



A PILOT STUDY ON PATIENTS' KNOWLEDGE, ATTITUDE AND BELIEFS ON MEDICATION COMPLIANCE AMONG MEDICAL OUT-PATIENT PHARMACY, MALAYSIA

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Abstract: The aim of this study is to evaluate a human behaviour on the pharmaceutical care and compliance. A cross-sectional multifactorial survey was conducted among Out-Patient Pharmacy Department of Hospital Tuanku Ja'afar, Seremban Malaysia. Universal sampling technique was employed for data collection by using validated questionnaire while convenience sampling was done on pilot study. All the analysis was done by using SPSS 15® and excel 2007. From the 64 subjects, the proportion of male and female were 53.1% ($n = 34$) and 46.9% ($n = 30$), respectively. Based on the age scale of the respondent, the majority answered questionnaires were from age group of 41 to 60 years old with 40.6% ($n = 26$), followed by 29.7% ($n = 19$) from those above 61 years old and 25.0% ($n = 16$) from age range of 21 to 40 years old. The least was from the age group of 20 years old and below (4.7%). The patients were more susceptible to use the medication for the disease in study with increasing age. Patient's gender, age scale, education level and employment status has shown to have a significant association with patient's attitude with p value (Pearson chi-square) of 0.013, 0.045, 0.050 and 0.035, respectively ($p < 0.050$). On the other hand, the rest of the demographic data has shown insignificant association with $p > 0.050$. The race has shown significant P value (Pearson Chi-Square) of 0.034 ($p < 0.05$) with attitude. There is a significant association

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between the beliefs or worrying of taking the medicine with forgetfulness to take their medicine and also stopping the medicine when they feel worse. This is proven by the significant p value (Pearson chi-square) of 0.026 and 0.029, respectively ($p < 0.05$). In conclusion pharmacist intervention and Patient's attitude towards their health management, knowledge and beliefs towards their medication has a significant effect on the pharmaceutical care to develop appropriate compliance.

Keywords: knowledge attitude and beliefs; medication compliance; pharmacy practice; out-patient; diabetic mellitus.

INTRODUCTION

Patient compliance from a pharmacist point of view is largely dependent upon the communication of information necessary for the correct use of medication in association with supportive advice or counselling (Melissa et al., 2007). Counselling often involves the giving of advice and making certain that the advice is understood after listening sympathetically to the patient's doubts, problems or viewpoint. A suitable environment is very important for effective counselling (Jepson, 1995).

There is an emerging of new trend within the non-compliance literature which is to examine the role that the pharmacist plays in determining patient compliance. Furthermore, pharmacists are suggested to have direct contact with patients while patients are engaged in their medical regimen (Selen et al., 2003). The patient must play a role in improving their compliance where much of the current literature on non-compliance concentrates on the patient's role in determining adherence to treatment (Sarah, 2009). Being 'compliant' encompasses the patient to actively participate in his or her own healthcare. This includes seeking medical advice, keeping appointments, following recommendations concerning life style, diagnostic investigations, and medical and surgical regimens. Non-compliance is typically associated with a patient characteristic.

Compliance is a well known issue in pharmaceutical care (Albert and Thomas, 2004;

Bender, 2002; Clark et al., 2004; Cramer et al., 2008; Lowry et al., 2005; Sanaz et al., 2006; Trewin and Veitch, 2003; Yilmaz et al., 2004; Youssef and Moubarak, 2002). So we come to hypothesised that patient behaviour is not a true predictor for medication compliance in out-patient pharmacy. So our aim was

"to assess the pharmacist intervention in providing their pharmaceutical service during dispensing/counseling at the out-patient department and satellite department and patients knowledge attitude and beliefs about the medication intake".

METHOD(S)

The population for this study was selected from the Out-Patient Pharmacy Department of Hospital Tuanku Ja'afar, Seremban. The inclusion criteria was to select those who are under follow-up with the Medical Out-Patient Clinic (MOPD Clinic). The research was conducted as a cross-sectional survey study using a set of validated questionnaires (Cronbach's α 0.83). By using 'Raosoft® Sample Size Calculator' (2008), a total of 100 questionnaires was distributed to patients. However, in order to get 95% Confidence Interval (CI), sample calculation was carried out and a total of 80 samples were needed. However, 100 questionnaires were distributed and only 64% responded¹⁸ Universal sampling was chosen in this study. On other hand convenience

sampling was used in preliminary fieldwork and pilot study (Dawson and Trap, 2004; Erniani et al., 2008).

