

Qualitative Analysis: Issues and barriers of Medication Management in Residential Aged Care Facilities

Mariani Ahmad Nizaruddin¹, Nurul Dania Abdul Rahman¹,
Marhanis Salihah Omar², Adliah Mhd Ali², Mohd Makmor
Bakry²

¹Department of Community Pharmacy Practice, Faculty of Pharmacy, Cyberjaya University
College of Medical Sciences, 63000 Cyberjaya, Selangor, Malaysia.

²Faculty of Pharmacy, National University of Malaysia, Jalan Raja Muda Aziz, Kuala
Lumpur.

Abstract

Malaysia is one of the developing countries in the world that faces the issue of an increasing elderly population. Co-morbidity and multiple uses of medication commonly occur among elderly population. Prevalence of inappropriate medication management is high in the residential aged care facility settings. A qualitative study was conducted to identify relevant issues and barriers in achieving effective medication management in Malaysian nursing home. Document type of analyses was used in which documents in the form of analytical writing, journal keeping, policy report, or press release were gathered. from different databases, including Mendeley, Medline, Science Direct, Google and Google Scholar. The extracted data were analysed using thematic analysis to classify and find the pattern on those issues. The triangulation method emphasised within method and type of investigator was used to validate the data. Several themes including governance associated with medication management, regulatory, system influenced medication management, medication use process, theory of interdisciplinary collaboration, patient-related factor, staff-related factor and lack of research on medication management were identified in this study. The validated data is important to discover the barrier in achieving good medication management. Thus, the finding in this study highlighted the issue regarding medication management requiring standardised system and established guideline.

Keywords: *Qualitative analysis, nursing home,*

residential aged care facility, long-term care, medication management and medication mismanagement.

1. Introduction

Based on United Nations estimation, the world population of 60 years and above will be 1.2 billion by the year 2025, and the largest contributions are in the developing countries (Arokiasamy, 1997). In Malaysia, the continuing decline in mortality and fertility has resulted in the increase of aging population. Hence, that compounded with social changes has resulted in an expanding residential aged care facility and nursing home sector.

Nursing home is defined as a long-term, aged or skilled care facility which provides care for dependent older people (Spilsbury *et al.*, 2011). In Malaysia, these services are provided by the government, NGOs and the private sector.

Medication mismanagement is a growing public health concern, especially among elders. It has been reported approximately 3 million older adults were admitted into nursing homes and skilled nursing facilities because of medication mismanagement-related events and other drug-related problems annually (Johnson JA & Bootman JL, 1995). Medication management in nursing homes is complex and the elderly living in such settings have high risk of medication error which can affects their health

condition and lead to death. Although there are increasing numbers of nursing home in Malaysia, there are still lack of review studies of the causes of improper management on medicine for the residents in the nursing home

2. Methodology

A qualitative analysis was used as a study design. A preliminary discussion between investigator is done first to seek the issues and barriers arise that affect the medication management in the nursing home specifically in Malaysia.

This research study utilised purposive sampling as a method of sampling and criterion-i as a type of purposive sampling. Criterion-i was used as the strategy emphasise on similarity. It focused on similarities on several data collection and compared with the current practice applied in residential aged care in Malaysia and globally. Purposive sampling was used because the data will be purposely selected to explore the issues and literature will be reviewed regarding medication management imposed in a residential aged care facility.

A document type of analysis was used in this study where it comprised of journals, review articles, various public records and furnished documentary materials that related to residential aged care facility or elderly. The various types of articles were identified through non-electronic and electronic databases such as Google Scholar, Science Direct, Mendeley and Medline by using several keywords. The procedure for executing the steps of the plan to collect and record the data by using 'Document Summary Sheet' and 'Data Collection Form'. The criteria to retrieve the data including Malay and English publication, articles of reference list, database, hand searching and grey literature.

