



## Perceptions of Doctors and Pharmacists towards Medication Error Reporting and Prevention in Kedah, Malaysia: A Rasch Model Analysis

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### Abstract

**Objective:** Reporting of medication errors in Malaysia is currently low. Consequently, the objective of the study is to explore the perceptions of doctors and pharmacists towards reporting of medication errors and to explore perceived factors that could cause or prevent medication errors.

**Method:** The study was a cross-sectional mail survey. All eight primary outpatient care clinics under Kuala Muda District Health Office, Kedah, Malaysia were included. The study targeted all doctors and pharmacists working in these clinics. The survey questionnaire consisted of two domains — perceptions of medication errors reporting and exploration of perceived preventive factors of medication errors. The Rasch model was used in data analysis.

**Results:** A total of sixty-seven questionnaires were received from the eight clinics, giving a response rate of 100%. Doctors believed that patients' knowledge about their medications and counselling by pharmacists are the most important preventing factors of medication errors. Pharmacists believed that compliance with the standard operating procedures, decreasing the heavy workload and patients' knowledge about their medications are the most important preventing factors. Regarding reporting of medication errors, both doctors and pharmacists had relatively the same perceptions. While they did not agree that their workload interferes with their ability to report medication errors, both pharmacists and doctors moderately agreed that individuals could be blamed when an error is reported in the department.

**Conclusion:** The study findings showed that the workload was not a barrier to medication error reporting. Moreover, both doctors and pharmacists stated that prevention of medication errors is a high priority in their work place. However, the fear of blame could prevent some doctors and pharmacists from reporting medication errors. Consequently, reporting medication errors needs to be encouraged in the Malaysian primary care setting building on the current initiatives and activities in Malaysia. This could further promote the culture of medication safety and error reporting.

**Keywords:** Safety; Medication errors; Malaysia; Reporting

### Introduction

Medication errors are not uncommon and can occur at any phase of the complex medication use process (prescription, transcription, dispensing and administration) [1-4]. In fact, medication errors can cause serious clinical consequences and represent a major concern for healthcare professionals and policy makers around the globe [2,4]. Moreover, medication errors can increase the healthcare cost and put a financial burden on the health system [5]. Therefore, one of the strategies to reduce medication errors is to encourage reporting of these errors so that suitable solutions can be made to prevent them from occurring. The analysis of reports and feedback can help to improve the medication safety and make changes at the level of the individual practitioner or the team, at the level of the institution/employer and at the national level [5].

In Malaysia, Ministry of Health — as the health policy maker — has started initiatives and programs to further promote the medication safety. Now, medication error reporting system is in place and health care professionals can report online via the national medication error reporting system (MERS) [6]. Also, medication errors can be reported using the medication error report form and sent via the mail to the National Medication Safety Center (MedSC) [7]. In fact, medication safety is promoted as “Medication safety is Everyone’s Responsibility” [7]. Furthermore, a guideline on medication error reporting was published by Ministry of Health in 2009 to facilitate the reporting

process and provide detailed information regarding medication errors, scope of error reporting, procedures of reporting, types of medication errors, classification of the medication error severity [8].

A medication error is defined by the National Coordination Council for Medication Error Reporting and Prevention (NCCMERP) as “A medication error is any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer. Such events may be related to professional practice, health care products, procedures, and systems, including prescribing, order communication, product labelling, packaging, and nomenclature, compounding, dispensing, distribution, administration, education, monitoring, and use” [9]. Most medication errors involve dose error,

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frequency error, unavailable drug, unavoidable delay, administration error, drug-drug interaction and drug-allergy interaction [10,11].

Healthcare providers particularly physicians and pharmacists are the key players in safe use of medications in primary outpatient care [12,13]. However, medication errors still occur and often go undetected [8]. In Malaysia, medication error reporting is currently on a voluntary basis [8]. With voluntary reporting systems, fears of recrimination or heavy workloads might prevent the reporting of medication errors [11]. Moreover, one study which included 12 Ministry of Health (MOH) primary care clinics from four states in Malaysia showed that medication errors were the most common clinical management errors (41.3% of all management errors) [14]. Another Malaysian study from outpatient pharmacy department in Kelantan state showed that the prevalence of medication errors in prescriptions for geriatric patients was 25.17% [15]. Therefore, exploring pharmacists' and physicians' perceptions is an important step towards developing an effective medication error reporting system as medication errors reporting is dependent on healthcare providers in most cases [16]. Also, it is vital to investigate the preventing factors and the medication safety culture via assessment of prescribers' perceptions to ease the development of a mechanism that could be integrated with the current health system.