The inclusion criteria for the sample in this research includes that the patient is either coming to get their medication from the Out-Patient Pharmacy Department at the Hospital Tuanku Ja'afar, Seremban. Whereas, the exclusion criteria including the patients who were unable to understand and write in Malay or English language. Patient without prescription of anti-hypertensive or/and anti-diabetic or/and asthma medication were also excluded during the sampling.

Approval of this study was obtained from the Director of Hospital Tuanku Ja'afar. The chief of Pharmacy department as well as the head of out-patient department was also informed. The sample that has been distributed with the questionnaire was also informed on the purpose of this research.

Questions of this survey were adapted from several previous studies and modified with additional question to suit with the local subjects (Gascón et al., 2004; Reynolds et al., 2004). The set of questionnaire was developed in Malay language and English language only. The questionnaire consists of three sections of Sections A-C. These sections are a combination of five major domains. Domain 1 is mainly focusing on the demographic profile of the patient. Domain 2 is the patient's attitude towards medication. Domain 3 is related to the knowledge of the patient towards disease management and medication. Domain 4 is focusing on the pharmacist intervention during medication dispensing and counselling. The last domain consisted of patient's belief in medication and its effects towards health in general.

All the relevant data recorded in the questionnaire form was analysed using the

Statistical Package for the Social Science (SPSS) version 15.0, Microsoft Excel 2007 and Analyse it software. Out of 100 copies of questionnaires being distributed, a total of 64 copies were obtained. The response rate was recorded as 64%.

The information collected includes the demographic profile, patient's knowledge on their medication, and patient's belief of their medication, their attitude and also the pharmacist intervention during dispensing of medication. Descriptive data was presented as findings of these data on either percentage or/and frequency and tabulated accordingly. Chi-square was also used as to see if there is any association between the domains being studied.

RESULT(S) AND DISCUSSION

In this study, 100 questionnaires were distributed only 73 questionnaires returned in response to survey, but 64 (87.7%) selected for study analysis as 9 (12.3%) questionnaires subject responded with incomplete answers. So study response rate was 73%. The demographic and background data of the subjects were summarised and tabulated in Table 1.

From the 64 subjects, the proportion of male and female were 53.1% ($n = 34$) and 46.9% ($n = 30$), respectively. Based on the age scale of the respondent, the majority answered questionnaires were from age group of 41 to 60 years old with 40.6% ($n = 26$), followed by 29.7% ($n = 19$) from those above 61 years old and 25.0% ($n = 16$) from age range of 21 to 40 years old. The least was from the age group of 20 years old and below (4.7%). The results shown that patient were more susceptible to use the medication for the disease in study with increasing age.

The race classification of subject involved were equivalent in number for both Malay

Table I Table of demographic and background data of subjects

		Frequency (n = 64)	Percent (%)	Valid Percent (%)
Gender				
Valid	Male	34	53.1	53.1
	Female	30	46.9	46.9
	<i>Total</i>	64	100.0	100.0
Age scale				
Valid	20 years old and below	3	4.7	4.7
	21 to 40 years old	16	25.0	25.0
	41 to 60 years old	26	40.6	40.6
	61 years old and above	19	29.7	29.7
	<i>Total</i>	64	100.0	100.0
Race				
Valid	Malay	28	43.8	43.8
	Chinese	8	12.5	12.5
	Indian	28	43.9	43.8
	<i>Total</i>	64	100.0	100.0
Education level				
Valid	None	4	6.3	6.3
	Primary	12	18.8	18.8
	Secondary	30	46.9	46.9
	College	9	14.1	14.1
	University	9	14.1	14.1
	<i>Total</i>	64	100.0	100.0
Employment status				
Valid	Unemployed	16	25.0	25.0
	Student	4	6.3	6.3
	Private	10	15.6	15.6
	Government	7	10.9	10.9
	Self-employ	5	7.8	7.8
	Retired	22	34.4	34.4
	<i>Total</i>	64	100.0	100.0