2.1 Data analysis

All documents collected were analysed by using thematic analysis. This analysis was used to analyse the classifications and present themes (patterns) that relate to the data. It enhanced the accuracy of the study which improved the whole meaning of the research. Six phases of thematic analysis were used for this study. The first step was familiarisation of the

data. The second phase involved the generating of the initial codes using manually.

The third phase was searching for themes. This phase re-focused on analysis on the wider level of themes rather than codes. The fourth phase was reviewing the themes.

The fifth phase was to define and name the themes. Finally, was a report writing. The data of the published research studied that assess the barrier in residential care will be identified, synthesised, and critically evaluated. The improvement interventions must be tailored to identify the barriers. As it highlighted the gaps in the available research on barriers, therefore advanced development on effective strategies to improve quality in medication management and resident health in nursing home setting can be achieved.

2.2 Data Validation

Triangulation method was used to validate the data in this study where the process of verification to increase validity by incorporating several viewpoints and methods of the issues. In this research, methodological type of triangulation by emphasising within method and investigator type of triangulation was used to validate the data. The use of within method type triangulation is essential in 'cross-checking' the data to prove the internal consistency and reliability. The investigator type was important as it involved two or more skills of researcher to examine the problems.

3. Results

A total of 31 out of 40 documents from different sources had been analysed in this study. Out of 31 documents that had been reviewed, 40 codes and 15 categories were identified. The codes and categories were classified under eight main themes as tabulated in Table 3.1. The themes were discussed based on the barriers and practices commonly occurred in nursing home setting. Both barriers and practices were related among each other and may happen concurrently in this study. The outcome of the study was important to compare the main issue that hindered the effective medication management in Malaysian nursing home.

Table 3.1: The result of eight different themes with the codes and categories

CODES / CATEGORIES	THEMES
<p>Lack of established guidelines and policies</p> <ul style="list-style-type: none"> a. Lack of implementation standard of care to conduct medication review and provide education to nursing home staff on medication management. b. No specific legislation on medication management for elderly in nursing home. c. Lack of evidence-based guideline in policies markers. <p>Standard guiding principle in medication management</p> <ul style="list-style-type: none"> a. Emphasise on quality use of medicine to minimise error in handling medication. b. To review policies, standards and advice on legislation. <p>Accreditation standard for nursing home facility</p> <ul style="list-style-type: none"> a. Advocate registration on licensing of care centre according to appropriate legislation. b. No basic minimum standard applicable for the staff in nursing home setting. <p>Standard of pharmacist providing service</p> <ul style="list-style-type: none"> a. Standard specialisation for pharmacist involvement in developed country to ensure efficacy and safety used of medicine by residents in nursing home setting. 	<p>Governance Associated with Medication Management</p>
<p>Mechanism for medication coverage</p> <ul style="list-style-type: none"> a. Introduce Medicaid’s payment for nursing home care opened the door to nationalised regulation that comes with the power of the purse. b. Introduce Centres for Medicare and Medicaid Services (CMS) to oversee long-term care reimbursement, regulation, and the operation of the Quality Improvement Organisations. <p>Enforcement of licensing to operate facilities</p> <ul style="list-style-type: none"> c. Regulatory action for approval of license to operate healthcare services and facilities. d. Regular inspection for maintaining licensing to operate nursing home facility. e. Monitor staffing procedure. 	<p>Regulatory</p>
<p>Medication chart system</p> <ul style="list-style-type: none"> a. Introducing electronic medication chart that improve in identifying residents’ medication, monitor the safety and consistency used of medicine. <p>Healthcare system barrier</p> <ul style="list-style-type: none"> a. Complex system approach cause difficulty to access policies. b. Lack of integrated healthcare system. c. Lack of access clinical data and pharmacy service. 	<p>System Influenced Medication Management</p>

Table 3.1: The result of eight different themes with the codes and categories (continued)