To date, healthcare organizations had implemented various programs to improve medication error reporting system. World Health Organization (WHO) stated that patient safety in primary care is an important topic and should be addressed in all countries. Moreover, medication safety incidents are prevalent in primary care setting [17]. Since some medication errors may cause morbidity and mortality, it is needed to further strengthen the current healthcare system with an effective mechanism for monitoring and reporting of errors [8]. As there is paucity of data in this field in Malaysia, therefore, the objective of the study is to explore the perceptions of doctors and pharmacists practising in primary clinics regarding reporting of medication errors and to explore perceived preventing factors of these errors.

## Methods

### Study design

This is a cross-sectional questionnaire-based mail survey.

### Questionnaires development

The survey instrument was developed from the literature relevant to medication safety [12,16,18]. Modifications were done to make it suitable to the local setting. The survey instrument consisted of 2 domains which included respondents' perceptions on preventive factors of medication errors and respondents' perceptions on culture of medication errors reporting. The questionnaire was prepared in English language. The scale used in this study was a five point Likert type rating (1 - Strongly Disagree, 2 - Disagree, 3 - Neither agree nor disagree, 4 - Agree and 5- Strongly Agree). The survey instructions stated that there are no correct or incorrect responses and instructed participants to rate the response that best reflects their perceptions. The survey instrument was reviewed for its validity by a group of experts in the field of medication safety. Moreover, a pilot study was conducted with 15 pharmacists and 15 doctors from outpatient care clinics, Federal Provincial Health Department Kuala Lumpur. Some minor revisions were made based on the comments during the pilot study.

### Study setting, population and sampling

All 8 primary outpatient care clinics under Kuala Muda District Health Office, Kedah, Malaysia were included. The targeted population

was all pharmacists and doctors working under primary outpatient care of Kuala Muda District Health Office. This is a census study as data is gathered on every member of the population (52 doctors and 15 pharmacists). Inclusion criteria were all registered pharmacists and doctors working in primary outpatient care clinics in Kuala Muda District Health Office. The exclusion criteria were provisional registered pharmacists (PRP), pharmacy students attached to the relevant health facilities, doctors under housemanship and doctors or pharmacists on long leave/sick leave.

### Survey administration

A mail survey was sent in November 2013 to all the participants. The survey instrument was accompanied by an addressed envelope (for returning the completed questionnaire) and a cover letter explaining the aim of the study, definition of medication error and confidentiality of all responses from participants. The participants were asked to complete the questionnaires and return them in two weeks time. The first reminder was sent to each pharmacist and doctor approximately after first week. The second reminder was sent after one week of the first reminder.

### Data analysis

All the data received from this survey were entered in the SPSS version 18. Appropriate descriptive statistics were used for data analysis. The Rasch model was used to examine pharmacists and doctors' perception toward preventive factors of medication errors and culture of medication errors reporting.

### Rasch model analysis

Rasch measurement, a form of item response theory, was selected as the primary method of data analysis because it provides advantage over traditional statistical approaches. According to Royal (2010), page 23, Rasch models are "are logistic, latent trait models of probability for monotonically increasing functions. Unlike statistical models that are developed based on data, Rasch measurement models are static models that are imposed upon data. Rasch models assume the probability of a respondent agreeing with a particular item is a logistic function of the relative distance between the person and item location on a linear continuum" [19]. Winsteps measurement software was used to perform the Rasch analysis.

According to Zain et al (2010), "the Rasch model transforms raw item difficulties and raw person scores to equal interval measures of logits on a line in a "meter stick". The idea of a line helps us to determine item positions by considering each item relative to the items already positioned on the line" [20]. Hence, placing logits scale on a meter stick provides equal and standard interval data [20]. Thus, in Rasch model, raw scores are converted into standardized units which are then aligned on a ruler that measures each component of the model [21]. In principle, according to Hardigan and Carvajal (2007), Likert scale data can be used as a basis for obtaining interval level estimates on a continuum by applying the Rasch Model [21]. Results of Rasch models are linear, independent and objective. Hence, inferences can be drawn from them [22].