(continued)

Table 1 Table of demographic and background data of subjects (continued)

Smoking status				
Valid	Smoking	8	12.5	12.5
	Not Smoking	56	87.5	87.5
	Total	64	100.0	100.0
Concomitant disease				
Valid	Cardiovascular	2	3.1	3.1
	Hypertension	12	18.8	18.8
	Diabetes Mellitus	11	17.2	17.2
	Asthma	13	20.3	20.3
	CVS & HPT	4	6.3	6.3
	DM & HPT	11	17.2	17.2
	CVS & DM & HPT *	8	12.5	12.5
	CVS & DM & Asthma	1	1.6	1.6
	HPT & DM & Asthma	1	1.6	1.6
	CVS & DM & HPT & Asthma	1	1.6	1.6
	Total	64	100.0	100.0

Note: *CVS = Cardiovascular disease; HPT = Hypertension; DM = Diabetes mellitus.

and Indian with 43.8% ($n = 28$) each. The Chinese being the minority responded only 12.5% ($n = 8$). Education level was also assessed during this study and shown that 46.9% ($n = 30$) were having secondary school qualification. This is followed by those who only had their education up to primary school (18.8%) and 14.1% ($n = 9$) for the college and university graduates each. There was also a small number of subject that never been into any teaching institution before (6.3%).

As reference to the results obtained in Table 2, the frequency of the answers of the questions given as related to patient's attitude towards medication compliance has been obtained and summarised. The patient had been asked with six questions

that they had answered with either 'Yes' or 'No' as an answer. For question A1, majority of the subject (98.4%, $n = 63$) answered yes that they checked the instruction before taking any medication, where only one person answered no.

Patient was also asked if they ever had forgotten to take their medication, where 60.9% ($n = 39$) answered they did forget and 39.1% ($n = 25$) never forgets to take their medication. This can be related to the developmental and validation of a multidimensional questionnaire assessing non-adherence to medication which is provided by Ernani et al. (2008) the QAM-Q (Medication adherence questionnaire) by Morisky et al. (1983). The study shown that the affirmative response to 'Do you ever

forget to take your medication?" may classify the individual as non-adherent.

A multicenter, cross-sectional study done by Reynolds et al. (2004) regarding factors influencing medication adherence beliefs and self-efficacy in persons naive to antiretroviral therapy stated that the most common reasons for non-adherence to the medications were 'simply forgot' (33%), 'away from home' (27%) and 'busy' (26%). Question A3 implies that majority of the patient did not stop taking their medication when they feel better (64.1%, $n = 41$), while a group

of 35.9% ($n = 23$) did stop taking their medication at times when they feel better. About 56.3% ($n = 36$) of the subjects occasionally stop taking their medication if they feel worse while taking it. Whereas, 43.8% ($n = 28$) did not stop with medication when they feel worse while taking it. This shown that patient takes their medication as response to what effects they were experiencing from the medication. Patient should be advised to continue their medication unless being told by the physician that it is contraindicated or such worsen of side effects.

Table 2 Table of patient's attitude towards medication compliance

		Frequency ($n = 64$)	Percent (%)	Valid percent (%)
A1: You check the instructions before using any medication?				
Valid	Yes	63	98.4	98.4
	No	1	1.6	1.6
	Total	64	100.0	100.0
A2: Do you ever forget to take your medication?				
Valid	Yes	39	60.9	60.9
	No	25	39.1	39.1
	Total	64	100.0	100.0
A3: When you feel better, do you stop taking your medication at times?				
Valid	Yes	23	35.9	35.9
	No	41	64.1	64.1
	Total	64	100.0	100.0
A4: If you feel worse when taking the medication, do you occasionally stop taking it?				
Valid	Yes	36	56.3	56.3
	No	28	43.8	43.8
	Total	64	100.0	100.0
A5: Do you ever take your medicines not as directed?				
Valid	Yes	17	26.6	26.6
	No	47	73.4	73.4
	Total	64	100.0	100.0
A6: I follow the correct instructions given by the pharmacist while taking the medication				
Valid	Yes	60	93.8	93.8
	No	4	6.3	6.3
	Total	64	100.0	100.0

Monreal et al. (2002) wrote in his study of 'Compliance to antiretroviral medication' as reported by AIDS patients assisted at the University Hospital of the Federal University of Mato Grosso do Sul' that the reasons given for non-compliance by the patients were absent-mindedness or forgetfulness (67.7%), lack of medicine (41.9%), side effects (21.5%), complexity of prescribed regimens (12.9%), fatigue (9.7%) and voluntary interruption (7.5%).