CODES / CATEGORIES	THEMES
<p>Deprescribing</p> <p>a. Discontinuation of selected drug to reduce polypharmacy in elderly at nursing home.</p> <p>Administration</p> <p>a. Dose administration error often occur due to several factors such as incompetent staff handling medication.</p> <p>Monitoring</p> <p>a. Lack of time by the staff to double check medication.</p>	<p>Medication Use Process</p>
<p>Pharmacy led reconciliation</p> <p>a. Involvement of pharmacist in performing process detecting discrepancies and preventing related adverse event.</p> <p>b. Recognise inappropriate use of drug.</p> <p>c. Conduct medication review.</p> <p>d. Enhanced role in supporting medication management.</p> <p>Absence of physician at times resident transition to identify discrepancy on medication</p> <p>a. Physicians are not available during critical state of providing medication to resident.</p> <p>b. Physician rely on nurses to manage medication.</p> <p>c. Effective communication did not occur between physician and other healthcare staff.</p> <p>Nurses ‘sense-making’ to identify discrepancy</p>	<p>Theory of Interdisciplinary Collaboration</p>
<p>a. Perception to well or unwell towards medication.</p> <p>b. Condition states of elderly that relatively have multiple disease states.</p> <p>c. Health literacy.</p> <p>d. Environmental barriers to adherence such as belief in alternative medicine and avoid taking conventional medicine in chronic illness.</p>	<p>Patient-related Factor</p>
<p>Staff including nurses, carers and health care providers:</p> <p>a. Less education, experience and medication training.</p> <p>b. Failure to adhere to policy, procedure documents and number of working hours.</p> <p>c. Perception of error reporting by nurses.</p> <p>d. Fear of chastisement and the perception of error reporting prevent nursing home staff from openly discuss residents’ safety.</p> <p>e. Lack of understanding and knowledge towards medication.</p> <p>f. Nurses fail to adhere documented procedure (practices).</p> <p>g. Misidentification of cases by staff and nurses.</p> <p>h. Relationship between caregiver and resident.</p>	<p>Staff-related Factor</p>
<p>a. Less study on medication management in nursing home facility.</p>	<p>Lack of Research in Nursing Home Setting</p>

There were eight main themes identified in this study. The eight main themes were governance associated with medication management, regulatory, system-influenced medication management, medication use process, theory of interdisciplinary collaboration, patient-related factor, staff-related factor and lack of research on medication management in nursing home setting. Overview framework of the result for examining practices and barriers in achieving good medication management in nursing home were mapped into figure 3.0. These 8 main themes

were further elaborated in the discussion.