The equal interval measures transformed by Rasch Model are used to map persons and items onto a linear (interval) scale. Item maps are useful for identifying meaningful constructs, as the graphical illustrations visually display any potential relationships among item responses. The maps showed person distributions on the left and item distributions on the right, along a hierarchy on a common scale. The

numbers along the left column indicate logits, which are the interval level measures produced from ordinal level raw scores when data were computed via Rasch model. The measures essentially serve as a ruler with truly equidistant values. Placing both persons and items on the same scale allows for easy and meaningful interpretation of the results. Such mapping (called person-item maps) produce useful tools for evaluating perceptions towards medication errors and culture of medication errors reporting. The person-item maps provided ways for evaluating and interpreting the data. Items order in the maps illustrates the level of item difficulties. This means that items which more difficult to agree with or items which easier to agree with can be identified.

Markers denoted on the map showed important statistics such as mean (M), one standard deviation (SD) and two standard deviations (T), for both persons and items. Prior to analysing the data, overall collected data were diagnosed in order to provide a precise and productive measurement, same like process of calibrating an instrument [20]. The responses of the 67 doctors and pharmacists were analysed using Ministeps 3.81.0 (Rasch-model computer program). In order the items can be used in the Rasch model, the item infit mean square and outfit mean square should be distributed between 0.7 and 1.4 [23]. These indicators provide evidence of unidimensionality in the data and present evidence of strong content validity [19]. After diagnosing data, the raw data were transformed using Rasch analysis to order pharmacists and doctors along the continuum of the measure of perceptions towards medication errors and culture of reporting.

## Results

### Demographic characteristics of the respondents

A total of 67 questionnaires were received from the clinics under Kuala Muda District Health Office (PKDKM), with a response rate of 100%. The majority of the respondents were female (82.1%) with an average age of  $31.8 \pm 5.70$  years and working experience of  $5.2 \pm 4.36$  years. Of the respondents, 52 were doctors (three of them were family medicine specialists and the rest were general practitioners) while 15 respondents were pharmacists. The total prescriptions per month ranged from 850 to 15,000 prescriptions for all the 8 clinics under PKDKM. Table 1 showed the characteristics of the respondents in details (Table 1).

### Findings

Table 2 and 3 showed the items statistics for perception of preventive factors of medication errors and culture of medication error reporting respectively. For Table 2, the difficulty of items is distributed from -1.64 Logits to 1.76 Logits. The infit mean squares of the items are between 0.65 and 1.40 while the outfit mean squares are between 0.67 and 1.46. For Table 3, the difficulty of items distributed from -1.93 Logits to 2.18. The infit mean squares of the items are between 0.65 and 1.22 while the outfit mean squares are between 0.67 and 1.19. Thus, this data exhibited good fit and supported the uni-dimensionality requirement of the model. The Cronbach alpha coefficients are above 0.7 indicating the questionnaire is reliable.

### Respondents' perceptions of preventive factors of medication errors

The distribution of doctors according to their perception of preventing factors of medication errors and the distribution of items according to difficulty are shown in Figure 1. On the left side, the distribution of doctors was represented. Items located below the participants are the items that doctors were more likely to agree with.

Variable	n (%)
<b>Profession</b>	
Doctors	52 (77.6)
Pharmacists	15 (22.4)
Total	67 (100)
<b>Working experience in current position (years)</b>	
0-4	40 (59.7)
5-9	15 (22.4)
10-14	9 (13.4)
15-19	2 (3)
≥ 20	1 (1.5)
Total	67 (100)
<b>Age (years)</b>	
<30	37 (55.2)
30-39	22 (32.8)
40-49	7 (10.4)
≥ 50	1 (1.5)
Total	67 (100)
<b>Average number of prescriptions per month in respective settings</b>	
850	3 (4.5)
1800	4 (6)
2400	8 (11.9)
2600	2 (3)
2800	4 (6)
3200	3 (4.5)
7300	13 (19.4)
15000	30 (44.8)
Total	67 (100)

Table 1: Characteristics of the respondents (n=67).

The items located above the participants are the items that the doctors were unlikely to agree with. The items distribution on the map has valuable information on doctors' current perception. Figure 1 shows an item-person map in which doctors are placed relative to the hierarchy of items. On the right side, items are listed in order of difficulty, with the hardest to agree with at the top and the easiest item to agree with at the bottom. The same scenario happened to pharmacists as shown in Figure 2.