About 26.6% ($n = 17$) answered yes upon being asked with 'Do you ever take your medicines not as directed', whereas 73.4% ($n = 47$) answered no. This can be seen where majority of the subject followed the correct instructions given by the pharmacist while taking the medication (93.8%, $n = 60$), whereas 6.3% ($n = 4$) compromise with the instructions. This showed a lower value of patients ignoring or compromising instruction concerning their medication as compared to a research done by Albert and Thomas (2002) regarding medication compliance which indicates that 30–50% of all patients in their research ignore or otherwise compromise the instructions.

From all of the demographic data being collected, only four of them showed significant association with patient's attitude. Patient's gender, age scale, education level and employment status has shown to have a significant association with patient's attitude with p value (Pearson chi-square) of 0.013, 0.045, 0.050 and 0.035, respectively ($p < 0.050$). On the other hand, the rest of the demographic data has shown insignificant association with $p > 0.050$.

Patient's knowledge on medication was analysed and tabulated in Table 3. There were four questions being asked to each of the subjects under this domain. In the first question, 85.9% ($n = 55$) of the subjects know the name of at least one of the medications that they have been taking, whereas

14.1% ($n = 9$) answered no. According to Zanier et al. (2003) in her study of psychopharmacological treatment especially regarding patient's knowledge about their medication, it indicated that most patients demonstrated a good knowledge about drug's name (77%) and daily dose (74.3%).

Again, majority of the subjects can identify the type of tablet that they are taking (90.6%, $n = 58$) and a minority of 9.4% ($n = 6$) cannot identify. However, from a medication compliance research done by Albert and Thomas (2004) they obtained a different response where it indicates that 60% of all patients cannot identify their own medication. About 26.6% ($n = 17$) of the subjects in the study would check the information regarding their medication from the newspaper and 73.4% ($n = 47$) did not use the same source. According to Trewin and Veitch (2003) who is trying to prove the patient source of drug information and attitudes to their provision using a corticosteroid model, they found out that the preferred source of drug information was: doctor (35%), pharmacist (11%) and nurse 4%. Although pharmacists featured as the preferred source of drug information for some patients, a much more detailed investigation is needed of patients' attitudes to the profession and to individuals' consultation and communication skills.

Although 73.4% ($n = 47$) of the subjects had received information/education about hypertension/Asthma/Diabetes Mellitus, there is still about 26.6% ($n = 17$) did not being informed. A much better knowledge of the disease itself may help to explained what to the patient the effect and importance of the medicines to treat it. Overall, there was no association with other demographic data with p value of more than 0.050, but however, the race has shown significant P value (Pearson Chi-Square) of 0.034 ($p < 0.05$) towards this question.

Table 3 Table of patient's knowledge on medication

		Frequency (n = 64)	Percent (%)	Valid percent (%)
K1: Do you know the name of at least one of the medications that you have been taking?				
Valid	Yes	55	85.9	85.9
	No	9	14.1	14.1
	Total	64	100.0	100.0
K2: I can identify the type of tablet I am taking				
Valid	Yes	58	90.6	90.6
	No	6	9.4	9.4
	Total	64	100.0	100.0
K3: I would check the information regarding my medication from the newspaper				
Valid	Yes	17	26.6	26.6
	No	47	73.4	73.4
	Total	64	100.0	100.0
K4: Have you received any information/education about hypertension/Asthma/Diabetes Mellitus?				
Valid	Yes	47	73.4	73.4
	No	17	26.6	26.6
	Total	64	100.0	100.0

A total of 96.9% ($n = 62$) of the subjects can understand the language that is used by the pharmacist. However, it was quite surprising to see that they are still 3.15 ($n = 2$) do not understand the language being used. The entire pharmacist at the out-patient pharmacy department explained to each subjects the instruction on how to take the medicine (100%, $n = 64$).