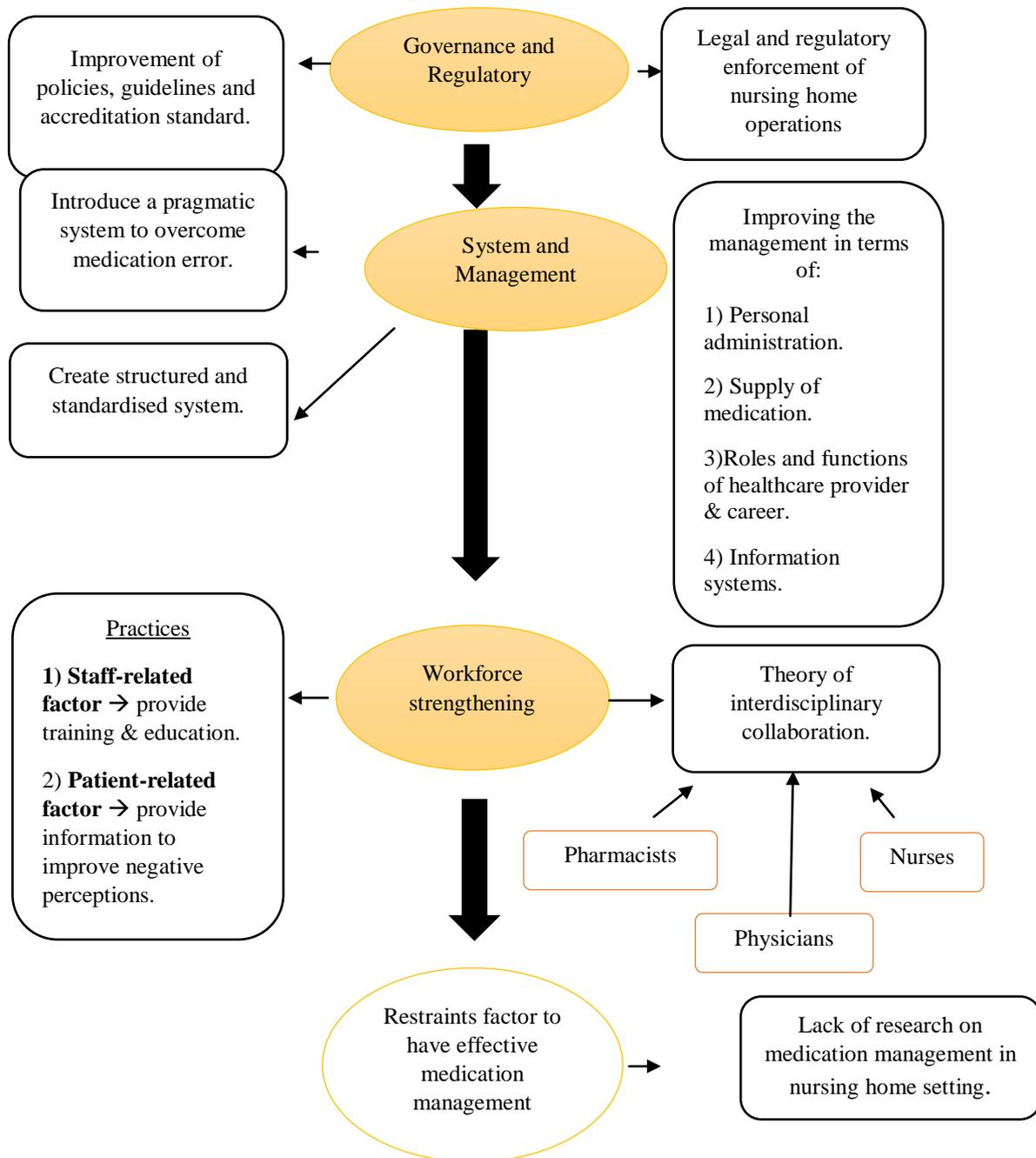


Figure 3.0: Overview framework of the result for examining the practices and barriers in achieving good medication management in nursing home facilities.

4. Discussion

4.1 Governance Associated with Medication Management

4.1.1 Lack of Established Guideline

Based on a report by Department of Economic and Social Affairs (2015), approximately 8% or 587 million are elderly more than 65 years in worldwide population and most of them are in Asia. There were 20-70% rate of potential medication-related issues in terms of inappropriate medication prescribed in nursing home around South East Asia region (Aqqad *et al.*, 2014). Most of healthcare provider will face challenges to withhold or discontinue the medications in the nursing home. This happens due to lack of established guidelines and data for medication to be prescribed in elderly with multiple co-morbidities. Every medication should be cross-referenced with medication chart or pharmacy medication record to prevent any misprescribing throughout the process.

In Malaysia, standard of care and guideline in conducting medication review by the authorised person such as pharmacist has not been implemented. As comparison with Singapore, a pharmacist has the role to conduct all medications review and educates the staff regarding medication management. Provision of this patient care service in nursing home is already stipulated in the federal regulation of this country.

4.1.2 Standard Guiding Principle in Medication Management

Guiding Principles for Medication Management in Residential Aged Care Facilities (2012) was introduced to achieve positive health outcome and better economic services related to medication management. This guideline is developed under Australia's National Medicines Policy and the core objective is the quality use of medicine (QUM). It emphasises the various aspect of medication management to ensure the proper prescribing and appropriate use of medicine.

Besides that, another specific organisation known as Medication Advisory Committee (MAC) is also implemented in Australia. The roles are to review the policies and procedures, review medication incidents and adverse drug events report, advises on legislation and standards, analyse educational needs of staff and residents, and contribute the interventions to optimise medication use.

