Document Analysis of Issues Concerning Medication Management Among Senior Citizens in Community Dwelling

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Abstract: Population ageing is a worldwide phenomenon experienced by developed and developing countries including Malaysia. Higher rates of chronic diseases and the increasing availability of therapeutic agents has resulted in an increase in drug use among the elderly. Inappropriate medication management is higher among senior citizens of community dwelling as they live in an uncontrolled environment compared to those in hospitals or nursing homes. This study was designed to identify the relevant barriers in achieving effective medication management among older Malaysians of community dwelling. A document type of analysis is used where the documents in the form of analytical writing, journal keeping, policy report, or press release are used as a part of this study. Various documents have been selected from different databases, including Mendeley, Science Direct, Google and Google Scholar. The data extracted was analysed and synthesised to seek the pattern regarding the issues. Several themes emerged including patient factors associated with medication adherence, medication factors, healthcare provider factors, multidisciplinary approach, healthcare system factors, psychological or support system, socioeconomic factors, system influenced medication adherence and medication management models for polymedicated home dwelling were identified in this study. The data highlighted barriers in achieving good medication management among older persons managing their own medications at home.

Keywords: Medication management, older persons, community dwelling, medication management, compliance, adherence, adverse drug event.

1. Introduction

Ageing can be defined as a biological, sociological, economical and chronological phenomenon. In line with the United Nations' and Ministry of Health's recommendation, "the elderly or ageing population" in Malaysia will be taken to mean people aged 60 years or old [1]. In Malaysia, it is estimated that by 2020 this group will contribute to 10% of the population of Malaysians or 3.4 million which by then Malaysia will be categorized as an aged nation according to United Nation projections [2]. In the United States, older persons are the leading consumers of medications, accounting for 34% of pharmacy expenditures. This is most likely due to the increasing level of chronic disease conditions with age, such that 85% of individuals in this age group have at least one chronic illness and one third have three or more medications [3]. Community-dwelling elderly, who lives outside of an institutional setting tend to have challenges with medication adherence. Estimates show that more than one out of every three persons among this population does not take their medications as prescribed [4]. Thus, this study aims to identify the relevant barriers in achieving effective medication management among older Malaysians of community dwelling.

2. Materials and Methods
**Sampling method** This research study utilised purposive sampling as a method of sampling and criterion-i as a type of purposive sampling. Purposive sampling technique was used for identification and selection information-rich data for the most effective and limited sources. The logic and power of purposeful sampling based on selecting information-rich study is that the study goes in depth for certain cases, highlighting the most important issues [5]. Criterion–i was used as the strategy’s emphasis is on similarity. It focused on similarities on several data collection and compared with the current practice applied globally and within Malaysia. Purposive sampling was used because the data will be purposely selected to explore the issues and literature will be reviewed regarding medication management imposed among community dwelling senior citizens.

**Study method** The study method used was document analysis. A systematic procedure was required to review and evaluate the document. The document for this systematic evaluation comprises of journals, policy, review articles, various public records and furnish documentary materials that related on medication management among community dwelling elderly included in this study. Forty five documents searched were both in printed form and electronic source and 25 out of them had been selected to undergo data extraction. It need to be read through the entire information as to perform constant comparative analysis.

**Data collection** The documents were searched using electronic data bases like Google, Google Scholar, Mendeley using specific keywords; medication management , older persons, community dwelling, compliance, adherence and adverse drug events where these term were combined using ‘OR’ and ‘AND’ Boolean operators that produced a final list of citation. Policy or procedure manual, press statement, journal, reviewed article, grey literature that was not published yet or appear during search engines such as unpublished studies, presentation or any relevant study were used.

