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A Cross-Sectional Study on Knowledge of Ambulatory Patients with Chronic Diseases on Their Medications

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ABSTRACT

Introduction: This study aimed to assess whether patients having their medications for chronic diseases dispensed at the ambulatory/out-patient pharmacy department (OPD) of a tertiary hospital can recall the medication names and intake instructions and determine the variables affecting their knowledge level.

Methods: This cross-sectional survey was carried out at the OPD of a tertiary hospital. Convenience sampling was used to recruit patients on ≥2 chronic medications. Respondents filled a self-administered questionnaire on their demographic background and quality of interaction with pharmacists before investigators asked them to recall their current medications for chronic diseases.

Results: A total of 200 patients were surveyed. The majority were female (60.5%), Chinese (43.0%), completed tertiary education (48.0%), and on a median of 3 medications. Most patients (78.4%) could recall the indications and intake instructions of all their medications, but only 28.1% knew the generic names; higher educated patients have better knowledge of both ($P < 0.01$). Patients with problems recalling their medications should be identified during dispensing, and more attention is given to them to ensure a good understanding of their medications. Quality of interaction with pharmacists was mostly rated as good (84.4%), with pharmacists deemed having sufficient knowledge (86.9%), polite (85.4%), and providing clear instructions (81.9%). Patients perceiving good quality of interaction with pharmacists recalled intake instructions of their

medications better (P = 0.03). Pharmacists should be provided with communication skills training periodically to maintain the quality of interaction.

Conclusion: Patients' education level and quality of interaction with pharmacists affect their ability to recall essential information about their medications. More efforts are needed to educate patients on the generic names of their medications.

Keywords: chronic diseases, generic name, knowledge on medications, out-patient pharmacy department, pharmacy communication

INTRODUCTION

When used appropriately, medications will result in disease prevention, health restoration, and alleviation of patients' symptoms and suffering (1). Unfortunately, irrational use of medications is still prevalent worldwide, with an increasing trend demonstrated in both developing and transitional countries (2). According to the World Health Organization (WHO), more than 50% of patients fail to take prescribed medications correctly (3). Even if the medications are taken correctly, patients may take them blindly with little knowledge of the names of the medications (4-6). Furthermore, patients are also not well-versed with the indication (7,8), administration instructions such as dose and frequency (9), as well as a contraindication and side effects of their medications (5,10). As a result, these patients may easily misuse medications, leading to dire consequences or potentially life-threatening adverse effects. Therefore, it is of utmost importance for patients to possess adequate knowledge and understanding of their medications to achieve optimal health outcomes and improved quality of life (3).

Knowledge of patients regarding their medications was influenced by various modifiable and non-modifiable factors, including age, gender, level of education, living status, professional status, and number of concurrent medications (5,8,10,11). There is unfortunately a lot of heterogeneity regarding the associations between sociodemographic denominators and medication knowledge, suggesting that these associations are population specific. Besides, the role of healthcare professionals in disseminating information on medications to patients can also affect the knowledge of patients on medication use. Patients' knowledge of their medications was found to be influenced by whether pharmacists gave them clear information and instructions (5). Similarly, the lack of patient education provided by prescribing doctors was found to contribute to poor knowledge of patients on their medications (9).

In Malaysia, studies have indicated that patients' knowledge and level of understanding towards their medications are insufficient. A study reported that approximately half of the respondents were unaware of the presence of generic medicines with various brand names and 16.9% of the respondents often did not follow the instructions given or directed by the doctor or pharmacist when administering their medications (9). It had also been reported in the Malaysian National Survey on Use of Medicines (NSUM) that 18.6% of the national population did not have a full

understanding of the proper utilization of their medications and 46.8% did not know the generic names of their medications (11).

In government-operated hospitals and health clinics across Malaysia, outpatient medications are dispensed by pharmacists or pharmacy assistants. The Malaysian Guide to Good Dispensing Practice mandates dispensing pharmacy staff to provide patients with relevant information and clear instructions about their medications and ensure that patients understood them (12). However, the heavy workload faced by many facilities may deter comprehensive delivery of all key information, as pharmacy staff has a limited amount of time to interact with each patient. Similar predicaments are faced in the ambulatory/out-patient pharmacy department (OPD) of Sarawak General Hospital (SGH), which caters to nearly a thousand patients daily. It is unknown whether the high workload impacts the level of service provided, and subsequently affects the knowledge of patients on their medications. Therefore, this study was conducted to explore both issues, with the expectation that identification of specific areas of knowledge deficit will enable a tailored approach to solve them.