In Malaysia, there is no specific organisation to

recognise the inappropriate practice of medication management. Misconduct of practice can only be detected after residents' conditions become worst and diagnosed by the physician. Based on Malaysian National Medicines Policy by Ministry of Health Malaysia (2012), DUNAS has established the principle of quality use of medicine (QUM). The aim is to ensure medications are used judiciously, appropriately, safely and cost-effectively to promote better health outcome. Although the strategy is almost the same for both countries, the implementation of this policy in Malaysia is still poor which only focusing on hospital setting rather than nursing home setting.

4.1.3 Accreditation Standard for Nursing Home Facility

Australian Aged Care Quality Agency is one of the national independent accreditation. The function is to regularly audit the facilities to ensure they meet the accreditation standard. Four standards introduced are medication management, managing the facilities safely and correctly, compliance with medication management with relevant legislation or professional standards, and staff following the principles. Besides that, the quality agency conducts re-accreditation audit by time, review of policies and procedure on MAC meeting minutes and assess on self- medication and drug utilisation evaluation.

Besides that, the quality agency conducts re-accreditation audit by time, review of policies and procedure on MAC meeting minutes and assess on self- medication and drug utilisation evaluation. This approach results in the significant improve outcome in managing medication for the resident. Therefore, all those standards should be reviewed and implemented into Malaysian Standard Guideline for nursing home setting in future.

In comparing Aged Care Policy or Guideline in Australia with Asian countries, policy standard in Asia aims in maintaining cultural norm or value rather than looking into the improvement on health program and services.

4.1.4 Standards for Pharmacist Providing Service

In Canada, there is standard specialisation for pharmacist involvement in long-term care called Standard for Pharmacist Providing Services to Licensed Long Term Care Facilities introduced by Ontario College of Pharmacist. The aim is to recognise the level of pharmacy service in improving quality of life in long-term care residents and ensuring the safety and effectiveness use of

medicine. This standard is practical to be adopted together with the Code of Conduct for Pharmacist Malaysia and Body Corporate by Pharmacy Board of Malaysia (2009) as to provide the more specific guideline for the pharmacist in long-term facility around Malaysia.

This standard allows pharmacist to encourage resident to know the importance of pharmaceutical care. The standard for Pharmacist Providing Services to Licensed Long Term Care Facilities is tabulated in the Table 4.1.4.

Table 4.1.4: Pharmacist providing services to licensed long -term care facilities

STANDARD 1: CLINICAL SERVICE

- | | |
|-----|---|
| 1.1 | The pharmacist communicates using effective and relevant skills to nursing home facility staff members, residents or agent of the residents. |
| 1.2 | The pharmacist utilises various documentation tools as evidence such communication. |
| 1.3 | The pharmacist participates in clinical activities relevant to the provision of drug therapy to optimise patient care. Activities not limited to comprehensive medication review and drug utilisation reviews. |
| 1.4 | The pharmacist participates in educating of the interdisciplinary team, residents on drug therapy and appropriate medication use. |
| 1.5 | Continuous Quality of Management <ul style="list-style-type: none"> 1.5.1 The pharmacist encourages safe medication practices and participates in the development, implementation and evaluation of all the practices. 1.5.2 The pharmacist participates in reviewing medication-related event and provides intervention to prevent recurrence. |

Source: Matthew Wong, Research Intern MOHLTC Dorothy Tscheng, 2009.

4.2 Regulatory

There are various regulatory approaches worldwide. The regulatory influences the actions, behaviours, and decision of others. The function is to improve quality in the specific area, develop accreditation

standard and best practice to achieve quality in the system especially on healthcare. The different kind of regulatory are concerned in area of safety, facility, and health. One of regulatory approach emphasise the quality improvement of health is known as mechanism for medication coverage.

4.2.1 Mechanism for Medication Coverage

The regulatory environment by introducing Medicaid and Medicare significantly affect the long-term care system in the form of facility and health program. Both program and policy have been implemented in the United States where Medicaid is operated by both federal and state while Medicare only by federal state (Ng *et al.*, 2010). The benefit from this program is it covers the care regarding the health of the residents. It helps with medical costs for some people with limited income or resources, especially in elderly and disabled person.