Regarding doctors' perception, from the item person map in Figure 1, the statement "patients' knowledge about their own medications helps to reduce medication errors" has the lowest difficulty as it was located at the bottom of the scale (-1.82 Logits). In other words, this statement was the most easily agreed on or highly perceived by doctors. The second most easily agreed preventive factor was patient counselling by pharmacists help to decrease the number of medication errors (-1.60 Logits). These two statements were followed by others statements as shown in Figure 1. Statement of "generic substitution has no influence on medication errors" has the highest level of difficulty (1.71 Logits) (located at the top of the scale). In doctors' perception, this statement was the hardest to be agreed on.

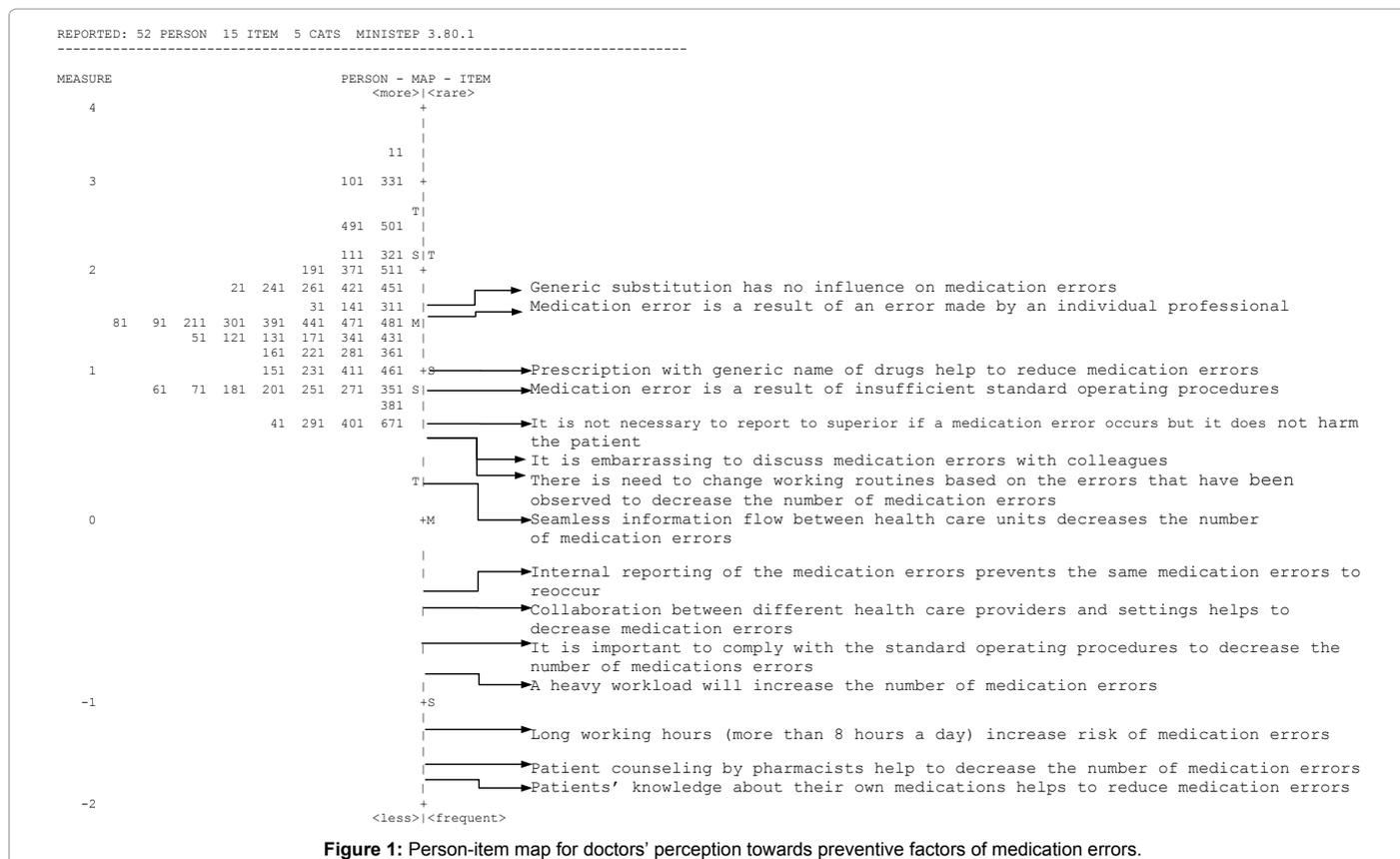
Regarding pharmacists' perceptions of preventive factors of medication errors, from the item person map in Figure 2, there were three statements where pharmacists most easily to agree with (-1.32 Logits). These included "It is important to comply with the standard operating procedures to decrease the number of medications errors", "A heavy workload will increase the number of medication errors" and "Patients' knowledge about their own medications helps to reduce medication errors". Pharmacists had the same perception of doctors towards the statement "generic substitution has no influence on medication errors" as it was the hardest to be agreed on (2.06 Logits).