In question P3, patient was asked whether they had ever received any wrong medication not being prescribed by their physician, 67.2% never received any wrong medication but there are still 32.8% ($n = 21$) had experienced it. Incidence where patient is being given with a wrong medication should not exist. This is crucial since patient should be getting the right medication for the right indication.

About 62.5% ($n = 40$) of the pharmacist at the counter explained to the patient on the side effects of the drugs, whereas 37.5% ($n = 24$) did not include the explanation during the dispensing/counseling. The Impact of Managed Pharmaceutical care on Resource Utilization and Outcomes in veterans Affairs Medical Centers (IMPROVE) relates that the pharmacist intervention in adjusting patient's drug regimens as well as identifying and preventing drug related problem may improve patient adherence (Haslam et al., 2004; Kelly et al., 2007; Mona et al., 2000).

The patient's belief in effects of medication towards their health has been summarised. Five questions related to the patient's belief or perception was being asked in the questionnaires. About 82.8% ($n = 53$) agrees that

Table 4 Patient knowledge and behaviour medication compliance in out-pharmacy

The Pharmacist explained to me on the side effects of the drugs	I can identify the type of tablet I am taking			p Value (Pearson Chi-square)
	Yes	No	Total	
Yes	39	1	40	0.015
No	19	5	24	
Total	58	6	64	

Association between pharmacist's interventions with patient's attitude

I never received any wrong medication not being prescribed by my physician	Do you ever take your medicines not as directed			p Value (Pearson Chi-square)
	Yes	No	Total	
Yes	8	35	43	0.039
No	9	12	21	
Total	17	47	64	

Association between pharmacist's interventions with patient's belief

I can understand the language that is used by the pharmacist	I worry about the long-term side effects of my medicines?			p Value (Pearson Chi-square)
	Yes	No	Total	
Yes	46	16	62	0.022
No	0	2	2	
Total	46	18	64	

I can understand the language that is used by the pharmacist	I worry about becoming too dependent on my medicine?			p Value (Pearson Chi-square)
	Yes	No	Total	
Yes	48	14	62	0.013
No	0	2	2	
Total	48	16	64	

their health at present, depends on their medicines, whereas 17.2% ($n = 11$) did not believe that their health depends on the medicines. These showed that most of the patients are aware of the effect of medication in improving their health. About 87.5% ($n = 56$) beliefs that their medicines protected them from becoming worse, where the rest of 12.5% ($n = 8$) disbelief. Again, patient believes that medication is given to improve their condition to become better.

The third question in this domain questioned whether by having to take medicines, does it worries the subjects. About 45.3% ($n = 29$) answered yes and the rest answered no (54.7%, $n = 35$). About 71.9% claimed that they worried about the long-term side effects of their medicines ($n = 46$) and the rest seems unworried (28.1%, $n = 18$). The long-term side effects may contribute to the feeling of worried in this patient. Patient need to be explained on the side effects but should be advice on the benefit over risk ratio of the medication given. Patient was also worried of becoming too dependent. This is shown by 75.0% ($n = 48$) worried about becoming too dependent on the medicine unlike the 25.0% ($n = 16$) of the rest of the subjects.

Haslam et al. (2004) in their paper of Patients' experiences of medication for anxiety and depression: effects on working life stated that non-compliance was widespread due to side effects, lack of improvement in symptoms or because medication made patients feel worse. Patients did not feel well informed about their medication. People took less than the prescribed amount or stopped taking the medication. Concerns about dependency caused patients to ease medication prematurely.

The association between subjects' age scales with their belief. Three questions regarding their belief had been asked and they are 'My health, at present, depends on my medicines', 'I worry about the long-term side effects of my medicines' and 'I worry about becoming

too dependent on my medicine'. From the Tables 4 and 5, it is shown by a significant p value (Pearson chi-square) of 0.000, 0.030 and 0.049, respectively ($p < 0.050$) were obtained. Kelly et al. (2007) in her article of The Impact of Parents' medication Beliefs on Asthma Management suggested that there is a relationship between beliefs about medications and medication adherence.

