, and complexity of treatment (Alghamdi, 2016). Effective staffing requires comprehensive nursing workload measurements to determine staffing needs,

Table 1. Analysis of the Relationship between Availability of the Number of Nurses and Availability of Equipment with Acute Missed Nursing Care in the medical and surgical wards (n = 206).

Variables	Correlation coefficients (R)	ρ-values
Number of available nurses	-0.168	0.016
Availability of equipment	-0.155	0.026

Spearman test

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handle increased workload volume, and manage the impact on nursing services at any given time (Swiger, Vance and Patrician, 2016). The high workload of nurses increases the occurrence of missed nursing care, which results in patients having a longer length of stay (Tubbs-Cooley *et al*., 2019). When nurses' resources are insufficient (e.g., insufficient practice environment and time), nurses may minimize their standard of care or share of attention across nursing activities or even across patients. This can increase the risk of adverse outcomes for patients, thereby threatening patient safety and reducing the quality of care. Nursing care priorities can be described in terms of implicit offering, in which nurses decide to withhold or not carry out the necessary nursing duties when they are deprived of nursing resources through clinical decision making and judgment.

Inadequate material resources, such as facilities and infrastructure, cause nurses to skip or delay patient nursing care (Haftu *et al*., 2019; Tou *et al*., 2020). The results of the study showed a relationship between the availability of equipment and incidences of acute missed nursing care, as shown in Table 1. The unavailability of tools is the main factor causing patient care to be missed or delayed, and it increases incidences of acute missed nursing care. The availability of physical tools and functions when needed can facilitate or can become a barrier to nursing services (Henderson *et al*., 2016; Rabin *et a*l., 2019). Therefore, it is necessary to fulfil the need for tools optimally in terms of their existence and function by the hospital as a health service provider, in order to prevent the occurrence of acute missed nursing care (Ogboenyiya *et al*., 2020; Dutra and Guirardello, 2021).

The relationship between the availability of nurses and tools with incidences of acute missed nursing care is negative. This means that if nurses perceive that the availability of nurses and tools is the main factor causing patient care to be abandoned, incidences of acute missed nursing care increase. Health services are an integral part of hospitals or health clinics. Maximum service can be achieved if the availability of resources in the service center is adequate. However, the availability of adequate resources cannot be ascertained, and excessive availability of resources can also result in waste. The problem that often occurs is the lack of optimal services provided to patients due to limited available resources. Optimal barriers to service include the repetition of unpermitted services, uncertain service distances, and service time (Pardede *et al*., 2019). The hospital must procure the equipment needed to develop and support the health system (Nkwanyana and Voce, 2019).

The work environment of nurses is associated with quality of care, mortality during patient care, and missed nursing care. The missed nursing care model shows that missed nursing care can occur at any stage of the nursing process. The model also describes the internal processes and factors that guide nurses in deciding what elements of care should be given priority, and thus resolved or overlooked (eliminated or delayed) until resources are enough available. Missed nursing care can occur due to human resources and material resources (infrastructure) factors. Missed nursing care can be caused by the factor of human resources, specifically when the number of staff members is inadequate. More staff members increase sufficiency and level of teamwork, and it reduces incidents of missed nursing care. Material resources contribute to missed nursing care when supplies or equipment do not function properly when needed, supplies or equipment are unavailable when needed, and medicine is unavailable when needed. Unbalanced patient assignment also affects missed nursing care, especially when other departments do not provide the needed care (e.g., physical therapy is not running, inadequate handover from previous shift or sending unit, lack of support from team members).

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Missed nursing care is the negligence of nursing care that is needed by patients (Pérez *et al*., 2017). Missed care occurs when a nurse is asked to perform various activities at the same time, but some activities are not carried out or are delayed (Cho *et al*., 2020). Assessment of nurses, which includes missed nursing care related to the primary assessment of nurses, which can be in the form of incomplete care, or care that is deliberately not given (Srulovici and Drach-Zahavy, 2017b).

Missed or delayed nursing care causes morbidity and mortality of patients in the surgical ward (Ball et al., 2018). Missed nursing care is a phenomenon that can threaten patient safety and have a direct impact on the quality of patient care (Srulovici and Drach-Zahavy, 2017a; Kim, Yoo, and Seo, 2018; Rabin *et al*., 2019). This can lead to negligence and commission errors in nursing actions, which is failure to take action correctly. The MISSCARE survey instrument identifies these action as lost or overlooked. The negligence of agreement forms in therapeutic transactions by health personnel can result in overlooked and unfulfilled content on the forms. This has a broad impact not only on patients and families, but also on hospitals, individual nurse perpetrators, and on the profession in the form of criminal or civil lawsuits.

The elements of nursing care in missed care have been classified into four groups: nursing assessments, basic care interventions, individual needs interventions, and planning. The planning category includes nursing assessment procedures, and the assessment procedures most frequently missed by nurses in medical and surgical wards are complete documentation of all data needed, monitoring fluid intake and output, and assessing vital signs in order. The nursing procedures most often missed in the basic care-intervention category are ambulation, changing the patient's position every two hours, and oral care. The interventions associated with individual needs that are most often missed by nurses are emotional support for the patient and family, treatment effectiveness assessment, medication given within 30 minutes before or after the scheduled time, and PRN treatment requests followed up within 5 minutes. The most frequently overlooked items of nursing care related to planning are attendance at interdisciplinary care conferences, and patient education about diseases, tests, and diagnostic procedures (Albsoul, 2019).

Missed nursing care is influenced by internal and external factors (Albsoul *et al*., 2019; Hessels *et al*., 2019). Internal factors come from the individual nurses themselves and their perceptions and internal values. External factors come from the work environment, teamwork, communication, organizational learning, workload, management support for patient safety, and available infrastructure (Bragadóttir, Kalisch, and Tryggvadóttir, 2017; Cho *et al*., 2020). The main reasons for missed nursing care in the medical surgery room are the insufficient number of nurses, the emergency condition of the patient during work shifts, and the unavailability of drugs, materials, or equipment when needed (dos Reis Dutra, Salles, and Guirardello, 2019). Low work environment accountability leads to acute missed nursing care. Factors in the care environment can facilitate or hinder nursing practices.

Table 2 shows that the nurses in the medical and surgical wards consisted of 206 nurses from 6 private hospitals in Malang. The demographic data shows 31 male nurses (15%) and 175 female nurses (85%). As many as 144 nurses (70%) were aged 30 and under, while 62 nurses (30%) were above the age of 30. Besides, 151 nurses (73%) had D3 degrees, while 55 nurses (27%) had S1 degrees in nursing. Regarding their work, 128 nurses (62%) were permanent employees, and the remaining 38 were contract nurses (40%). Furthermore, 191 nurses (93%) worked on shift schedules, while 15 nurses (7%) worked on non-shift schedules. Lastly, 117 nurses (57%) had worked for five years or

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p-ISSN 2303-3592, e-ISSN 2540-9301
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less, and 89 nurses (43%) had worked for over five years. In terms of marital status, 139 nurses (67%) were married, and 67 nurses (33%) were unmarried.