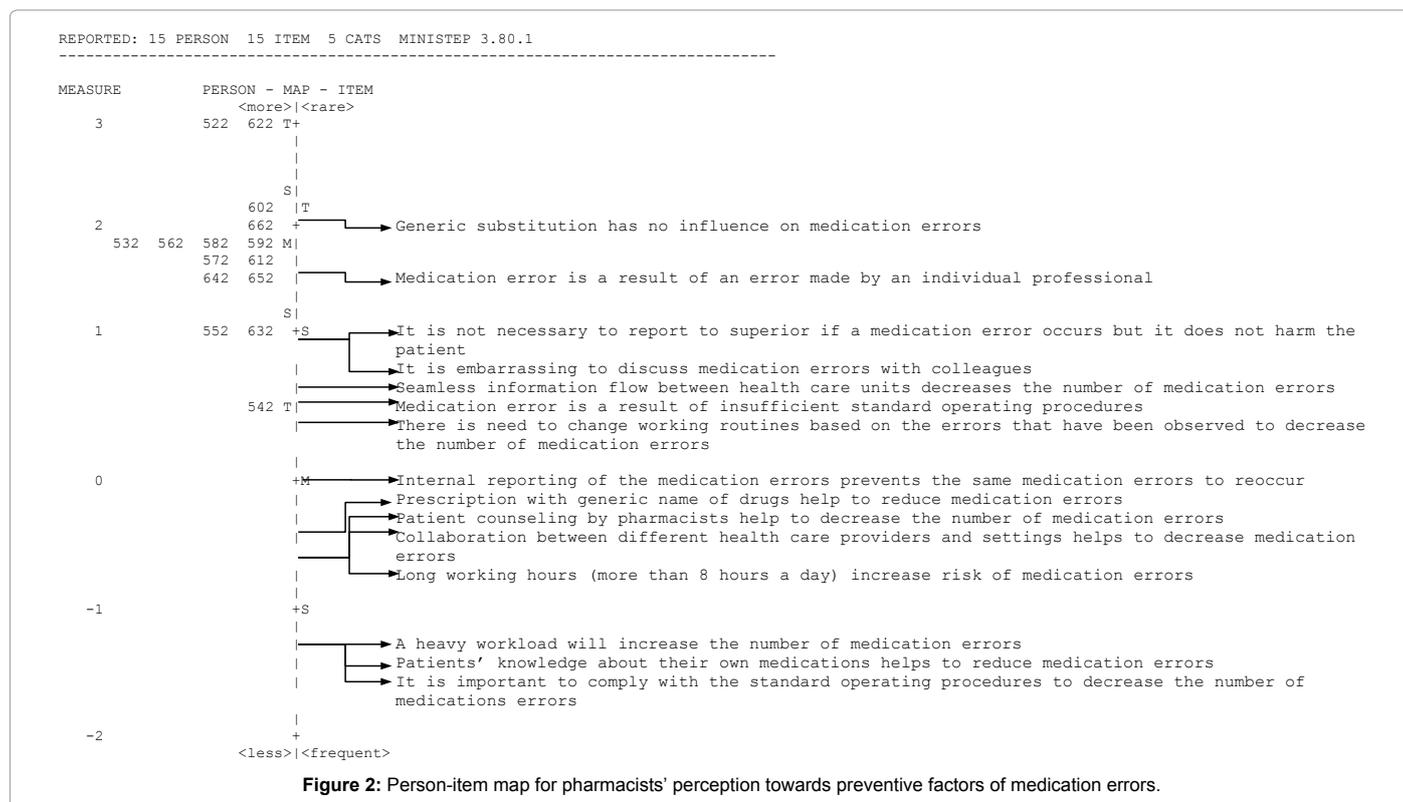
Perception towards preventive factors of Medication Errors	Measure	Infit mean square	Outfit mean square
Generic substitution has no influence on medication errors	1.76	1.35	1.40
Medication error is a result of an error made by an individual professional	1.53	1.11	1.23
Medication error is a result of insufficient standard operating procedures	0.85	0.81	0.83
Prescription with generic name of drugs help to reduce medication errors	0.62	1.41	1.44
It is not necessary to report to superior if a medication error occurs but it does not harm the patient	0.62	1.12	1.26
It is embarrassing to discuss medication errors with colleagues	0.54	1.13	1.24
There is need to change working routines based on the errors that have been observed to decrease the number of medication errors	0.48	0.89	0.95
Seamless information flow between health care units decreases the number of medication errors	0.33	0.67	0.74
Internal reporting of the medication errors prevents the same medication errors to reoccur	-0.34	0.70	0.73
Collaboration between different health care providers and settings helps to decrease medication errors	-0.6	0.82	0.83
It is important to comply with the standard operating procedures to decrease the number of medications errors	-0.74	0.65	0.67
A heavy workload will increase the number of medication errors	-0.92	1.40	1.46
Long working hours (more than 8 hours a day) increase risk of medication errors	-1.12	1.26	1.25
Patient counselling by pharmacists help to decrease the number of medication errors	-1.37	0.73	0.75
Patients' knowledge about their own medications helps to reduce medication errors	-1.64	0.85	0.85