**Data analysis** All documents collected were analysed by using thematic analysis. analyse the classifications and present themes (patterns) that relate to the data [6]. There were six phases of thematic analysis used for this study. The first step was familiarisation of the data. It involved ‘repeated reading’ of the data by the active way and seeking a meaning, patterns. The second phase involved the generating of the initial codes. The strategy involved was coded as many as possible for the potential themes and manual type of coding was used for identifying particular features of data set. The third phase was searching for themes. A potential theme was made by sorting the different code and collecting all pertinent code of data extracts within the identified themes. The fourth phase was reviewing the themes which involved deeper review identified theme whether to combine, refine, split or discard the initial theme. The fifth phase was to define and name the themes and the final step was report writing where the data analysis needs to be transformed into an interpretable way of writing by using vivid and compelling extract based on research question. The data of the published research studied that assess the issues occurred among community dwelling older persons were 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 can be achieved.

**Data Validation** Triangulation method was used to validate the data in this study. It was the process of verification that increase the validity by incorporating several viewpoints and methods of the issues [7]. Methodological type of triangulation by emphasising within a 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. It is also as an alternative to check researcher’s bias and to provide internal validity in the study [8].
3. Results

A total of 25 out of 45 documents from different sources had been analysed in this study. The types of document include original research papers, review articles, articles in the press, and any appropriate policy papers. The selected documents for this study were published in Malaysia, Singapore, Thailand, Canada, United States, United Kingdom, New York, Turkey, Netherlands, Ireland, Pennsylvania, Belgium, and Australia. The details regarding the specific issues of each article was recorded into data collection sheet and transferred into data collection form, spreadsheets. The codes and categories were classified under nine main themes as tabulated in Table 3.1. The themes were discussed based on the barriers and practices commonly occurred in community dwelling elderly setting. Both barriers and practices were related among each other and may happen concurrently in this study. Thus, the outcome from this study was important to compare the main issue that hindered the effective medication management among Malaysian senior citizens.

<table>
<thead>
<tr>
<th>CODES / CATEGORIES</th>
<th>THEMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health status and functional ability</td>
<td>• Physiological function changes resulting in the changes in the drug metabolism</td>
</tr>
<tr>
<td></td>
<td>• Physical difficulties in taking medication (swallowing) and inability to hold the medication (dropped).</td>
</tr>
<tr>
<td></td>
<td>• Changes in cognitive function can affect person’s ability to self-manage the medication.</td>
</tr>
<tr>
<td></td>
<td>• Practical problems with medication (distinction between different drug package, tablet swallowing and splitting, blister opening)</td>
</tr>
<tr>
<td>Patient consent to the treatment and motivation for taking the medication</td>
<td>• Patients’ beliefs and attitudes; have strong beliefs in the necessity of medicine, while beliefs in concerns, overuse and harm were less strong. However these strong beliefs could blind the older persons for adverse drug event.</td>
</tr>
<tr>
<td></td>
<td>• Older persons have negative belief; like medicines being expensive and confusing, about the long-term effects and dependency, interaction.</td>
</tr>
<tr>
<td>Lack of knowledge and skills needed to independently manage their own medication.</td>
<td>• Cognition and self-management ability were related to medication management capacity.</td>
</tr>
<tr>
<td></td>
<td><strong>Patient factors associated with medication adherence</strong></td>
</tr>
</tbody>
</table>
### Product-related problem
- a. Formulation
- b. Packaging
- c. Drug storage issues

### Drug handling
- a. Lack use of medication boxes
- b. Necessity to cut tablet
- c. Difficulty opening container

### Drug regimen
- a. Polypharmacy
- b. Medication regimen changes
- c. Complex drug regimen

### Adverse Drug Reaction (ADR)

### Incorporating indication into medication ordering

### Poor communication

### Lack patient involvement

### Lack of review of medications

### Medication reconciliation
- a. Involvement of pharmacist in performing process detecting discrepancies and preventing related adverse event.
- b. Recognise inappropriate use of drug.
- c. Conduct medication review.
- d. Enhanced role in supporting medication management.

### Lack of patient education

### Lack of follow-up

### Isolation or lack of social support
- a. Loneliness and family support

### Cost
- Transportation
- Financial and economy status

### Healthcare provider factors

### Healthcare system factors

### Medication factors

### Multi-disciplinary approach or Integration of care

### Psychological system/support

### Socioeconomic factors
Technology enabled-medication adherence

a. Introducing sensorised medication boxes that improve in identifying senior citizens medication adherence, monitor the safety and consistency used of medicine.