In Malaysia, most people need to purchase private insurance coverage to have better health services. Under Medicare International Malaysia Insurance (2017), it only serves to seek and provide an option or the information to purchase medical insurance coverage to the one that needs quality healthcare service. However, a new budget known as Voluntary Health Insurance Scheme will be introduced in the middle year 2018 as a part of alternative healthcare services to people and will be operated by the non-profit organisation under ministry purview (The Malay Online, 2017). The main purpose of this Voluntary Health Insurance is to ensure high quality care for the public in all range includes an elderly.

4.2.2 Enforcement of Licensing to Operate Facilities

According to Health and Personal Social Services (2005), to achieve standard of care, the nursing home must follow the regulation in Nursing Homes Regulations Northern Ireland. Under this regulation, the specific authority may able to conduct inspection to ensure the quality of service provision.

However, in Malaysia, the enforcement that need to oversee the facility, health and welfare of elderly in this residential aged care facilities are still weak. There is no restriction to whom operates this nursing home facilities such as registered healthcare practitioner. They do not emphasise the safety on their services and procedures on medication given. Thus, it results in ineffective medication management and poor of quality services in nursing home setting around Malaysia.

4.3 System Influenced the Medication Management.

4.3.1 Medication Chart System

The design of the system in other country is more advanced as compared to Malaysia. The safety of the medication used is one of the priority to establish the nursing home. The National Residential Medication Chart including electronic-based is proposed in Australia. It benefits in recognising the safety and consistency use of medicine by health care provider and nursing home staff including nurses. Medication charts provide details of each residents' medication and enable nurses to monitor frequently.

In Malaysia, most of nursing home especially in private and non-government sector (NGO) rarely apply this type of medication chart. They are mostly do not provide any specific record of individual medication. Due to unstructured documentation procedure, the medications are always mixed up with other residents. Therefore, the track record for an individualised resident is hard to obtain due to unsystematic procedure used in this nursing home facility

4.3.2 Healthcare System Barrier

The healthcare system is referred to an organisation or institution design to provide medical service to people. In Malaysia, the primary healthcare system can be categorised into public and private sector (Thomas *et al.*, 2011). The healthcare system in Malaysia primarily focuses in care of acute and episodic illness. The orientation of the system developed passively where the seeking for the treatment only occur when symptoms of the illness in elderly progressively worst. This complex healthcare system will create barrier for improving the quality of healthcare services in nursing home although it can be managed by having trained specialist in geriatric to support their needs.

4.4 Medication Use Process

Medication use process consists of the steps from prescribing, dispensing, administering, monitoring and educating. However, there are various steps used by different institutions in different countries. For an example, the existence of deprescribing process in Australia, New Zealand, United States, Canada, and several European countries give benefits in reducing polypharmacy

4.4.1 Deprescribing

The deprescribing process can overcome the issues of polypharmacy. It was commonly used by European country but lack of practice in Asian region especially in the nursing home. Deprescribing is a type of discontinuation of specific medication that is not appropriate to be used. Unlike nursing home in Malaysia, the medications were repetitively administered to the patient even though the medication should only be used PRN or as needed.

4.4.2 Administration

Administration of medication is one of the core components in process of medication management. It occurs between two persons where one is giving and the other one is receiving the medication. In long-term care, the staff and nurses are commonly administering the medications. A lot of potential errors may happen in the administration process. Inappropriate dose or the wrong type of dosage form given to elderly and high risks group influence the safety. Due to misconduct of medicine by the staff, it contributes to an error that may lead to death.

4.4.3 Monitoring

Monitoring of medication is crucial in the residential aged facility. Without monitoring, the compliance issue and misuse of medication may persist along the process. The barrier of monitoring arises when there is lack of nursing staff to double check medication before administering to the residents especially in NGOs residential home. The existing staff needs to work extra hours to complete the tasks and managing the residents. This extra workload causes a burden to the staff which can lead to the medication error.