METHODS

A cross-sectional survey was conducted at OPD, SGH. Convenience sampling was used to recruit adult patients who had been on ≥2 chronic medications for at least one month, except for those with psychiatric and other cognitive-related disorders. Patients recruited attended the medical, orthopaedics, surgical, ophthalmology, otorhinolaryngology, and gynaecology clinics located at the hospital's outpatient complex. The sample size was calculated based on Raosoft sample size calculator, with a 95% confidence level, 7.5% margin of error, and assumption that half of the population (0.5) can correctly recall the names and intake instructions of all of their medications.

A two-part survey questionnaire was utilized for data collection: (i) a self-administered section on respondents' demographic data and evaluation of the quality of most recent interaction with a pharmacy staff; and (ii) an investigator-administered section on respondents' knowledge of their medications for chronic diseases. The questionnaire was mainly modified from a study conducted by Hirko and Edessa (2017) (5). Items that were not relevant to the study objectives, for example, knowledge on drug interaction(s) and expected treatment outcome(s) were excluded. An item to

determine knowledge on medication names was expanded to better clarify whether patients identify them based on international non-proprietary (generic) names, brand names, or shapes, and colours of the pills. It was initially prepared in English, before being translated into Mandarin and Malay by a pharmacist proficient in all three languages. Study investigators, who all understood English, Mandarin, and Malay, evaluated the three versions and found them adequate to be used with minor alterations after discussion. Face and content validation were carried out by three senior pharmacists in SGH. A pilot study was also conducted on 30 patients to ensure proper interpretation of the questionnaire, especially the translated versions, as well as to enable data collectors to be familiarized with the questionnaire.

Data collection was carried out between September 2018 and March 2019. Patients waiting for their medications to be dispensed were approached and invited to take part. The rationale of the research was explained to those eligible, and upon obtaining informed consent, respondents were asked to self-administer the first section of the survey in the presence of researchers, allowing clarification of any doubts. Subsequently, they were asked to recall the name of the medications that they had been taking over the past month, as well as the indication and intake instructions. The answers were tallied with their actual prescribed medications. Their missed dose and excess medication management methods were also elucidated.

Data were initially entered into Microsoft Excel, before being analyzed using SPSS version 22.0. Descriptive data were presented as frequencies and percentages, whereas associations between selected variables were determined using the Chi-square test.

The research was registered with the National Medical Research Register with the registration number NMRR-18-1692-42449(IIR) and ethical approval was granted by the Medical Research and Ethics Committee (MREC), Ministry of Health Malaysia [KKM/NIHSEC/P18-1636(6) dated 16 August 2018].

RESULTS

Table 1: Demographic Profile of Respondents

Characteristics	Frequency (n)	Percentage (%)
Gender		
Male	79	39.5
Female	121	60.5
Age (years old)		
18-29	26	13.0
30-39	37	18.5
40-49	51	26.5
50-59	43	21.5
>60	43	21.5
Ethnicity		
Malay	63	31.5
Chinese	86	43.0
Iban	25	12.5
Bidayuh	13	6.5
Others	13	6.5
Highest level of education		
No formal education	8	4.0
Primary	22	11.0
Secondary	74	37.0
College/University	96	48.0
Occupation		
Government	55	27.5
Private/self	74	37.0
Retired	36	18.0
Student	9	4.5
Unemployed	26	13.0
Marital status		
Married	133	66.5
Single	60	30
Divorced/widowed	7	3.5
No of medications		
0 - 4	150	75.0
5 or more	50	25.0

A total of 200 respondents were surveyed, with their demographic data as illustrated in Table 1. The majority were female, Chinese, completed tertiary education, and on a median of 3 medications. Nearly 40% of them were on concurrent herbal or traditional complementary supplements.

Table 2: Respondents Knowledge on All the Medications Being Taken by Them

Characteristics	Frequency (n)	Percentage (%)
Generic name of medications		
Know all	55	27.5
Know partial or none	145	72.5
Brand name of medications		
Know all	23	11.5
Know partial or none	177	88.5
Shape and colours		
Know all	156	78.0
Know partial or none	44	22.0
Indication of medications		
Know all	173	86.5
Know partial or none	27	13.5
Frequency of medications		
Know all	181	90.5
Know partial or none	19	9.5
Dose of medications		
Know all	181	90.5
Know partial or none	19	9.5
Timing of medications intake		
Know all	178	89.0
Know partial or none	22	11.0
Side effect		
Know all	25	12.5
Know partial or none	175	87.5
Knowledge of full administration instructions ***(all correct for indication, frequency, dose, and time of intake)***		
Know all	156	78.0
Know partial or none	44	22.0

In terms of medication knowledge, 78.0% of them knew the full administration instructions of their medications, including indication, frequency, dose, and timing of intake. Findings on individual components are illustrated in Table 2. Respondents with higher education levels and working in the government sector were found to have a better understanding of this aspect (Chi-square test, $P < 0.01$). Only a small percentage (12.5%) were aware of the major side effects of their medications. Similarly, only 27.5% and 11.5% knew the generic names and brand names of all their medications respectively, with the majority identifying their medications based on their shapes and colours. Respondents who were younger and higher educated had better knowledge of generic names of their medications (Chi-square test, $P < 0.01$). No significant association was found between knowledge level and number of medications. Associations between the demographic profile of patients and their medication knowledge are illustrated in Table 3.