System Influenced Medication Adherence

Use of personal systems to reduce barriers to medication adherence

<table>
<thead>
<tr>
<th>Organised intervention</th>
<th>Medication management models</th>
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<tr>
<td>Patient reminder system</td>
<td>for polymedicated home dwelling</td>
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Table 3.1: The result of nine different themes with the codes and categories

4. Discussion

4.1 Patient factors associated with medication adherence

**Health status and functional ability** The Malaysian study revealed that 67% of the elderly had eyesight problems, 37% needed dental prosthesis while 13% had hearing problems. As the population continues to age, the emergence of a more elderly society with chronic disease and disability is likely. The ability to retain relatively well-functioning eye-sight, hearing, ability to chew and mobility has profound impact on the quality of life and independence of the elderly [9]. Mild Cognitive Impairment (MCI) is a condition that can affect older persons’ memory and thinking abilities. Prevalence of MCI in the community setting could range between 3% and 19%; and 10% to 20% of older people with MCI will progress to dementia, particularly the Alzheimer’s type [10]. According to Maddigan et al., the capacity to manage one’s own medication can be defined as the cognitive and functional ability to self-administer a medication regimen as prescribed [11].

**Changes in body function in elderly** In older people body functions change, and almost all body systems alter in structure and/or function with increasing age. In a healthy elderly person, this change might not be an overt problem, but it may nevertheless be more difficult or take more time for an elderly person to recover from illness. It is also more likely for the elderly to be left with a permanent disability after illness. Changes in body function can influence the metabolism and/or excretion of medicines. Prescribers must be aware of the risk of altered body functions as it may cause unexpectedly higher or lower drug levels. This can result in preventable adverse drug reactions, or, conversely, in reduced therapeutic effectiveness.

**Product related problem** Patient with Parkinson Disease (PD), they have difficulties with opening (blister) packages and difficulties with swallowing medications due to their disease-associated dysphagia and because as age increases the capability of swallowing decreases [12]. As an alternative, medication-container modification is recommended for older adults who have difficulty opening or reading containers. Use of non-childproof containers is one option for older adults. In addition, blister packs or other variations of unit dose packaging have resulted in increased compliance. Also, different tablet formulations that increase the ease of breaking tablets have been found to increase patients’ abilities to comply with their medication regimen. Finally, taking medication containers and large-print labels are modifications that can be useful for persons with visual impairment [13].

**Elderly’s beliefs about medicines** The elderly had strong belief in the necessity of their medicines, while beliefs in concerns, overuse and harm were less strong. However, some of the patients
indicated sometimes to worry of the long term effects of medication. In addition, they also have negative beliefs like all medicines are poison, expensive and confusing which indirectly affect the medication adherence. Furthermore, the older persons complaint of too many medications have being prescribed by the doctors to them and in their opinion if doctors had more time with patients they would prescribe fewer medicines [11].

**Lack of knowledge and skills needed to independently manage their own medications**

Patients’ understanding of the indications for their prescribed drugs (i.e. ‘medication knowledge’) have been classified by the research assistant as ‘correct’, ‘incorrect’ or ‘unknown’. An indication is classified as ‘correct’ if the patient can recall the purpose of the drug correctly or can classified the medications based on the organ or body system. Factors negatively associated with the correct recall of the indications included a high number of prescribed drugs, age over 80 years and male sex. This is in line with a Canadian and a Swedish study, patients taking five or more drugs had worse knowledge [14].

### 4.2 Medication factors

**Product related factor**

It is clear that the elderly often have difficulties with taking their medication, including opening packages, swallowing oral medication and/or reading leaflet information. For example, approximately 9% of people aged 65 years and up to 28% of people aged 85 years or over have problems with swallowing. Since many of the difficulties that the elderly have with medicine formulations are similar to the problems seen in children (e.g. swallowing medication), alignment is needed with the development of formulations for children, taking into account the differences between the two populations. When adapted formulations are developed in the near future, it will be necessary to evaluate these to determine whether these products have indeed led to better health in the elderly [13].