4.5 Theory of Interdisciplinary Collaboration

Medication used in the nursing home is often suboptimal. The frailest elderly in the nursing home need extra care when it comes to medication management. pharmacodynamic and pharmacokinetic changes in advanced age lead to the various risk of interactions. Therefore, the interdisciplinary collaboration that consists of pharmacist, physician, and nurse seem to improve the workflow efficiency in managing medication.

4.5.1 Pharmacist-led Reconciliation

Pharmacist-led reconciliation is established in the United States of America. The clinical pharmacist has an important role in identifying drug-related

problems. Clinical pharmacist becomes mandatory to monthly review the residents' medication.

The reviewing of medication conducted by pharmacists are used abroad but not in Malaysia. Pharmacist proves the quality in identifying discrepancies. Besides, Act 586 Private Health Care Facilities and Services Act (1998) is also highlights the requirement to have different collaborative of professional especially pharmacist in private long-term care facilities.

4.5.2 Absence of Physician at Times Resident Transition to Identify Discrepancy on Medication

Most the physician rely on nurses or staff in scheduling residents' medication and not often available at the time of medication administration. There had been the situation where some physicians in charge did not really know the specific medication owned by the residents. They always expect the nurses to be the hub of the communication and gather all the information.

4.5.3 Nurses' 'Sense-Making' to Identify Discrepancies

'Sense-making' means the ability by the staff to make sense of ambiguous situations. This is important to identify discrepancies in medication administration. Nurses sense-making highly influences residents either to promote or to hinder medication safety. In a European country, the nurses must be qualified as a standard requirement before working in a nursing home setting. In contrast, Malaysian nursing home in private and NGOs setting are rarely being qualified. The stakeholder prefers to hire incompetent staff without preparing them basic training on medication management.

4.6 Resident-related Factor

Patient health belief and attitude towards the regimen either may improve or worsen the condition is one of the examples of resident-related factor. Residents' experience of the symptom or adverse effect from the existing pharmacological therapies may influence the acceptance towards the treatment. Furthermore, perception toward fatalism is commonly encountered by elderly in nursing home.

4.7 Staff-related Factor

Nurses play an important role to ensure the safety

steps involved in medication process. The major mistake happened when the nurses fail to adhere documented procedure provided in the guideline. Some of the nurses have limited knowledge on medication and low critical thinking in making the decision.

There is also another issue related to the inadequacy of health literacy. Health literacy is the ability of an individual to obtain, process information to make the right decision and follow the instructions. It involves the demand for resources and the skills that people bring to it. This suboptimal health literacy leads to non-adherence to medications.

Staffing problems are among prominent barrier to have a quality outcome in medication process of the nursing home. The shortage of licensed nursing home nurse is common in this long-term care facility. The lack of staff member issue contributes to the need to work extra hours for the nurses and carers to perform their job. Limitation of the time makes it difficult for them to achieve the quality of completing the job.

4.8 Lack of Research on Nursing Home Setting

Ironically, residential aged care facilities or nursing homes are among the highest consumer of medications but there is the least study on that. Only 2% estimated number of study regarding elderly in nursing home (Y. Rolland *et al.*, 2009). The evidence is important to identify the risk and effectiveness of pharmacotherapy since it is not consistent in elderly. Aged-related factor alters the pharmacodynamic and pharmacokinetic of the medications which changing the goals of care in treatment for elderly in this setting. The way to improve the quality of medication management in the residential aged care facility (RACF) is by having more research in this area.

5. Conclusion

In conclusion, the governance structure influences the practices which act as a standard of guideline for the stakeholder to manage medication appropriately. A suitable guideline from another country should be reviewed, adapted and implemented to overcome the lack of practice in handling medication. Besides that, it is a need of the standardised system in government, non-government organisation and private nursing home setting. More practical based system is vital to achieve quality use of medicine in this setting.