Table 2 shows the demographic characteristics data obtained from the respondents. There was a difference of ρ value = 0.016 (≤0.05) in incidences of acute missed nursing care between permanent and contract employees. Incidences of acute missed nursing care was higher among permanent employees (mean = 41.19) than contract employees (mean = 35.38). Hospital unit characteristics and nurse characteristics may be indicators of the acute missed nursing care phenomenon. Staffing competence is a key mechanism that affects the quality of patient care.

There is a difference that can be seen in the occurrence of acute missed nursing care from the demographic data of employment status. The incidences of acute missed nursing care based on permanent employment status is greater than that of contract employees, as shown in Table 2. This is in accordance with the results of research that associated missed care with several factors from the perception of nurses based on demographic data, namely the number of nurses' children, years of experience working as a nurse, the assignment unit, and the level of satisfaction with the profession (Bragadóttir, Kalisch and Tryggvadóttir, 2017; Alshammari *et al*., 2020). Therefore, nurse managers must plan actions to reduce the nursing workload through teamwork, as well as improve patient safety culture and job satisfaction by developing solutions for nurses to feel empowered (Metcalf, Wang, and Habermann, 2018; Bacaksiz *et al*., 2020; Dutra and Guirardello, 2021).

Table 2. Demographic Characteristics of Respondents to the Incidences of Acute Missed Nursing Care in the medical and surgical wards (n = 206).

Respondent characteristics	Frequency	Percentages	ρ-values
Gender			0.450 (>0,05)
Male	31 nurses	15%	
Female	175 nurses	85%	
Age			0.400 (>0,05)
≤ 30 years	144 nurses	70%	
>30 years	62 nurses	30%	
Educational stage			0.723 (>0,05)
Diploma 3 of Nursing	151 nurses	73%	
Bachelors of Nursing	55 nurses	27%	
Employment status			0.016 (≤0,05)
Permanent employees	128 nurses	62%	
Contract employees	38 nurses	40%	
Work schedule			0.232 (>0,05)
Shift	191 nurses	93%	
Non-shift	15 nurses	7%	
Length of working			0.296 (>0,05)
≤5 years	117 nurses	57%	
>5 years	89 nurses	43%	
Marital status			0.312 (>0,05)
Married	139 nurses	67%	
Single	67 nurses	33%	
Hospital type			0.259 (>0,05)
Type C hospital	32 nurses	16%	
Type B hospital	174 nurses	84%	

Wilcoxon test

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p-ISSN 2303-3592, e-ISSN 2540-9301
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Nurses' decisions to eliminate or delay certain care activities are also influenced by nurses' intrinsic perceptions of the process in terms of team norms, decision-making practices and embedded values, beliefs, habits, and attitudes through which nurses perceive their roles and responsibilities. Low personal accountability leads to the occurrence of missed nursing care (Srulovici and Drach-Zahavy, 2017b). When the level of competency of nursing staff is low, the potential for acute missed nursing care increases due to a lack of time in patient management experience. The foundations of nursing ethics are to save human lives, to protect patients from harm, to respect human rights, and to create patient safety, high quality service, and dignified, caring, and comprehensive care for patients without discrimination (Vryonides *et al*., 2018). Patient safety culture is a vital health component in the quality of care, characterized by a healthcare provider's perspective on the importance of safety, and a belief in the effectiveness of patient care outcomes and remedial actions.

Conclusion

Missed nursing care occurs when nursing care is postponed, partially completed, or not completed at all. The occurrence of missed nursing care is determined by human resources and material resources (equipment availability). This study shows that there is a relationship between the availability of nurses and tools with incidences of acute missed nursing care in the medical and surgical wards. Heavier workload and unavailability of tools are considered by nurses as the main causes of patient nursing care being missed, and these factors increase incidences of acute missed nursing care.

Proper nursing care will impact both the nurse and the patient, for example preventing duplicated actions and missed care. Provision of care can be considered an indicator of the quality of health services. It is impossible to provide high quality care if both manpower and equipment are not available enough. Therefore, it is the duty of every health institution to reduce the likelihood of injury to patients by providing adequate care. Nursing quality is an important factor in ensuring patient safety because nursing care that is below standard directly leads to the occurrence of missed nursing care during treatment. This shows the need for human resource management interventions in the form of nursing managers allocating appropriate workloads to reduce the occurrence of acute missed nursing care. The availability of tools determines the quality of patient care, therefore the availability of physical and functional tools is also expected to reduce the occurrence of missed nursing care.

Abbreviations

Not applicable.

Declarations

Ethics Approval and Consent Participant

This study has obtained ethical eligibility from the Health Research Ethics Committee of the Faculty of Medicine, Brawijaya University.

Conflict of Interest

The authors states that there is no conflict of interest in this article.

Availability of Data and Materials

Data and material research can be provided by upon request.

Authors' Contribution

KRP, AB and FMD conceptualized the study; ADR created the methodology; FMD, AB, and ADR wrote, reviewed, and edited the manuscript; KRP and FMD wrote the original draft.

Acknowledgment

We would like to thank the Management and Nursing Leadership Department, Universitas Brawijaya and Nursing Manager at the Private Hospitals, for their technical support and all the contributors to this study.

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Literature Review

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.210-217

BARRIERS TO REPORTING PATIENT SAFETY INCIDENT IN HEALTH CARE WORKERS: INTEGRATIVE LITERATURE REVIEW

Hambatan Pelaporan Insiden Keselamatan Pasien Pada Tenaga Kesehatan: Integrative Literature Review

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Abstract

Background: The patient safety incident reporting systems is designed to improve the health care by learning from mistakes to minimize the recurrence mistakes, however the reporting rate is low.
Aims: Integrative literature review was chosen to identify and analyze the barriers of reporting patient safety incidents by health care workers (HCWs) in hospital.
Methods: Searching for articles in electronic database consisting of Medline, CINAHL and Scopus resulted in 11 relevant articles originating from 9 countries.
Results: There are differences but similar in barriers to reporting patient safety incident among HCWs. The barriers that occur are the existence of shaming and blaming culture, lack of time to report, lack of knowledge of the reporting system, and lack of support from the management.
Conclusion: Each hospital has different barriers in reporting incident and the interventions carried out must be in accordance with the existing barriers.

Keywords: barrier of reporting, incident reporting, patient safety incident

Abstrak

Latar Belakang: *Sistem pelaporan insiden keselamatan pasien dibuat agar rumah sakit dapat mempelajari insiden yang terjadi sehingga meminimalisir terulangnya kesalahan yang sama, namun angka pelaporan dari tenaga kesehatan dirasa belum optimal.*
Tujuan: *Integrative literature review dipilih untuk mengidentifikasi dan menganalisis hambatan yang terjadi pada tenaga kesehatan dalam melaporkan insiden keselamatan pasien di rumah sakit.*
Metode: *Pencarian artikel dalam basis data elektronik yang terdiri dari Medline, CINAHL dan Scopus menghasilkan 11 artikel yang relefan dan berasal dari 9 negara.*
Hasil: *Hambatan dalam pelaporan insiden keselamatan pasien pada tenaga kesehatan memang beragam namun memiliki kemiripan. Hambatan yang terjadi ialah adanya budaya shaming dan blaming, kurangnya waktu untuk melapor, kurangnya pengetahuan tentang sistem pelaporan, dan kurangnya dukungan dari manajemen.*
Kesimpulan: *Setiap rumah sakit memiliki hambatan yang berbeda-beda dalam pelaporan insiden dan intervensi yang dilakukan harus sesuai dengan hambatannya.*

Kata kunci*: hambatan pelaporan, pelaporan insiden, insiden keselamatan pasien*

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
Volume 9 No.2 2021 DOI: 10.20473/jaki.v9i2.2021.210-217
Received: (2021-05-21) Revised: (2021-08-10) Accepted: (2021-09-08) Published: (2021-11-28)
Published by Universitas Airlangga in collaboration with Perhimpunan Sarjana dan Profesional Kesehatan Masyarakat Indonesia (Persakmi).