**Adverse Drug Event (ADE)**

The risk of adverse drug events (ADEs) increases with the number of individual medicines a patient is using. Because the elderly are using more medicines in comparison to the younger population, it is expected that more adverse drug reactions occur in people aged 65 and over. A meta-analysis suggested that adverse drug reactions rank between the fourth and sixth cause of death in hospitalized patients [13]. Older patients are also at increased risk of misclassification, given that old age is associated with increased illness, frailty, and disability, which may overlap with symptoms of ADEs, like fatigue, muscle pain and others [15].

**Incorporating indication into medication ordering**

Most of the medicines consumers among older persons in community still do not aware of the purposes of their medications. Indications-based prescribing can contribute to better prescribing and medication use in multiple, synergistic ways. When medication choices are narrowed to those indicated for a specific problem, decisions are much less prone to error. Staff and patients will be able to more easily recognize any mismatches and intercept prescribing or dispensing errors. Knowledge of the indication can also empower patients to question the necessity of a medication [16].

### 4.3 Healthcare provider factors

The health care providers play an important role in establishing a trusting relationship with a patient, because the trust obtained will increase the patients confidence and in the patient’s adherence to medications [17].
Medication Reconciliation A study of elderly patients 2 days after hospital discharge found 64 percent were taking at least one medication that was not ordered, 73 percent failed to use at least one medication according to instructions, and 32 percent were not taking all drugs ordered at discharge.8 Another challenge in reconciliation of medications is determining exactly what medications older adults are taking in their home. One study found 49 percent of community-based older adults kept stores of old medications from the year before, and 6 percent admitted they self-prescribed medications on at least one occasion. Over the counter (OTC) medication use also needs to be assessed, because estimates of older adults’ use of OTC drugs range from 32 percent to 86 percent [18].

4.4 Multidisciplinary approach

Integrated care To provide integrated care to the elderly patient, a multi-disciplinary approach is needed. When the elderly move between different healthcare settings, information may get lost, leading to the unintentional discontinuation of medication, as well as the deprescribing of ADR-causing compounds and other medicines that were intentionally discontinued. This translational care can be improved with organisational changes [12]

4.5 Healthcare system factor

Health care system factors would include issues such as lack of patient education, lack of follow up, lack of medication schedule given, short duration of prescription. For example, with a shorter duration of prescription, the elderly could feel inconvenienced as there is a need for more trips to be made to the pharmacy for medication refills, thus increasing the risk of medication non-adherence when medications are not refilled. Also, when there is a lack of patient education, the patient may not understand the importance of taking medications especially for chronic diseases [17]. In Malaysia, the awareness of the national effort to promote quality use of medicines via the ‘Know Your Medicines’ programme among consumers are marginally good but participation remains relatively low. Of those who had participated in the ‘Know Your Medicines’ programme, majority of the respondents were satisfied with the campaign activities [19].

4.6 Psychological system

Loneliness and family support A US national health interview survey, conducted over the first six months in 1984 showed that one third of the Americans aged 65 and over (an estimated eight million people) were living alone. It has been recognised that even under this circumstance, family support plays an important role in the well-being of the elderly [9].

4.7 Socioeconomic factor

Cost Studies have shown that those who have to pay for medicines out of pocket are more likely to be non-adherence [20]. Other studies have identified financial cost as a reason why elderly patients do not adhere to their medication regimens. For instance, a study by Holt et al. (2014), as well as another by Mishra et al. (2011), revealed lack of finances to procure medications as a reason why the elderly do not adhere to their medications. Similarly, the elderly community-dwelling individuals in the narrative study by Meraz (2017) reported that being able to afford their drugs is of particular concern to them, and they often wondered what they would do if they could no longer afford the cost of their medications [4].