The association between pharmacist's interventions with patient's knowledge, where there is an association: when the pharmacist explained to the patient the side effects of the drugs, patient can identify the type of tablet he or she is taking. This is shown as obtaining a significant p value (Pearson chi-square) of 0.015 ($p < 0.050$). There is a possible explanation, where patient may tend to identify the type of tablet they are taking when they have been told on the side effects of the drugs. When patient aware of what the drug is capable to react with their health, patient become more aware as to avoid the taking of wrong drug. Thus it is advisable for the pharmacist to start to counsel patient regarding the side effects during dispensing. Pharmacist intervention may effects the attitude of the patient towards medication. When patient is not receiving any wrong medication, they seem to follow the instruction if taking the medication as directed. The incidence of wrong dispensing should be reduced or avoided as to prevent form drug related problem.

Another aspects that may affect the attitude of patient to check the instruction before taking the medication is that they belief that the medicine protects them from becoming worse. The association showed a significant p value (Pearson chi-square) of 0.008. Those who believe that the medicine protects them from becoming worse tends to check the instruction before taking their medication.

There is a significant association between the beliefs or worrying of taking the

Table 5 Association between patient's knowledge and patient's attitude

Do you know the name of at least one of the medications that you have been taking?	You check the instructions before using any medication?			p Value (Pearson Chi-square)
	Yes	No	Total	
Yes	55	0	55	0.013
No	8	1	9	
Total	63	1	64	
I can identify the type of tablet I am taking	Do you ever forget to take your medication?			p Value (Pearson Chi-square)
	Yes	No	Total	
Yes	33	25	58	0.039
No	6	0	6	
Total	39	25	64	

Association between patient's belief and patient's attitude

My health, at present, depends on my medicines?	You check the instructions before using any medication?			p Value (Pearson Chi-square)
	Yes	No	Total	
Yes	53	0	53	0.027
No	10	1	11	
Total	63	1	64	
My health, at present, depends on my medicines?	If you feel worse when taking the medication, do you occasionally stop taking it?			p Value (Pearson Chi-square)
	Yes	No	Total	
Yes	26	27	53	0.011
No	10	1	11	
Total	36	28	64	

(continued)

Table 5 Association between patient's knowledge and patient's attitude (continued)

My medicines protect me from becoming worse?	You check the instructions before using any medication?			p Value (Pearson Chi-square)
	Yes	No	Total	
Yes	56	0	56	0.008
No	7	1	8	
Total	63	1	64	
Having to take medicines worries me?	Do you ever forget to take your medication?			p Value (Pearson Chi-square)
	Yes	No	Total	
Yes	22	7	29	0.026
No	17	18	35	
Total	39	25	64	
Having to take medicines worries me?	If you feel worse when taking the medication, do you occasionally stop taking it?			p Value (Pearson Chi-square)
	Yes	No	Total	
Yes	12	17	29	0.029
No	24	11	35	
Total	36	28	64	

medicine or forgetfulness to take their medicine and also stopping the medicine when they feel worse. This is proven by the significant p value (Pearson chi-square) of 0.026 and 0.029, respectively ($p < 0.05$).

Mona et al. (2000) in their study of Barriers to Asthma Care in Urban Children: Parent Perspectives had found out the most frequent types of barriers identified by parents were patient or family characteristics (43%), followed by environmental (28%), health care provider (18%) and healthcare system (11%). Parents were specifically concerned about the use, safety and long-term complications

of medications, the impact of limitation of exercise on their child's quality of life and their own quality of life. In contrast with the widespread beliefs that access to medical care, health insurance and continuity of care are the major barriers to quality asthma care, the barriers most frequently reported by parents were related to patient and family characteristics, health beliefs, or to their social and physical environment. To improve asthma management and health outcomes for urban, minority children with asthma, it is critical to tailor education about asthma and its treatment, and address quality of life issues for children and parents.

CONCLUSION

In conclusion, Pharmacist intervention and Patient's attitude towards their health management with the patient's level of knowledge and beliefs towards their medication has a significant effect on the pharmaceutical care to develop appropriate compliance.