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.210-217

Introduction

In the world of health, anything that has the potential to cause injury to patients must be watched out by health care workers (HCWs). They must record and communicate the incidents that were seen and carried out. Incident reporting is included in the patient safety program because it is a learning system that will lead to improving patient safety and security for HCWs at hospital (World Health Organization, 2020).

Patient safety incident (PSI) reporting is one of the hospital indicators, but it is not done consistently even though HCWs are aware that there is a reporting system in their workplace. Errors in health services are the result of weaknesses in a work system. To produce the right solution, it is necessary to identify the root cause of the error. One way that can be done is to report patient safety incidents internally and externally because incident is a tool to detect problems related to patient safety in the hospital.

The patient safety incident reporting system is the monitoring and prevention of injury to patients. The purpose of the reporting system is to learn from mistakes so as to minimize the recurrence of the same mistakes (Samsiah *et al.*, 2016) (M. Christopher, 2016) (Dhamanti, *et al.*, 2020)

HCWs play an important role in PSI reporting, but the information is not fully understood. In Malaysia, the number of reported incidents is lower than the actual number of incidents. Medication errors were estimated to only around 28.9%-50%. Research in Saudi Arabia demonstrated 79% of the incidents were unreported because HCWs had difficulties in reporting them (Samsiah *et al.*, 2016).

Doctors tend to only report serious incidents when compares to nurses and pharmacists who also report near miss (Samsiah *et al.*, 2016). In Iran, even though the reporting system has been made anonymously, around 45% of nurses are still reluctant to report it (Fathi *et al.*, 2017). In Indonesia, a total of 1,227 hospitals have been accredited, but only 668 incidents were reported in 2016, whereas when compared to Taiwan, every year there are 50.000 incidents reported (Dhamanti, *et al.*, 2020).

Hospital leaders need to show a positive attitude towards incident reporting because it leads to improving the quality and safety of patients in the hospital. The first step can be done by building awareness among HCWs of the importance of reporting and definition of incidents that need to be reported. The percentage of the reported number can be displayed to all HCWs and used as an indicator of quality in the hospital (Fathi *et al.*, 2017).

The three important stages in incident reporting are awareness and knowledge of the reporting system, the ability to recognize reported incidents, and the ability to handle incidents so they don't happen again (Dhamanti, *et al.*, 2020). An integrative literature review was chosen to identify and analyse the barriers that occur in HCWs in reporting PSI in the hospital.

Analysis and Discussion Literature Search

The search for articles was sourced from electronic database journals consisting of Medline, CINAHL, and Scopus using Boolean techniques in keyword searches "Patient Safety Incident AND Reporting Barriers" with publication period of journal articles from 2016 to 2020.

In the first stage of the search, there were 450 articles with 44 duplicates. The next stage after reading the title and abstract resulted in 37 articles. After adjusting to the inclusion criteria, the final results of the 11 articles were analysed in this study and stored in Mendeley to be read in full text. Table 1 illustrates the number of articles identified in each database. A peer review process of some articles took place to minimize bias. Issues found on the articles were then identified.

Inclusion and Exclusion Criteria

The inclusion criteria used were original research journal articles and reviews in English which could be accessed in the full text, the study population was HCWs and the results of the research were the barriers of reporting on PSI.

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p-ISSN 2303-3592, e-ISSN 2540-9301
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Table 1. Search Strategy

Base	Terms	Number of Publications	Studies Included
Medline	patient safety reporting barrier AND (fulltext:("1" OR "1") AND db:("MEDLINE")) AND (year_cluster:[2016 TO 2020])	73	4
CINAHL	Full Text; Published Date: 20160101-20201231; Abstract Available; English Language; Exclude MEDLINE records; Publication Type: Academic Journal; Document Type: Article	258	2
Scopus	ABS (patient AND safety AND reporting AND barrier) AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2016)) AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "re"))	117	4

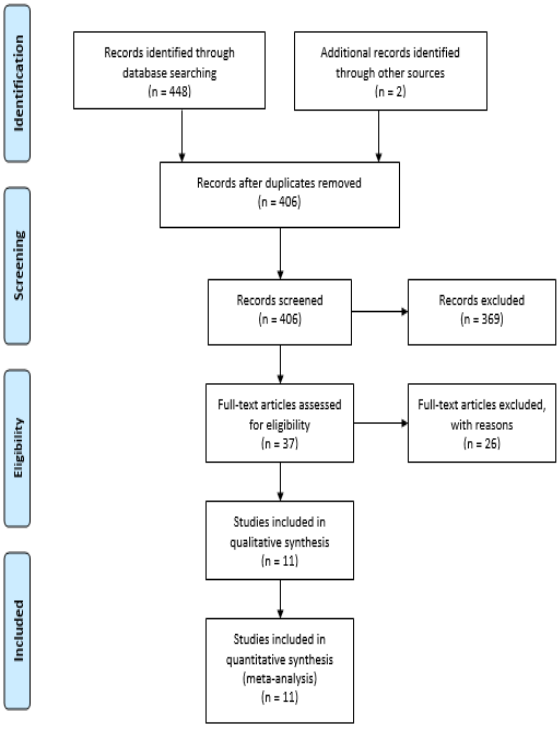

Figure 1. PRISMA flow diagram of search and selection process

Data Extraction

This integrative literature review uses a flowchart form Preferred Reporting Items for Systematic Review & Meta-Analysis (PRISMA) so that article selection can be carried out more systematically as shown in Figure 1.

There were 11 articles that matched the inclusion criteria. The characteristics of the articles are depicted in Table 2. Among the 9 identified countries (UK, Norway, Uganda, Brazil, Iran, Malaysia, Qatar, United States, and Indonesia), the barriers to reporting PSI in HCWs are similar to one and another.

In the Table2, the result of article extraction shows that the barriers by the majority of HCWs are shame and fear of being blamed when PSI occurs.

Other barriers are the lack of time to report due to high workload, did not understanding how the reporting system is, a work environment that does not support a reporting culture, not knowing what to report, and the perception that incident reporting is not their responsibility.

The barriers for HCWs in reporting PSI actually vary from one hospital to another. The strategy developed must be in accordance with the constraints so that will be more focus on the problem (Fathi *et al.*, 2017).