Table 2: Measures and Validity Indices for perception towards preventive factors of medication errors

Perceptions towards culture of medication errors reporting	Measure	Infit mean square	Outfit mean square
My workload interferes with my ability to report medication errors	2.18	1.22	1.19
I afraid of negative consequences associated with medical errors reporting	1.22	1.13	1.12
Individuals will be blamed when an error is reported in my department	0.59	0.55	0.57
Staffs are supported for reporting medication errors	-0.86	0.96	1.02
My department takes an action on reported medication errors (near miss/ incident) to improve medication safety	-1.19	1.17	1.11
Senior officers/managers at my workplace stated that patient safety/prevention of medication error is a high priority	-1.93	0.76	0.75

Table 3: Item statistic for perception towards culture of medication errors reporting.





Both pharmacists and doctors most easily agreed that patients' knowledge about their medications helps to reduce medication errors (-1.32 Logits and -1.82 Logits, respectively). Meanwhile, pharmacists easily agreed that prescriptions with generic names help to reduce medication errors but this was hardly agreed with by doctors (-0.61 Logits and 0.94 Logits respectively).

Table 4 summarizes the comparison of perceptions towards preventive factors of medication errors between pharmacists and doctors from the hardest to agree with (at the top) to the most easily to agree with (at the bottom).

### Perceptions of medication error reporting

For reporting of medication errors, both pharmacists and doctors had the same perceptions. From Figure 3 and 4, item person map showed that they most easily agreed that senior officers/managers at their workplace stated prevention of medication error is a high priority (-1.89 Logits and -2.04 Logits respectively) while it was most difficult to agree that their workload interferes with their ability to report medication errors ( 2.24 Logits and 2.21 Logits respectively)

Table 5 summarizes the comparison of perceptions towards medication errors reporting between doctors and pharmacists.

## Discussion

### Perceptions of preventive factors of medication errors

Both pharmacists and doctors in PKDKM most easily agreed that patients' knowledge about their own medications helps to reduce medication errors. This was contradicting with some studies in literature in which they reported that the most highly perceived factor for medication errors was heavy workload [16,24,25]. In our study, heavy workload was the third and fourth factor to be easily agreed on

by pharmacists and doctors, respectively. Thus, it was not the most highly perceived factor for medication errors.

In fact, human factors can limit the healthcare safety and contribute to medication errors. These factors include inattention, memory lapse, lack of knowledge and interruptions and other several personal and environmental factors [26]. Moreover, poor communication between patients and health care professionals is a major contributing factor to medication errors and adverse drug events [27]. Communication issues include both written and verbal issues. Written communication issues include for example wrong doses and wrong medicines. Verbal communication issues include miscommunication between patients and pharmacists [27].