Transportation The study reveals that the major problem confronted by the elderly in the area of activities of daily living is going shopping. The rural elderly are more affected than their urban counterparts. Reduction of agility restricts movement, and together with the expenses and inconvenience of travelling by public transport further aggravates the situation [9]. In Malaysia, We
Care Services or known as ‘Unit Penyayang Warga Emas’ (UPWE) have been recently established on January 2019 by Majlis Pusat Kebajikan Semenanjung Malaysia (NGOs) and supervised by DSW, and they act as medium for accessibility to older persons. They provide transportation to bring the older people to hospital or clinics for health treatment or other purposes [20]. According to the Director of Department of Welfare Malaysia, Zulkhairi Zainol Abidin in Harian Metro said, UPWE recorded that on every 2 days they will be 2 to 4 older persons use the service to go to the hospital and clinic nearby. However this service is still limited to few areas only, thus UPWE is working to enlarge the services and welcoming any collaboration from other NGOs so that this service will be accessible to all senior citizens throughout the country [21].

**Financial and economy status** National Health Morbidity Survey 2015 found an increasing prevalence of chronic illnesses in Malaysia. The increase in chronic illnesses has resulted a rise of healthcare spending in the country. The public health care system largely funded by the government and financed mainly from public tax revenue. The private health care sector provides services on a nonsubsidized, fee-for-service basis, and mainly serves for those who can afford to pay. Health care services by private sectors are funded mainly by private health insurance, consumers’ out-of-pocket payment, and non-profit institution. Therefore, a universal health financing system must be established by transforming the role of budget funding from directly subsidizing provision to subsidizing the purchase of services on behalf of the entire population. The integration of services between the public and private sector is very much needed, at a cost the people can afford [19]

4.8 System Influenced Medication Adherence

*Counselling by telephone* Counselling through phone with a combination of education and medicine review, by the clinic nurse was shown to improve adherence. This study was undertaken over 4-6 weeks in a general medicine clinic in 70 subjects, with a mean age of 72 years. The interventions were a 20 minute teaching session with a review of medicines with or without a follow-up telephone call. Without the telephone call, the increase in adherence was not significantly different from the control group (no intervention). However, with a telephone call, there was a significant increase in adherence [22]

*Technology enabled medication adherence* Internet of Things (IoT) devices to track inferred medication consumption in the seniors’ homes, and provide real-time alerts to community caregivers, who can then intervene in a timely manner. Use of Internet of Things (IoT) technology to monitor the inferred medication consumption (and thus non-adherence) of seniors, through the use of sensorised medication boxes. The system captures the timings and frequencies that the seniors use the boxes [23]

*Use of personal system to reduce barriers to medication adherence* Two common barriers to medication adherence were forgetting to take the medication and/or a change in routine that resulted in failure to take the medication. Most of the older persons claim to have difficulty in remembering the medications to be taken in the middle of the day as for the medications that can been taken upon waking and before sleep are typically not difficult [24].

4.9 Medication management models for polymedicated home dwelling elderly

Optimized medication management at the level of polymedicated, home-dwelling older adults:

a. Organized interventions aimed at optimizing medication management for polymedicated, home-dwelling older adults (ie, single- or multi-professional interactions conducted by nurses, pharmacists, or physicians, such as counselling on medication and medication compliance or patient education sessions).
b. Patient reminder systems aimed at optimizing medication management (i.e., single- or multi-professional interventions conducted by nurses, pharmacists, or physicians, such as telephone contact and discharge planning; medication adherence aids, such as electronic monitors or pill dispensers; and meetings with the multi-professional health care team in the patient’s home [25].

5. Conclusion

Medication management is a complex process that consists of multiple activities. Factors associated with problems in the performance of these activities include living alone, impaired vision, impaired cognitive function, ages 75 and older, having three or more medications and/or scheduled doses in one day, and more than one prescribing provider. Other areas of medication management include assessment and interventions related to medication procurement, medication knowledge, physical ability, cognitive capacity, and intentional non-adherence. Ongoing monitoring of these areas is crucial.

Conflicts of Interest: The authors declare no conflict of interest and the funder had no role in the design of the study; in the collection, analyses, or interpretation of data; and in the writing of the manuscript.

References


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