To prevent errors in future care, the hospital must be aware of the problems that occur and act according to the result obtained from incident reporting (M. Christopher, 2016)

Incident reporting systems must be made in a good way (De Fatima *et al.*, 2019). Because incident reporting and the result analysis are useful for increasing awareness of patient safety culture. Analysis is an important part of incident reporting because it determines the causes of incidents and prevents them from recurring (Rea & Griffiths, 2016).

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Table 2. Characteristics of Studies

Title	Authors, Year of Publication, Country	Research Methods	Research Sample	Barriers in PSI Reporting
Barriers to Reporting of Adverse Drugs Reactions: a Cross Sectional Study among Community Pharmacists in United Kingdom	(Cheema *et al.*, 2017), UK	Cross-sectional design with online and offline questionnaires	138 pharmacists	Lack of time (46.4%), perceived serious incidents to be reported (65.2%), and no need for reporting (37.0%)
Medication Errors and Safety Culture in a Norwegian Hospital	(Waaseth *et al.*, 2019), Norwegia	Qualitative method with semi-structured interviews	Seven informants (2 doctors, 4 nurses, and 1 pharmacist)	Unable to understand electronic reporting systems, lack of reporting time, poor safety culture, and lack of management support
Patient Safety in Primary Care: Incident Reporting and significant event Reviews in British General Practice	(Rea & Griffiths, 2016), UK	Qualitative method with semi-structured interviews	9 general practitioners	Lack of reporting time, inadequate understanding of what and who to report, shame and fear, and lack of feedback
Practice, Perceived Barriers and motivating Factors to Medical-Incident Reporting: A Cross-section Survey of Health Care Providers at Mbarara regional referral Hospital, Southwestern Uganda	(Naome *et al.*, 2020), Uganda	Cross-sectional design with questionnaire	158 healthcare workers	Lack of knowledge (52.5%), absence of incident management team at the hospital (53.8%), failure to maintain confidentiality of reports (58.9%), lack of support from management (43.0%), blaming culture (40.5%), and administrative penalties (65.2%).

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p-ISSN 2303-3592, e-ISSN 2540-9301
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Incidents Reporting: Barriers and Strategies to Promote Safety Culture	(Varallo *et al.*, 2018), Brazil	Group conversation	67 people consisting of nutritionists, physiotherapists, psychologists, pharmacists, therapists, doctors, and nurses	Lack of accountability for reporting culture
Medication Errors among Nurses in Teaching Hospitals in the West of Iran: What We Need to Know about Prevalence, Types, and Barriers to Reporting	(Fathi *et al.*, 2017), Iran	Quantitative method with questionnaires	500 nurses from seven hospitals	High workload and worry about consequences for reporting
Perceptions and Attitudes towards Medication Error Reporting in Primary Care Clinics: A Qualitative Study in Malaysia	(Samsiah *et al.*, 2016), Malaysia	Qualitative method with in-depth interviews	31 healthcare workers	Overlapping reporting systems, high workload, and lack of information about how to report
Barriers to Patient Safety Incident Reporting by Brazilian Health	(De Fatima *et al.*, 2019), Brazil	Integrative review	8 journal articles using a sample of nurses	Fear (62.5%), overwork (25.2%), forgetting to report (22.6%), embarrassment (27%), lack of knowledge (37.5%), and lack of responsibility (50%)
Exploring Facilitators and Barriers to Medication Error Reporting among healthcare Professionals in Qatar Using the theoretical Domains framework: A Mixed-Methods Approach	(Stewart *et al.*, 2018), Qatar	Sequential explanatory mixed methods with questionnaires and FGD	1.604 questionnaire respondents (67.9% nurses, 13.3% doctors, 12.9% pharmacists) dan 44 FGD participants	Concern about work relationship and confidentiality of reports
Improving Incident Reporting mong Physician Trainees	(M. Christopher, 2016), Amerika Serikat	Experimental study	73 resident doctors	Lack of understanding about the reporting system (72.6%), what

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p-ISSN 2303-3592, e-ISSN 2540-9301
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				to report (56.2%), and insufficient time to report (42.5%)
Practical and Cultural Barriers to Reporting Incidents Among Health Workers in Indonesian Public Hospitals	(Dhamanti, *et al.*, 2020), Indonesia	Mixed method with convergent parallel design	1,121 health personnel as respondents and 27 hospital managerial staff as informants	Lack of understanding of the reporting system, lack of feedback, fear and complicated reporting system

The literature review comes up with four reasons on why the PSI reporting was not smoothly run.

Shaming and Blaming Culture

Shaming and blaming culture may worsen PSI reporting culture (Naome *et al.*, 2020). A positive culture is necessary to build individual's awareness of reporting incidents (Samsiah *et al.*, 2016).

Culturally, HCWs tend to avoid conflicts with others, i.e., friends and superiors (Dhamanti, *et al.*, 2020), and thus they do not conduct any reporting habits. Naome *et al.* (2020) figured out of 158 respondents, 110 (69.6%) favored a work environment without blaming and shaming culture to encourage compliance with incidence reporting.

Further, Christopher (2016) asserted that interactive incidence reporting training would be very important to promote patient safety culture. To compensate this idea, Dhamanti *et al.* (2020) stated that effective communication within an organization could overcome cultural barriers.

Organization with high incidence reporting rates already have a good perception of patient safety culture (M. Christopher, 2016).All leaders, HCWs, and other staff must be proactive in promoting and implementing a reporting culture (Cheema *et al.*, 2017).

Lack of time

The high number of patients sometimes does not align with the number of nurses available. The same issue also happened at several hospitals in the provinces of Iran, Taiwan, and Germany (Fathi *et al.*, 2017). Samsiah *et al.* (2016) demonstrated HCWs mostly spent their time for caring for patients and did not prioritize reporting role.

Another study conducted by Waaseth *et al.* (2019) mentioned HCWs were too busy during shifts and thus having no time to report incidents. Although the management allows them to report incidents on the next day, most of them forgot to report the incidents. Therefore, strategies should be implemented to reduce their workload (Fathi *et al.*, 2017). A simple and accessible reporting system both manual and web-based could trigger staff motivation to report incidents (Rea and Griffiths., 2016; Waaseth *et al.*, 2019).

Lack of knowledge

Another barrier is disability to define and report the incidence chronology. Research in Malaysia demonstrated HCWs had no idea to report incidents (Samsiah *et al.*, 2016). In the UK, only 45% of pharmacists reported adverse drug reactions (ADR). They perceived only serious incidents should be reported (Cheema *et al.*, 2017). However, any medical errors mainly become common incidents that occur (M. Christopher, 2016).

Many countries have developed incident reporting tools nationwide. However, it might be that as Samsiah *et al.* (2016) stated, reporting systems could be overlapping and become another barrier. For example, the Malaysia Ministry of Health (MOH) introduced a system called the Medication Error Reporting System

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p-ISSN 2303-3592, e-ISSN 2540-9301
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(MERS) in August 2009. Apart from MERS, there are also IQ, QAP, and PF statistics which confuse most of the HCWs.

In Brazil, since 2013, hospitals have been called on to report incidents as the country wants to bolster patient safety (De Fatima *et al.*, 2019). The University Hospital of North Norway used a web-based reporting management system, but not all staff could access to the system which was not integrated to all units.