On the safe use of medications, most respondents had no problems understanding the label on their medications (95.5%) and taking them according to the instructions on the label (92.5%). However, only 39.0% were aware that herbal supplements can interact with their medications, and 61.5% felt that their knowledge of their medications is satisfactory. Missed dose and excess medication management were mainly appropriate (Table 4).

Most respondents had a favourable experience interacting with pharmacy staff, with 84.5% rating the overall quality of interaction as good. Pharmacy staff was deemed to have adequate knowledge (87.0%) and polite (85.5%), besides providing clear instructions (82.0%) and conversing in a clear voice and intonation (87.5%). Respondents who perceived better quality of interaction with pharmacy staff have a better understanding of the administration instructions of their medications (Chi-square test, $P < 0.01$).

Table 3: Associations Between Demographic Profile and Knowledge

Variable	*n*	Generic name				Intake instructions*			
		Poor knowledge	Good knowledge	X^2 stat (df)	*P* value	Poor knowledge	Good knowledge	X^2 stat (df)	*P* value
Gender									
Male	79	58(73.4)	21(26.6)	0.06 (1)	0.81	20(25.3)	59(74.7)	0.84 (1)	0.36
Female	121	87(71.9)	34(28.1)			24(19.8)	97(80.2)		
Age									
18-29	26	15(57.7)	11(42.3)	17.23 (4)	***< 0.01***	4(15.4)	22(84.6)	7.20 (4)	0.13
30-39	37	19(51.4)	18(48.6)			4(10.8)	33(89.2)		
40-49	51	39(76.5)	12(23.5)			10(19.6)	41(80.4)		
50-59	43	35(81.4)	8(18.6)			12(27.9)	31(72.1)		
>60	43	37(72.5)	6(14.0)			14(32.6)	29(67.4)		
Education level									
No education	8	7(87.5)	1(12.5)	20.04 (3)	***< 0.01***	6(75.0)	02(25.0)	26.41 (3)	*<0.01*
Primary level	22	21(95.5)	1(04.5)			8(36.4)	14(63.6)		
Secondary	74	61(82.4)	13(17.6)			21(28.4)	53(71.6)		
Tertiary	96	56(58.3)	40(41.7)			9(09.4)	87(90.6)		
Occupation									
Government	55	37(67.3)	18(32.7)	7.75 (4)	0.10	3(05.5)	52(94.5)	18.42 (4)	*<0.01*
Private/self	74	55(74.3)	19(25.7)			24(32.4)	50(67.6)		
Retired	36	26(72.2)	10(27.8)			8(22.2)	28(77.8)		
Student	09	4(44.4)	5(55.6)			0(00.0)	9(100)		
Unemployed	26	23(88.5)	3(11.5)			9(34.6)	17(65.4)		
No. of medications									
0-4	150	104(69.3)	46(30.7)	3.02 (1)	0.08	29(19.3)	121(80.7)	2.49 (1)	0.12
5 or more	50	41(82.0)	9(18.0)			15(30.0)	35(70.0)		

Table 4: Missed Dose and Excess Medication Management

Characteristics	Frequency (n)	Percentage (%)
Missed dose management		
Claimed compliant	47	23.5
Skip the missed dose	103	51.5
Take immediately	45	22.5
Other answers	5	2.5
Excess medication management		
Continue to take	65	32.5
Give back to pharmacy	71	35.5
Throw away	8	4.0
Usually no excess	53	26.5
Oher answers	3	1.5

DISCUSSION

This study elucidates the knowledge of patients on their chronic medications, as well as its association with their demographic background and perceived quality of interaction with pharmacy staff. Overall, the results demonstrated that most of the patients knew the indications and administration instructions of their medications, but not the generic or brand names. Both facets of medication knowledge are positively associated with patient's education level, whereas the quality of interaction with pharmacy staff influences knowledge on administration instructions.