The most important factor in improving and developing patient compliance is to identify all the factors that are contributing toward patient compliance and find ways to resolve it. The pharmacist should play a role in educating as well as improving the self-awareness and self-responsibility for each patient to be responsible in managing their disease. Patient's attitude shown that majority of the patient checked the instruction and follows directly the correct instruction before taking the medication, although, half of the patient claimed that they had at least an incidence of forgetting to take their medication. Majority of the patient did not stop taking their medication, but when they feel worse, majority stopped. The identification of medication is important for them to become aware of the name and able to identify the medication that they are taking. During dispensing, patient should be informed on the instructions on how to take the medication precisely and also other information which is consider relevant.

BIOGRAPHY

Wasif. S. Gillani Graduated from Pakistan during 2002-2006 and registered Pharmacist 2006. Higher degree attained from University Science Malaysia (USM) in academic year of 2007-2008. While during the research, area of interest was infectious diseases, epidemiological studies, drug abuse and addiction and antibiotics rational use and resistance. Currently working as a lecture within the school of Pharmacy.

In concern issues are the hospital management of antibiotics and resistance development studies. Secondly dealing with the nosocomial infections especially hospital acquired pneumonia (HAP) as in handling with the pharmaceutical care of the patients admitted in hospital.

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Nur Hafzan is a Malaysian local registered pharmacist; manage to get her M.Pharm degree from Universiti Sains Malaysia during academic session of 2008-2009. Currently working as lecturer in discipline of clinical pharmacy, school of pharmacy, Universiti Sains Malaysia. Her area of interest is on pharmaceutical care and therapeutic compliance among diabetic and other chronic illnesses.

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APPENDIX 1

Questionnaire form for the patient at out-patient department

Questionnaire: Medication Therapy Management by Improving Patient Compliance: It's Relationship to Patient Counseling, Disease Management and Pharmaceutical Care.

Seksyen A/Section A:

1. Jantina/Gender:

Lelaki/Male ☐ Perempuan/Female ☐

2. Umur/Age: _____ tahun/years

3. Bangsa:

Melayu/Malay ☐ Cina/Chinese ☐
India/Indian ☐ Lain/Others ☐

4. Taraf pendidikan tertinggi/highest educational level:

Tiada/None ☐ Sekolah Rendah/Primary School ☐

Sekolah Menengah/Secondary School ☐ Kolej/College ☐

Matrikulasi/Matriculation ☐ Universiti/University ☐

5. Pekerjaan/Employment status:

Tiada/Unemployed ☐ Pelajar/Student ☐
Swasta/Private

Kerajaan/Government ☐ Bekerja Sendiri/Self-employment ☐
Pesara/Retired ☐

6. Bahasa pertuturan di rumah/Language used at home:

Melayu/Malay ☐ Inggeris/English ☐
Cina/Chinese ☐ Tamil/Tamil ☐

7. Masalah kesihatan semasa/Current medical problems:

Penyakit Jantung/Cardiovascular disease ☐ Tekanan darah tinggi/Hypertension ☐

Kencing Manis/Diabetes Mellitus ☐ Asma/Asthma ☐

Lain/Others:

8. Sedang mengambil ubat/On medication:

Ya/Yes ☐ Tidak/No ☐

9. Adakah anda tahu nama sekurang-kurangnya satu daripada ubat-ubatan yang diambil?/Do you know the name of at least one of the medications that you have been taking?

Ya/Yes ☐ Tidak/No ☐

10. Adakah anda merokok/Do you smoke:

Ya/Yes ☐ Tidak/No ☐

Seksyen B/Section B:

1. Farmasi ialah tempat untuk di mana anda mengambil ubat sahaja/Pharmacy is the place where you can get medications only

Ya/Yes ☐ Tidak/No ☐

2. Ahli Farmasi ialah orang yang memberi ubat/Pharmacist is a person who gives out medicine:

Ya/Yes ☐ Tidak/No ☐

3. Saya boleh memahami bahasa yang digunakan oleh Ahli Farmasi/I can understand the language that is used by the pharmacist.