Training on incidence reporting is required for all staff to emphasize on what have been taught (Waaseth *et al.*, 2019). Reporting should be easy, not bureaucratic, and free of hierarchy (De Fatima *et al.*, 2019). Sustainable training will keep HCWs to get used to incidence reporting (Samsiah *et al.*, 2016).

In Uganda, 55.7% of respondents should go on training on incidence identification, and 60.1% needed written guidelines. Educative media about how to report incidence are prominent for the staff (Naome *et al.*, 2020). For example, hospital management can provide an incident reporting flowchart to give more simple incidence reporting procedures (Samsiah *et al.*, 2016).

Several hospitals in Indonesia routinely hold training on safety and incidence reporting programs. However, they did not expel any optimum results. Socialization on the system has to reach all units at the hospital (Dhamanti, *et al.*, 2020).

Lack of support

Leader commitment to PSI reporting is another factor that contributes to the success of the system. Waaseth *et al.* (2019) mentioned that doctors and nurses perceived poor commitment to incidence reporting existed in the managerial level.

The absence of rewards and appreciation is another reason on why staff is unaware of incidence reporting. As a result, staff does not make any positive change (De Fatima *et al.*, 2019).

Dhamanti *et al.* (2020) indicated 52% of respondents received no feedback from their leaders. Meanwhile, according to Samsiah *et al.* (2016), feedback across organization's units positively cultivates staff's interests in continuous incidence reporting. Moreover, it will increase motivation and compliance with incidence reporting (Naome *et al.*, 2020). Lack of responsibility from HCWs is the other barrier in PSI reporting. To achieve goals in incidence reporting, leaders must address staff with educational interventions where knowledge is transferred actively (Varallo *et al.*, 2018).

Conclusion

PSI reporting is essential for patient safety programs to avoid recurrent mistakes. The barriers that occur are the existence of shaming and blaming culture, lack of time to report, lack of knowledge of the reporting system, and lack of support from the management.

Stakeholders and policy makers require incident reports to reduce the impacts of PSI. Further research needs to be done using more samples in various countries to further collect more data on incidence reporting culture.

Abbreviations

HCWs: healthcare workers; PSI: patient safety incidents.

Declarations

Conflict of Interests

The authors declare that there is no conflict of interests that might have affected the performance.

Availability of Data and Materials

Data and materials are available in an open data repository (Institutional Repository Data).

Authors' Contribution

All of the authors conceptualized the study. DAN wrote the manuscript and AW reviewed the manuscript. Author and co-author discussed the issues together.

Acknowledgment

We would like to thank the Faculty of Public Health, Universitas Airlangga and all contributors for supporting our research.

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p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.210-217

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Literature Review

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.202-209

ECONOMIC EVALUATION FOR HEALTH ADVOCACY AND INFORMED POLICY

Evaluasi Ekonomi untuk Advokasi Kesehatan dan Kebijakan yang Diinformasikan

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Abstract

Background: Healthcare resources are limited therefore, adequate, appropriate and timely allocation of resources are important. Decision to invest on health care program can be made from the analysis of the information obtained on the cost and consequences of the various alternative health programs, often known as economic evaluation of health interventions.
Aims: This write-up emphasizes on the importance of evidence driven policy of health intervention whereby economic evaluation should be performed to indicate whether investment on health intervention would benefit the country.
Methods: Literature review on economic evaluation studies conducted by the first author during her 14 years tenure as academician had been performed. Various studies which applied the cost-effectiveness analysis tools to economically evaluate health interventions and programs in Malaysia and other countries are shared.
Results: The economic evaluation studies cut across different programs such as disease prevention and treatment, public health monitoring and control, and implications of health issues to the healthcare system. Many of the findings have been used for advocacy to shape the delivery of more effective health intervention programs in the country.
Conclusion: The country will benefit from economic evaluation studies which could provide evidence to assist in policy making on health programs for the country.

Keywords: economic evaluation, health programs, policy making.

Abstrak

Latar Belakang: *Alokasi sumber daya kesehatan yang memadai sangat penting karena sumber daya kesehatan yang terbatas. Keputusan untuk berinvestasi pada program perawatan kesehatan dapat dibuat dari analisis informasi yang diperoleh tentang biaya dan konsekuensi dari berbagai program kesehatan alternatif, yang disebut sebagai evaluasi ekonomi intervensi kesehatan*
Tujuan: *Tulisan ini menekankan pada pentingnya kebijakan intervensi kesehatan berbasis bukti dimana evaluasi ekonomi harus dilakukan untuk menunjukkan apakah investasi pada intervensi kesehatan akan menguntungkan negara.*
Metode: *Tinjauan pustaka tentang studi evaluasi ekonomi yang dilakukan oleh penulis pertama selama 14 tahun masa jabatannya sebagai akademisi. Penelitian yang dibahas adalah berbagai studi yang menerapkan instrumen analisis efektivitas biaya untuk mengevaluasi intervensi dan program kesehatan secara ekonomis di Malaysia dan negara-negara lainnya*
Hasil: *Studi evaluasi ekonomi melintasi berbagai program seperti pencegahan dan pengobatan penyakit, pemantauan dan pengendalian kesehatan masyarakat, dan implikasi masalah kesehatan terhadap sistem perawatan kesehatan. Banyak hasil penelitian yang telah digunakan untuk advokasi membentuk pelaksanaan program intervensi kesehatan yang lebih efektif di negara ini.*
Kesimpulan: *Negara akan mendapatkan manfaat dari studi evaluasi ekonomi dengan memberikan bukti untuk membantu dalam pembuatan kebijakan program kesehatan untuk negara.*

Kata kunci*: evaluasi ekonomi, pembuatan kebijakan, program kesehatan.*

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
Volume 9 No.2 2021 DOI: 10.20473/jaki.v9i2.2021.202-209
Received: (2021-07-23) Revised: (2021-08-20) Accepted: (2021-08-31) Published: (2021-11-28)
Published by Universitas Airlangga in collaboration with Perhimpunan Sarjana dan Profesional Kesehatan Masyarakat Indonesia (Persakmi).

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.202-209

Introduction

Globally, economic evaluation is gaining prominence as a potential tool for advocacy in health care programs. Economic evaluations can inform decisions concerning the efficiency and allocation of resources to implementation strategies which are explicitly designed to inform care providers and patients about the best available research evidence and to enhance its use in their practices. These strategies are increasingly popular in health care, especially in the light of growing concerns about quality of care and limitation of resources. However, such concerns have hardly driven health authorities and other decision-makers to spend on some form of economic evaluation in their assessments of implementation strategies.

Economic evaluation strives to analyze inputs (health resources) and outputs (changes in health outcomes) concurrently and thus provide the decision/policy maker a yardstick as to whether the outputs level achieve worth the number of resources used to produce it, bearing in mind that resources are scarce and have alternative uses (Drummond *et al.*, 1998). It provides basis for decision between alternative strategies, programs or projects that have different costs and consequences. This helps in ensuring that the limited resources are properly allocated such that the benefits of such programs are worth the costs.