The findings on patients' medication knowledge provide us assurance that most patients on chronic medications in this hospital have basic knowledge of their medications. It compared favourably with the study conducted by Hirko and Edessa (2017), which served as the major reference for this study, with superior knowledge on the intake instructions of their medications. This may be attributed to the education status of our sample, where 48.0% completed tertiary education compared to 22.0% in their study. A positive association between education level and patients' understanding of their medications had been found in this study and existing literature (5,13). Nevertheless, the fact that approximately one in five patients was not able to recall intake instructions is still a concern. Knowledge on indication and dosage regimen was found to predict patients' adherence, hence can potentially affect their health outcomes (14,15). Efforts should be intensified to identify patients with inadequate knowledge of their medications during routine dispensing so that interventions can be done to improve their knowledge. Pharmacy staff had to

be conscious that patients may not fully understand what was instructed during dispensing, and actively look out for indicative signs, especially if they are working among a population with low education level. Alternatively, verbal dispensing can be supplemented with written instructions or pictorial aids for patients, which may enhance their knowledge of medications (5).

Another major issue identified by the study is that most respondents knew neither the generic names nor brand names of their medications, resorting to visual identification using shapes and colours. This was significantly lower than the finding of NSUM, where 53.2% of respondents claimed to be knowledgeable about the names of medicines (6). The reliance on visual identification increases the risk of patient confusion and administration errors as different brands of the same medication can be supplied to patients. Similarly, patients who practised visual identification were found to have worse medication adherence and health outcomes compared to those knowing medicine names (16). Knowledge deficit on this aspect was found to be more prevalent among older patients and those with lower education levels. This is likely contributed by cognitive or memory deficits, as well as reduced exposure to health and medicine education compared to younger and higher educated patients. It may also be compounded by the fact that pharmacy staff does not routinely inform patients on the generic names of the medications during dispensing, especially when there are many items per prescription, focusing on the indication and administration instructions instead. Patients' lack of knowledge on side effects may be attributed to the same reason, as this aspect was found to be seldom discussed by pharmacists (17). Pharmacy staff should ideally provide patients with all pertinent information regarding their medications, and employ the teach-back approach to ensure correct understanding (18). Realistically, resource constraints limit the time pharmacy staff can spend educating a patient on their medications during dispensing. Various approaches should be explored to address this, including providing patients opportunities to make an appointment for extended counselling sessions or developing dedicated websites where they can learn more about their medications.

The favourable perception regarding interaction with pharmacy staff, and significant association with understanding on indication and administration instructions of medications is consistent with the findings of Hirko and Edessa (2017). This further highlights the importance of communication skills for pharmacists. Training should be provided for pharmacy staff to ensure competency, as

well as having their performance in this aspect evaluated, preferably via a simulated patient approach (19). It is also important to ensure that the fast-paced nature and high workload of ambulatory pharmacies do not limit the opportunities for patients to seek further clarification on their medications. Approximately half of the patients who received their medications in a fast-paced emergency centre were found wishing for more information (15). It may be good practice for pharmacy staff to enquire patients whether they need more information during the dispensing process, tailoring the type and amount of information to their needs, rather than providing similar information to all patients (20).

In Malaysia, nationwide efforts had been carried out by the Pharmaceutical Services Division to improve patients' basic knowledge of their medications, via the *"Know Your Medicines"* campaign. This campaign utilized various media to introduce the *"five rights"* of medications to patients, including roadshows, games, exhibitions, and talks (6). A national survey conducted in 2015 found out that half of the population sampled were aware of this campaign (6). Periodic audits such as this study can serve as a yardstick to determine the effectiveness of such campaigns, as well as provide quality assurance on the role of pharmacy staff in ensuring that patients understand their medications and manage them properly.

There were several limitations in this study. First, it is exploratory, hence may not have the statistical power to be generalized to other populations. Nevertheless, it provides a useful snapshot of the status of patient knowledge on their chronic medications and areas for improvement. The medical history of respondents including type and number of chronic diseases were also not collected. For future studies, it is suggested that authors focus on specific disease groups, for example, patients with diabetes or hypertension rather than generalized chronic diseases. Patients' knowledge of their medications may vary according to disease state, hence such focus will provide information and associations that are tailored to a specific disease group. As the survey forms were distributed and filled in the presence of pharmacists, acquiescence and social desirability biases cannot be ruled out. Future studies should employ non-medical related personnel to administer the questionnaire. Recall bias may also affect some of the responses, as participants were required to recall their experience dealing with pharmacy staff during their previous visit to the pharmacy, which can range from one to three months ago.

CONCLUSION

Patients' knowledge of their chronic medications is still lacking in certain aspects, especially the generic names of the medications. As the level of knowledge will impact their adherence level, continuous efforts to remedy this had to be carried out, especially among those who are less well-educated. Dispensing pharmacists must be well-equipped with competent communication skills and the ability to tailor information to the knowledge level of patients, to balance the need to provide an efficient service and ensure patients have all the basic knowledge on their chronic medications.

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