Generally, if patients are more knowledgeable, errors in treatment may be prevented. This is because anxiety about the uncertainty of treatment can be reduced or alleviated by adequate knowledge [28]. Therefore, patients should learn the name of the medicines that are prescribed to them, as well as dosage, strength and frequency in order to avoid medication errors [29].

For both pharmacists and doctors, the most difficult statement to agree with was that generic substitution has no influence on medication errors. According to Hakonsen et al. (2010) study that was conducted in a large Norwegian hospital to explore the nurses experiences with generic substitution, the nurses in the wards felt insecure about the generic substitution. They also indicated that the large number of generic medications and frequent generic substitutions can lead to medication errors. Moreover, 42% reported that they have experienced errors due to generic substitution primarily because of five reasons that included difficult medicine names, frequent changes in the drug inventory, and the large number of generic medicines, heavy workload and inadequate training [30]. Our study showed that perceptions of doctors and pharmacists were similar to that of nurses on the effect of generic substitution on medication safety.



Doctors (n=52)	Pharmacists (n=15)
<ul style="list-style-type: none"> <li>Generic substitution has no influence on medication errors</li> <li>Medication error is a result of an error made by an individual professional</li> <li>Prescription with generic name of drugs help to reduce medication error</li> <li>Medication error is a result of insufficient standard operating procedures</li> <li>It is not necessary to report to superior if a medication error occurs but it does not harm the patient</li> <li>It is embarrassing to discuss medication errors with colleagues</li> <li>There is need to change working routines based on the errors that have been observed to decrease the number of medication errors</li> <li>Seamless information flow between health care units decreases the number of medication errors</li> <li>Internal reporting of the medication errors prevents the same medication errors to reoccur</li> <li>Collaboration between different health care providers and settings helps to decrease medication errors</li> <li>It is important to comply with the standard operating procedures to decrease the number of medications errors</li> <li>A heavy workload will increase the number of medication errors</li> <li>Long working hours (more than 8 hours a day) increase risk of medication errors</li> <li>Patient counseling by pharmacists help to decrease the number of medication errors</li> <li>Patients' knowledge about their own medications helps to reduce medication errors</li> </ul>	<ul style="list-style-type: none"> <li>Generic substitution has no influence on medication errors</li> <li>Medication error is a result of an error made by an individual professional</li> <li>It is not necessary to report to superior if a medication error occurs but it does not harm the patient</li> <li>It is embarrassing to discuss medication errors with colleagues</li> <li>Seamless information flow between health care units decreases the number of medication errors</li> <li>Medication error is a result of insufficient standard operating procedures</li> <li>There is need to change working routines based on the errors that have been observed to decrease the number of medication errors</li> <li>Internal reporting of the medication errors prevents the same medication errors to reoccur</li> <li>Prescription with generic name of drugs help to reduce medication errors</li> <li>Collaboration between different health care providers and settings helps to decrease medication errors</li> <li>Long working hours (more than 8 hours a day) increase risk of medication errors</li> <li>Patient counselling by pharmacists help to decrease the number of medication errors</li> <li>A heavy workload will increase the number of medication errors</li> <li>Patients' knowledge about their own medications helps to reduce medication errors</li> <li>It is important to comply with the standard operating procedures to decrease the number of medications errors</li> </ul>

**Table 4:** Comparison between Doctors' and Pharmacists' Perceptions towards the Preventive Factors of Medication Errors (from the hardest to agree with on top to the most easily to agree with at the bottom).

Doctors (n=52)	Pharmacists (n=15)
<ul style="list-style-type: none"> <li>My workload interferes with my ability to report medication errors</li> </ul>	<ul style="list-style-type: none"> <li>My workload interferes with my ability to report medication errors</li> </ul>
<ul style="list-style-type: none"> <li>I afraid of negative consequences associated with medical errors reporting</li> </ul>	<ul style="list-style-type: none"> <li>I afraid of negative consequences associated with medical errors reporting</li> </ul>
<ul style="list-style-type: none"> <li>Individuals will be blamed when an error is reported in my department</li> </ul>	<ul style="list-style-type: none"> <li>Individuals will be blamed when an error is reported in my department</li> </ul>
<ul style="list-style-type: none"> <li>Staffs are supported for reporting medication errors</li> </ul>	<ul style="list-style-type: none"> <li>Staffs are supported for reporting medication errors</li> </ul>
<ul style="list-style-type: none"> <li>My department take action on reported medication errors (near miss/ incident) to improve medication safety</li> </ul>	<ul style="list-style-type: none"> <li>My department take action on reported medication errors (near miss/ incident) to improve medication safety</li> </ul>
<ul style="list-style-type: none"> <li>Senior officers/managers at my workplace stated that patient safety/ prevent medication error is a high priority</li> </ul>	<ul style="list-style-type: none"> <li>Senior officers/managers at my workplace stated that patient safety/ prevent medication error is a high priority</li> </ul>