The goals of economic evaluation are to measure efficiency, or the value of money utilized on one health intervention program in comparison to another and also to provide advice to decision-makers or stakeholders on health care intervention program; thus, help in the healthcare resources allocation. Decision on health care program can be made based on the information obtained on the cost and consequences (outcome) of the various alternative health programs/ strategies (Cunningham, 2000). Morris *et al.* (2012), advanced four reasons for employing economic evaluation in health care decision making thus: 'maximization of benefits from health care spending; overcoming regional variations in access; to contain costs and manage demand; to provide bargaining power with suppliers of healthcare products'.

Economic evaluation starts with assessing the effectiveness of a program and its alternative. Evaluation encompasses the set of tools that are used to measure the effectiveness of public health interventions by determining what works. Traditional evaluations in public health have focused on assessing the impact of specific program activities on defined outcomes. Economic evaluation entails a sound evaluation on the effectiveness of a health programs before incorporating the cost to determine which of the intervention is cost-effective. Ideally, we should perform cost-effectiveness analysis on a health intervention before a policy is made on its implementation. Since performing such analysis can be difficult, often determining the effectiveness and cost of intervention separately would be sufficient when data are not complete (Drummond *et al.*, 1998).

This write-up is on the various economic evaluation that were conducted throughout the tenure of the first author as an academician which cut across different programs such as disease prevention and treatment, public health monitoring and control, and implications of health issues to the healthcare system. This write-up emphasizes on the importance of evidence driven policy of health intervention whereby economic evaluation should be performed to indicate whether investment on health intervention would benefit the country. Many of the findings have been used for advocacy to shape the delivery of more effective health intervention programs. The sharing of the studies aims to encourage the young researchers to conduct economic evaluation studies with policy implications.

Analysis and Discussion

Economic evaluation should be performed on health programs that are proven to be effective. Often economic evaluation is performed when decision has to be made in selecting a health program among several programs. However, there are situations in which we need to decide

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.202-209

whether programs that had been implemented for decades should be continued. This warrants a study to evaluate its effectiveness before new health programs can be introduced. A good example of evaluating the effectiveness of a program could be seen from a study which was conducted to assess the adequacy of care and pregnancy outcomes for the different risk groups among women attending antenatal care at public health facilities in Malaysia (Yeoh *et al.*, 2015). The program had been in place for decades and there is a need to study whether the schedule for visits and content of check-up would need to be improvised. It was observed that the usual risk-oriented approach often results in a tendency to focus on the risk conditions of the women resulting in disproportionate utilization of antenatal care according to risk level. From the study, it was concluded that the existing antenatal care warrants for better scheduling and improvement of its contents (Yeoh, Hornetz and Dahlui, 2016).

Many policies had been developed and adopted to combat obesity and NCD in general. However, the effectiveness of the planned health interventions would not be possible if implementation is not carried out accordingly. Therefore, a study was conducted to determine the availability and assess level of implementation of policies for prevention of obesity among children in Malaysia. It was found that relevant policies on obesity prevention are adequate however their implementation need improvement especially by the school canteen operators (Chan *et al.*, 2018). Once implementation of the program has been established, evaluation of their effectiveness can be performed. However, the planning for the evaluation should be made even before the implementations take place so that relevant data would not be missed.

It is imperative to quantify the burden of diseases before the application of any intervention so that the effectiveness of the proposed intervention could be assessed. The estimation of Hepatitis C as a disease burden to the Malaysia (McDonald *et al.*, 2014) had been conducted so that economic analysis can be performed to determine the most cost-effective treatment of Hepatitis C patients in our country. Similarly, assessing the change in the trends of HIV as a disease burden was long overdue; the Harm Reduction Program (HRP) for HIV under the National HIV Control Strategies had been implemented for decades and the World Health Organization (WHO) need to decide whether the financial assistance given for the program is worth to be continued. The study had showed that HRP had reduce the incidence of HIV in the country (Hiebert *et al.*, 2020) and the evidence had been updated recently (Naning *et al.*, 2014). Thus, sponsored by the World Bank, an economic evaluation was conducted in collaboration with researchers from Australia to study whether there was return of investment of the HRP to the country. The researchers had justified that the program is worthy to continue as every 1 Ringgit Malaysia (RM) spent, there is 10 cents in return from direct medical cost which will become RM1.07 in 10 years' time (Hiebert *et al.*, 2020).

It is important to know the cost of any consequences; either a disease or the intervention to treat or prevent a disease. It starts with identification of the type and assessing the quantity of resources used. With those, the cost could be estimated, and subsequent allocation and distribution of resources could be planned. An elaborated cost study was performed to determine the cost and cost predictors of patients undergoing percutaneous coronary intervention (PCI) at University Malaya Medical Center (UMMC), in comparison with other cardiac centers in Malaysia. There are many PH implications derived from the findings of this study. On the government side, it provides evidence on cost-effectiveness of PCIs and how prioritization of budget and allocation of personnel should be made (Lee, Ong, *et al.*, 2017). These are important to maintain an equitable basis for financing health services in the face of escalating health care cost. For the participating cardiac centers, the comparative analysis of clinical and cost management was able to show the areas of improvement that are necessary to improve efficiency of service provision (Lee, Azman, *et al.*, 2017).

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p-ISSN 2303-3592, e-ISSN 2540-9301
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Getting the cost of a program or treatment faces many obstacles not only because of the lack of data and appropriate accounting system but also because confidentiality and sensitivity are issues which need to be considered. However, cost finding is important since it a part of cost-effectiveness analysis. A cost analysis was performed at UMMC, a teaching hospital in 2012 to determine the cost per diem at the various wards, the day-care and for outpatient visit (Dahlui, Wan and Koon, 2012). This cost had been utilized to obtain the cost for treatment of several diseases treated at UMMC such as the cost to treat breast cancer, upper gastrointestinal adverse events in rheumatoid patients (Pok *et al.*, 2021) and in determining whether HLA-B*15:02 screening is a cost-effective option among relatives of breast cancer patients (Chong *et al.*, 2017).

The aim of economic evaluations of health care programs is to serve as an aid to decisions and to affect policymaking. If economic evaluations of health care programs are not going to have any impact on decisions on the allocation of resources to health care interventions, this is a pointless activity. Economic evaluations are used as aids to the development of treatment guidelines, judgements within healthcare organizations, introduction of new medical technologies, reimbursement decisions, and pricing decisions. Before a decision is made on whether a particular intervention i.e pharmaceuticals can be reimbursed, there is a need to ensure that the intervention is cost-effective, and that the cost-effectiveness threshold as determined by the sponsor is met. The World Health Organization had recommended that cost-effectiveness information, including thresholds, should be used alongside other findings, such as budget impact analyses and feasibility studies in the adoption or reimbursement of any health interventions (Bertram *et al.*, 2016). Several European countries including France and Australia had used cost-effectiveness information alongside other types of information to aid different policy decisions especially on the reimbursement of pharmaceuticals from public funds (Hailey, 1997; Le Pen, 1997), 18. A full economic evaluation looks at the benefits and the cost in obtaining the benefits, simultaneously. Evidence of efficiency derived from an economic evaluation of a health program can play a significant role in priority settings and coverage decisions of such a program. Three basic approaches to economic evaluation are cost-effectiveness analysis (CEA), cost-utility analysis (CUA), and cost-benefit analysis (CBA) (Drummond *et al.*, 1998; Cunningham, 2001).