Next, medication used process should be done prudently to ensure the safety and efficacy of medicine used by residents. Interdisciplinary collaboration that consists of expertise in this specialised area helped in optimising best health care services in the nursing home setting. The value of expertise helps in promoting inter-professional education in aged care facility and preventing medication-related error, especially during administration. Both patient and staff-related factors are another challenge in achieving good practices in medication management. Therefore, the improvement should be done by having more research in this area.

References

- [1] Arokiasamy, J.T. (1997). Malaysia's Ageing Issues (Editorial). *Medical Journal of Malaysia* **52**:197-201.
- [2] Aqqad SMHA, Chen LL, Shafie AA, Hassali MA, Tangiisuran B. (2014). The use of potentially inappropriate medications and changes in quality of life among older nursing home residents. *Clin Interv Aging*, **9**: 201–7.
- [3] Act 586 Private Healthcare Facilities and Services Act. (1998). Laws of Malaysia Act 586 Private Healthcare Facilities and Services Act 1998. *Director*, (May). Retrieved from [http://www.mma.org.my/Portals/0/private healthcare facilities and services act 1998.pdf](http://www.mma.org.my/Portals/0/private%20healthcare%20facilities%20and%20services%20act%201998.pdf).
- [4] Department of Economic and Social Affairs PD, United Nations. World population prospects: revision. (2015). Available at: [http://esa.un.org/unpd/wup/Publications/Files/WUP2014- Report.pdf](http://esa.un.org/unpd/wup/Publications/Files/WUP2014-Report.pdf)> (last accessed on 7th August 2017).
- [5] Guiding Principles for Medication Management in Residential Aged Care Facilities. (2012). Retrieved from <https://www.health.gov.au/>.
- [6] Health and Personal Social Services. (2005). The Nursing Homes Regulations (Northern Ireland) (160).
- [7] Johnson JA, Bootman JL. (1995). Drug-related morbidity and mortality: A cost of illness model, *Arch Int Med*, 1995, vol. 155 (pg. 1949-56).
- [8] Matthew Wong and Dorothy Tscheng, Bs. (2009). Issues in Medication Management Relevant to Long-Term Care in Ontario: A Brief Review of the Literature, 1–32.
- [9] Medicare International Malaysia Insurance. (2017). Malaysia Health Insurance (online) <https://www.malaysiahealthinsurance.com/insurers/Medicare/> (last access 15th October 2017).
- [10] Ministry of Health Malaysia. (2012). Ministry of Health Malaysia Malaysian National Medicines Policy. Retrieved from www.imu.edu.my.
- [11] Ng, T., Harrington, C., & Kitchener, M. (2010). Medicare and Medicaid in long-term care. *Health Affairs*, **29**(1), 22–28.
- [12] Pharmacy Board Malaysia. (2009). Code of Conduct for Pharmacist and Bodies Corporate. Retrieved from <http://apps.who.int/medicinedocs/en/m/abstract/Js17802en/>
- [13] The Malay Mail Online. (2017). Voluntary health insurance scheme will be introduced next year.(online).<http://www.themalaymailonline.com/malaysia/article/voluntary-health-insurance-scheme-will-be-introduced-next-year#B83T4Gj8071FFjwh.97>(last accessed 31st October 2017).
- [14] Thomas, S., Beh, L., & Nordin, R. Bin. (2011). Health care delivery in Malaysia: Changes, challenges and champions. *Journal of Public Health in Africa*, **2**(2): 93–97.
- [15] Spilsbury, K., Hewitt, C., Stirk, L. & Bowman, C. (2011) The relationship between the nurse staffing and quality of care in nursing: a system review. *International Journal of Nursing Studies*, **48**(6): 732-750.
- [16] Y. Rolland, G. Abellan van Kan, S. Hermabessiere, S. Gerard, S. Guyonnet-Gillette, B. Vellas. (2009). Descriptive study of nursing home residents from the REHPA network, *J. Nutri Health Aging* **13**(8) (20): 679 683.