**Table 5:** Comparison between Doctors' and Pharmacists' Perceptions of reporting of Medication Errors (from the hardest to agree with on top to the most easily to agree with at the bottom).

analysed, relevant authorities/agencies can evaluate causes and revise or create processes to reduce the risk of errors [33]. Therefore, staffs should be encouraged to report medication errors. This is because underreporting prevents efforts to avoid future errors. Hence, no changes or improvement in medication safety without efficient reporting of errors.

Both pharmacists and doctors moderately agreed that individuals could be blamed when an error reported in the department. This might

be a barrier to error reporting as healthcare professionals reported feeling worried as well as fearful of being blamed or disciplinary actions following an error would be taken against them [34,35]. Fear of these negative consequences can lead to reporting of errors only when the error could no longer be hidden [36]. Fears of punishment have led to a norm of silence, where silence kills. To eliminate this barrier, individuals and organizations must be able to move from individual blame toward a culture of safety, where the blame of errors is eliminated and reporting is rewarded in order to increase reporting of all types of errors [33].

Both pharmacists and doctors most difficult to agree that workload interferes with their ability to report medication errors. This is different from the findings of previous studies where the barriers to error reporting were due to being busy, extra work needed to do report and incident reports take time to complete [35,37,38]. The difference could be explained that work load might be less in the primary clinics in our study compared to the other studies. In some clinics, the total patients and prescriptions per day was less than 200 and thus it might be not too many for them to deal with. Alternatively, it could be explained that pharmacists and doctors are willing to report errors regardless of the workload. In the year of 2013, only two medication error reports were submitted from pharmacists, with a total prescription of four hundred thirty thousand for that year. Studies on medication errors in Malaysia appeared to be very few in literature. One study which included 12 MOH primary care clinics from four states in Malaysia showed that medication errors were the most common clinical management errors (41.3% of all management errors) [14]. Another study from outpatient pharmacy department in Kelantan showed that the prevalence of medication errors in prescriptions for geriatric patients was 25.17% [15]. Since workload was not a barrier for error reporting in PKDKM, the low medication error reporting rate might be due to the fear of blame or disciplinary action when an error is reported. To avert underreporting and to effectively learn from errors, there is a need for the health policy makers to develop policies that support routine reporting of errors, so that increased numbers of reports of actual and near misses errors are rewarded. By easing the transition of an institution to a culture of safety and eliminating the potential blame, error reporting will most likely increase [13]. Finally, the current culture in safety is that it is neither wholly punitive nor wholly blame-free when errors happen [39]. In fact, it is necessary to create a reporting environment in which reporting errors are rewarded and valued. At the same time, a well-established system of accountability should be in place to confront those individuals who wilfully and repeatedly make unsafe practices or knowingly disregard a risk that would most likely cause a bad outcome to the patient [40].

## Limitations

The study was conducted in one Malaysian state (i.e., Kedah). Therefore, its findings cannot be generalized to the whole country. However, given the paucity of data regarding medication error reporting in Malaysia, we believe these preliminary findings are useful for future guidance for health authorities. Moreover, the current findings warrant a large scale study to further study this medication errors reporting practices.

## Conclusion

Both doctors and pharmacists highly perceived patients' knowledge about their medications help to reduce medication errors and that generic substitution will have influence on medication errors. Pharmacists believed that prescriptions with generic name help to reduce medication errors while doctors did not have this perception. Both doctors and pharmacists indicated that senior officers/managers at work place stated that prevention of medication errors is a high priority. They did not consider workload as barrier to their ability to report medication errors. However, the fear of blame could prevent some doctors and pharmacists from reporting medication errors. Consequently, reporting medication errors should be encouraged in the primary care setting building on the current initiatives and activities in Malaysia to further promote the culture of medication safety.

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