The first full economic evaluation that the first author had conducted was in 2005 as her PhD thesis to determine whether it would be more cost-effective for Ministry of Health (MOH) to subsidize Desferrioxamine (iron chelator drug) to Transfusion-Dependent Thalassemia Patients (TDTP). The findings showed that although the drug was expensive, Quality of Life scores were higher among TDTP on Desferrioxamine compared to none and that the cost to treat the complications of iron overload was much higher than the cost to treat TDTP with Desferrioxamine (Dahlui *et al.*, 2007; 2009). The MOH had considered these findings to justify in getting the drug listed and since 2010 Desferrioxamine is available for free at all government hospitals in Malaysia.

Libya as a developing country was burdened with a high incidence of diarrhoea among her children, of which majority was due to rotavirus infection especially in children under 5 years old. To justify for application of financial assistance from WHO for rotavirus vaccination program in the country, together with a local researcher, a CEA of introducing Rotavirus Vaccine in Libya was conducted. The findings revealed that rotavirus vaccination would be a very cost-effective program to reduce the incidence of rotavirus infection and diarrhoea in general (Alkoshi *et al.*, 2015; Alkoshi, Maimaiti and Dahlui, 2014). These findings led to the Libyan government decided to provide the vaccine for free to all children below 5 in Libya, even without financial aids from WHO.

In 2012 MOH, Malaysia wanted to increase the uptake of PAP smear as cervical screening among women in the population, and a pilot project was conducted in the heavily populated Klang district of Selangor whereby women in the

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p-ISSN 2303-3592, e-ISSN 2540-9301
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community were called to attend cervical screening via letter; similar to what had been done under UK NHS. Thus, a CEA was conducted to compare the various mode of calling women to come for PAP smear and the study found that between the invitation via letter posted, registered letter, sending message via SMS and talk to them via telephone call, the women would respond better if they were invited via phone as talking to them personally made them feel that they are cared for (Abdul Rashid *et al.*, 2014).

In 2015, an economic evaluation had also been conducted to determine the cost of various breast cancer screening types in Malaysia and to see whether its worth for MOH to provide mammogram as a community screening for breast cancer. We found that the current practice of clinical breast examination (CBE) followed by mammography when abnormality is detected, was still relevant and mammogram of women with risks would be more cost-effective than to implement mammogram as community screening of breast cancer. This is because mammogram machine is expensive and the healthcare system had no adequate health personnel (radiographer and radiologist) to perform the screening. It is recommended that efforts should be focused on improving the participation rate for CBE and increasing the budget allocation for mammogram performed on women with breast abnormality and women with risk factors of breast cancer (Ramli, 2017).

In 2017, a study conducted on the "Economic impacts of Haze to Health in Malaysia", was able to inform the resources needed and economic burden in treating the common diseases such as headache, redness of eyes, flu and asthma consequent to the periodic haze situations in the country. This was not a cost-effectiveness analysis study since it was not about choosing the best intervention to overcome the health impact of haze, instead was to estimate the cost to treat the illnesses imposed by haze to human health. We found that the incidence of the symptoms and diseases from exposure to haze were significantly higher during haze compared to non-haze seasons. The findings from the study are potential for usage for the preparation of the healthcare system in facing future haze incidence (Jaafar, 2019).

Before 2019, it was unfortunate that Hepatitis C patients in Malaysia did not get the appropriate treatment for their conditions since the Drug Acting Antivirals (DAA) for Hepatitis C patients were not readily available and accessible to them. Serological surveillance was not nationwide and as such it was difficult to estimate the prevalence of Hepatitis C patients needed DAA. In collaboration with the MOH and several researchers from overseas, they were able to estimate and project Hepatitis C prevalence in Malaysia (Hassan and Chan, 2020) and performed a budget impact analysis for the government to subsidize DAA for proper management of Hepatitis C of affected Malaysian. The findings were able to justify on the investment for life-long treatment of the disease which can be exorbitant (Hiebert *et al.*, 2019).

Presently, with the Covid 19 pandemic affecting the country, an economic evaluation works in progress to determine the disease and economic burdens of Covid 19 in the country, especially on its implications to the healthcare system. The grant for this study was awarded by the Ministry of Science and Technology as a recognition on the various economic evaluations that the first author had performed. In addition, she is currently leading the Malaysia research team in CoMo or Covid 19 Modelling Consortium set up by the University of Oxford to model the infection under various health interventions and lockdowns imposed by more than 20 countries joining CoMo. The CoMo team had published on the potential health and economic impacts of dexamethasone treatment for patients with COVID-19 (Ku Abd Rahim *et al.*, 2020).

Conclusion

The country, especially the ministry of health could highly benefit the findings from economic evaluations on the health programs conducted by academicians and researchers. Findings from economic evaluation studies, coupled with feasibility

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p-ISSN 2303-3592, e-ISSN 2540-9301
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and cultural adaption assessment should be used and translated into policy for a sustainable implementation of health interventions. Collaborations between the various stakeholders and the program owners to provide evidence to assist in policy decision on which health interventions to be invested and implemented, should be enhanced. In Malaysia, the Health Technology Division of Ministry of Health (MAHTA) has developed the platform for this collaboration and as a team, some technical issues on economic evaluation studies have been discussed and obtained solutions. It is very encouraging when the findings from various locally conducted CEA studies are used by MAHTA to set the CEA threshold for accepted health interventions in the country (Águas *et al.*, 2021). By sharing these economic evaluation studies conducted in Malaysia, it is hope that researchers in the neighbouring countries such as Indonesia which has similar resources limitations are aspired conduct similar economic evaluation studies of health programs and advocate the use of the relevance findings for policy making in the country.

Abbreviations

HRP: Harm Reduction Program; WHO: World Health Organization; PCI: Percutaneous Coronary Intervention; UMMC: University Malaya Medical Center; CEA: Cost-Effectiveness Analysis; CUA: Cost-Utility Analysis; CBA: Cost-Benefit Analysis; TDTP: Transfusion-Dependent Thalassemia Patients; DAA: Drug Acting Antivirals: CBE: Clinical Breast Examination; CoMo: Covid 19 Modelling Consortium; MAHTA: Health Technology Division of Ministry of Health.

Declarations

Ethics Approval and Consent Participant

Not applicable

Conflict of Interest

We declare that we do not conflict with anyone's interest.

Availability of Data and Materials

Not Applicable

Authors' Contribution

MD had developed the manuscript. TNR, E and DC review the manuscript.

Acknowledgment

The author wishes to acknowledge her research team members in all the studies that were conducted either as a student's thesis or research project, and the co-authors of this research review

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Editorial

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.107-109

HOW CRUCIAL IS THE WORKING ENVIRONMENT IN SUPPORTING THE PERFORMANCE OF HEALTH WORKERS?

Seberapa Penting Lingkungan Kerja Dalam Mendukung Kinerja Pekerja Kesehatan?