Ya/Yes ☐ Tidak/No ☐

4. Ahli Farmasi menerangkan kepada saya arahan bagaimana mengambil ubat saya/The pharmacist explained to me the instruction on how to take my medicine

Ya/Yes ☐ Tidak/No ☐

5. Saya akan mendapatkan maklumat mengenai ubat saya dari suratkhobar/I would check the information regarding my medication from the newspaper.
Ya/Yes ☐ Tidak/No ☐
 6. Saya akan menyemak ubat dahulu sebelum keluar dari Farmasi/I would check the medication first before leaving the Pharmacy.
Ya/Yes ☐ Tidak/No ☐
 7. Saya tidak pernah menerima sebarang ubat yang salah yang tidak dipreskrib oleh doctor saya/I never received any wrong medication not being prescribed by my physician.
Ya/Yes ☐ Tidak/No ☐
 8. Ahli Farmasi menerangkan kepada saya kesan sampingan mengenai ubat-ubatan saya/The Pharmacist explained to me on the side effects of the drugs.
Ya/Yes ☐ Tidak/No ☐
- Seksyen C/Section C:*
1. Adakah anda menerima maklumat/ pendidikan mengenai penyakit Darah Tinggi/Asma/Kencing Manis/Have you received any information/education about Hypertension/Asthma/Diabetes Mellitus?
Ya/Yes ☐ Tidak/No ☐
 2. Kesihatan saya, pada masa ini bergantung kepada ubat-ubatan saya/My health, at present, depends on my medicines?
Ya/Yes ☐ Tidak/No ☐
 3. Ubat-ubatan saya melindungi daripada penyakit saya menjadi lebih teruk/My medicines protect me from becoming worse?
Ya/Yes ☐ Tidak/No ☐
 4. Saya risau kerana perlu mengambil ubat/ Having to take medicines worries me?
Ya/Yes ☐ Tidak/No ☐
 5. Saya risau akan kesan sampingan jangka panjang ubat-ubatan saya/I worry about the long-term side effects of my medicines?
Ya/Yes ☐ Tidak/No ☐
 6. Saya risau saya akan terlalu bergantung kepada ubat-ubatan saya/I worry about becoming too dependent on my medicine?
Ya/Yes ☐ Tidak/No ☐
 7. Jika arahan yang diberi adalah: 1 biji 2 kali sehari, ia bermaksud ubat itu harus diambil selang 8 jam/If the given instruction were: 1 tablet 2 times a day, it means that tablets ought to be taken at 8 hr intervals?
Ya/Yes ☐ Tidak/No ☐
 8. Anda menyemak arahan sebelum mengambil sebarang ubat-ubatan/You check the instructions before using any medication?
Ya/Yes ☐ Tidak/No ☐
 9. Adakah anda pernah terlupa mengambil ubat-ubatan anda/Do you ever forget to take your medication?
Ya/Yes ☐ Tidak/No ☐
 10. Apabila anda berasa sihat, adakah anda berhenti mengambil ubat-ubatan anda pada waktu-waktu tertentu/When you feel better, do you stop taking your medication at times?
Ya/Yes ☐ Tidak/No ☐
 11. Anda akan berhenti mengambil ubatan jika ubat tersebut membuat anda merasa

makin tidak sihat/*If you feel worse when taking the medication, do you occasionally stop taking it?*

Ya/Yes ☐ Tidak/No ☐

12. Adakah anda pernah mengambil ubat tidak mengikut arahan/*do you ever take your medicines not as directed*

Ya/Yes ☐ Tidak/No ☐

13. Saya boleh mengenal pasti jenis ubat yang saya ambil/*I can identify the type of tablet I am taking*

Ya/Yes ☐ Tidak/No ☐

14. Saya ikut arahan yang betul yang diberikan oleh ahli farmasi semasa mengambil ubatan saya/*I follow the correct*

instructions given by the pharmacist while taking the medication

Ya/Yes ☐ Tidak/No ☐

15. Di mana anda menyimpan ubat di rumah/*Where do you keep your medication at home?*

Almari/Cupboard ☐ Peti Sejuk/Fridge ☐

Atas Meja/On table ☐ Dalam Beg/Inside Bag ☐

16. Lagi banyak saya mempunyai ilmu mengenai penyakit saya, lebih banyak saya dapat membantu diri saya/*The more I have knowledge about my disease, the more I can help myself.*

Ya/Yes ☐ Tidak/No ☐