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In the last semester of the second year of the COVID-19 pandemic, our journal emphasizes its current issue on the life of health workers as humans. We choose to underline the working environment condition as one of the super significant predictors of health workers' performance, leading to a stronger health system in the future.

We always believe that patient safety is the number one priority in healthcare. However, the article written by Nurdin and Wibowo (2021) explains that environmental factors are still barriers to patient safety. Their narrative review found that the low competencies of health workers in understanding patient safety, combined with a working environment that shares shaming and blaming culture, cause the weak reporting of patient safety incidents.

In the other article, our authors also exacerbate the fact that the working environment is not equipped with a solid relationship between health workers, especially with different professional backgrounds. Our author Wahyuni *et al.* (2021) reported that the working environment in the studied hospital is full of individualism that ruins the collaboration between the health profession. This paper suggests how the utilization of integrated working instruments of the team with different professions and supportive work design will help boost interprofessional communication as the basis of the collaboration itself. Taking pharmacists as the study object, Antari *et al.* (2021) also reported how the organizational culture significantly affected health workers' performance. A conducive organizational culture works within the health worker's motivation to perform their work as best as possible.

Variations of health conditions make the type of treatment varied between patients. *Inspanningsverbintenis*, health services performance is not valued based on its result but its process. Hence, procedures standardization is highly needed. Karnadipa (2021) reported that the absence of these standardized procedures among physiotherapists risked their low self-confidence in their professionalism. Another article written by Putra *et al.* (2021) also highlights that the adequacy of nurses in number and working equipment is related to missed nursing care. Both of these articles show us that a supportive working environment is not only about the ambience of the day-to-day surrounding working space, but working infrastructures that guide and protect the health workers are also still needed.

Regarding to our main editorial on the working environment, our editors have also chosen to publish articles that help the health management select the proper method to support their daily working process.

After a long time, we never received any work on inventory planning of the health industry. A paper written by Yudianti *et al.* (2021) reflects which inventory planning method is robust. The article claimed that the combination of EOQ and ROP methods in a hospital had increased efficiency in managing disposable medical materials. Dahlui *et al.*

Jurnal Administrasi Kesehatan Indonesia
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v9i2.2021.107-109

(2021) emphasized how important the economic evaluation studies were in helping the health system understand about the effectivity of health intervention.

However, in the second year of the COVID-19 pandemic, we still received many studies related to the urgency of policies regarding the pandemic. Wirawan *et al.* (2021) highlighted how this pandemic seemed to be a cycle of grief that weakens population performance in exercising preventive behaviour. The more population fell to a more profound economic crisis, the more population tends to neglect the COVID-19 control measures. These findings are supported by the study of Jayawickrama *et al.* (2021). They presented a narrative review on how derivation of mitigation policies was crucial to ensure that the health system was working effectively during the pandemic. The direction of policymakers in mitigation is a valid indicator to predict the health system's future. Hence, there is urgent work to read how mitigation policy in each country has worked well. When it is weak or unclear enough to ensure that policy supports pandemic mitigation, it must indicate whether it is an unstable health system or the contrary. This paper raises an essential issue in measuring that a health system is on its right track to achieve a more effective and responsive health system.

All in all, these current journal issues show us the importance of the working environment in the health system. As the motor of the health system, health workers need to be supported by a conducive working environment. Preparing the working infrastructure is as crucial as preparing the positive working condition. Thus, putting an excellent basis to make the working process more efficient is fruitful for the organization and the health workers themselves.

Abbreviations

COVID-19: Corona Virus Disease; EOQ: Economic Order Quantity; ROP: Re-Order Point.

Declarations

Ethics Approval and Consent Participant
Not applicable

Conflict of Interest
The author declares that there is no personal interests that might have affected the performance.

Availability of Data and Materials
Not applicable

Authors' Contribution
NKP wrote, reviewed, and edited the manuscript.

Acknowledgment
Not applicable

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Original Research

How the utilization of integrated working instruments of the team with different professions and supportive work design will help boost interprofessional communication.
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Original Research

The combination of EOQ and ROP methods in a hospital had increased efficiency in managing disposable medical materials.
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Literature Review

The important of economic evaluation studies to understand how effectiveness of health intervention.
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JAKI
JURNAL ADMINISTRASI KESEHATAN INDONESIA
INDONESIAN JOURNAL of HEALTH ADMINISTRATION

ISSN: 2303-3592
Volume 9 No 2 December 2021

Jurnal Administrasi Kesehatan Indonesia (JAKI) is published by Universitas Airlangga, Faculty of Public Health, Department of Health Administration and Policy collaborated with Indonesian Public Health Union *(Persakmi)*. We welcome all of experts, practitioners, and academicians who are interested in healthcare administration to submit their articles. Articles in this journal discuss various current issues in healthcare administration. The publication is issued twice a year (June and December). JAKI has been indexed by DOAJ, Google Scholar, SINTA 2, Garuda, BASE, EBSCO, Hinari, and *Indonesian Publication Index* (IPI).

JURNAL ADMINISTRASI KESEHATAN INDONESIA
INDONESIAN JOURNAL of HEALTH ADMINISTRATION

ISSN: 2303-3592
Volume 9 No 2 December 2021

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INDONESIAN JOURNAL of HEALTH ADMINISTRATION

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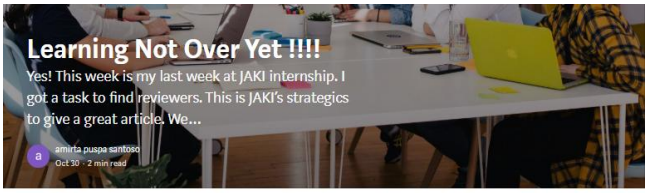

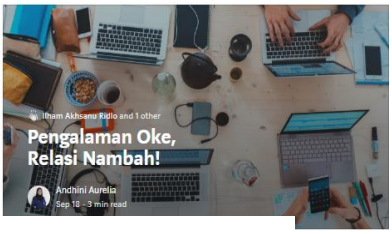

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Jurnal Administrasi Kesehatan Indonesia (JAKI) receives scientific works in the form of ORIGINAL ARTICLES, COMMENTARY, LITERATURE REVIEW, and SHORT COMMUNICATIONS. The manuscript must be original and unpublished. If the manuscript is accepted for publication in JAKI, then the submission manuscript shall not be permitted to publish to other media.

The manuscript is typed on A4 size A-size HVS paper with 1.15 spaced space on 1 side (not back and forth). Original and review articles are up to 4000 words (main text) with a structured abstract of up to 200 words and 30 references. Commentaries should be up to 1000 words with an unstructured abstract of up to 200 words and ten references. We also receive short communications, which should be up to 800 words long with only one table or figure, a structured abstract of up to 100 words, and five references. The font type used is Arial size 11 pt. Margin or border of writing from the edge of the paper 2.5 cm in all four sides. The script is typed in (2) two columns. You are not allowed to use footnote. The manuscript file is sent in MS Word format. The manuscript is written in English with effective and academic language. All incoming scientific articles will be judged by the editor-in-chief appointed by the editors.

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