Knowledge, Attitude and Practice Related to Unused Medicines Among Doctors, Pharmacists and Nurses: Developing and Validating a Tool

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Abstract

Introduction: The Medications Return Programme was introduced in Malaysia since 2010. The success of the programme depends in part on the knowledge about the programme, the attitude towards returning medicines to pharmacies, and the practice on unused medicines among healthcare providers.

Objective: This study aimed to develop scales to measure the knowledge about medications return programme, attitude towards returning medicines to pharmacy and practice on unused medicines, and assess the reliability and validity of these scales among doctors, pharmacists and nurses in Hospital Queen Elizabeth, Hospital Queen Elizabeth II, Hospital Wanita dan Kanak-Kanak Sabah and Hospital Mesra Bukit Padang.

Methods: Respondents were asked to self-administer the questionnaire twice on two occasions that were four to ten days apart. Items homogeneity was assessed by item-partial total correlation and Cronbach's alpha coefficient. Test-retest reliability was assessed by intraclass correlation coefficient (ICC). The construct validity of the knowledge scale was assessed by extreme groups comparison whereas that of attitude and practice scales was assessed by exploratory factor analysis.

Results: A total of 140 respondents comprising doctors, nurses, and pharmacists were included into the study. Alpha coefficients for knowledge, attitude, and modified practice scales were 0.264, 0.948, and 0.784 respectively. Test-retest reliabilities for the three scales were 0.59, 0.67, and 0.83 in the same order. In both attitude and modified practice scale, there was only one factor with eigen value more than one, and all items loaded highly only on that one factor. .

Conclusion: All the three scales have good psychometric properties on the population studied. Both knowledge and attitude scales consisted eight items whereas there were five items in the practice scale.

Keywords: medications return, unused medicines, attitude, knowledge, practice

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Introduction

Studies have shown that the use of medicines is increasing globally (1,2). Many of the medicines, however, remain unused and accumulated at home due to factors such as the non-optimal prescribing and dispensing practices, patient nonadherence, improvement in treated conditions, medication discontinuation, changes in treatment, medication expiration and patient deaths (3,4). Problems occur when these medicines were not stored and disposed properly as it can lead to accidental ingestions and poisonings, misuse, or abuse of the medicines (3-5). Besides that, improper disposal of medicines has also raised concerns among the environmentalists. The practice of pouring medicines down the sink or flushing them down the toilet can lead to the leakage of pharmaceuticals into landfills and waterways. Studies have found pharmaceutical traces in wastewater and drinking water, but little is known about the implications on human health and ecosystems in the long run (6).

Unused medicines return programmes have been implemented in various countries to overcome the problems. In the United States for example, prescription drug take back activities are held from time to

time by the government and community pharmacies to collect unused and unwanted medicines from patients as well as to educate them on safe medication disposal practice (5,7). In Canada, unused and expired medicines can be returned to any pharmacy in the country any day of the year (8). In Taiwan, medication disposal boxes are set up in many hospitals and community pharmacies to encourage the proper disposal of medicines (9).

In 2010, the Medications Return Programme was introduced by Pharmaceutical Services Programme, Ministry of Health Malaysia to encourage patients to return unused medicines to the pharmacies. The introduction of the programme reflected the growing concerns on the consequences of unused, unwanted, or expired medicines on public health. The main purposes of the programme were to protect the patients from the indiscriminate use of medicines and to properly dispose unused and expired medicines. To ensure a nationwide implementation of the programme, the Medications Return Programme Guideline was published and the programme was implemented in all pharmacies in the government hospitals and health clinics (10).

The successful implementation of the programme depends in part on the knowledge about the programme, the attitude towards returning medicines to pharmacy, and the practice on unused medicines among the caregivers, especially the healthcare professionals. However, to our best knowledge, there were no published validated tools to measure these concepts in this population at the time of the study. The Return and Disposal of Unused Medications (ReDiUM) tool, albeit measuring similar concepts, was not yet available at the time this study was conducted (11). Therefore, this study was conducted with the objectives to develop scales to measure the knowledge about medications return programme, attitude towards returning medicines to pharmacy and practice on unused medicines, and to assess the reliability and validity of these scales among doctors, pharmacists, and nurses in public hospitals.

Methods

Development of tool

The tool was developed by the study team, which included three pharmacists from Hospital Queen Elizabeth and Hospital Queen Elizabeth II, together with two other pharmacists from the same hospitals. The two non-study team pharmacists were selected based on their familiarity with the Medications Return Programme. First, a draft questionnaire was prepared by the study team (Appendix I). The first draft consisted of a general question (Q1), eight questions on knowledge about the Medications Return Programme (Q2-Q9), nine questions on attitude towards the programme (Q10-Q18), and eight questions on practice about unused medicines (Q19-Q26). The choice of items was based on published studies about unused medicines (3-9).

Second, the draft was discussed in multiple sessions of group discussions between the study team and the two non-study team pharmacists. At this stage, item Q18 was excluded. Consensus was reached that all the remaining items were relevant to the study objectives and at face value measure what they are purported to measure. The second draft was then created, with the addition of instructions for respondents and four questions on demographics: sex, age, profession, and years in service (Appendix II).

Third, the second draft was pre-tested on two doctors and a nurse. The pretest was carried out to ensure that the questions were comprehensible to the target respondents. Pharmacists were excluded from the pretest as they were already part of the members who devised the items. The second draft was then accepted as the final questionnaire.

Lastly, the scoring rules for each scale were decided (12). The score for the knowledge scale was the percentage of correct answers. The scores for attitude and practice scales were the total score divided by the maximum possible score times one hundred. All scales scores thus range from 0 to 100, with higher score indicating higher or better position on the corresponding concepts. The scores for each scale was considered as continuous measures, and it was not within the scope of this study to categorise the score into distinct categories.

Participants and settings

Doctors, nurses and pharmacists from four tertiary hospitals in Kota Kinabalu, Sabah, Malaysia were surveyed. The respondents were asked to self-administer the questionnaire twice on two occasions that were 4 to 10 days apart between April to July 2018. The hospitals involved were Hospital Queen Elizabeth, Hospital Queen Elizabeth II, Hospital Wanita Dan Kanak-Kanak Sabah and Hospital Mesra Bukit Padang. The respondents in each profession-hospital stratum was selected by convenience sampling. The eligible

participants were individually approached by the data collectors and those who consented to participate were recruited. The study was approved by the Ministry of Health Medical Research and Ethics Committee (MREC) with the reference number NMRR-16-2791-32502 (IIR).

Sample size

Pre-study sample sizes were estimated as follows: The knowledge scale construct was planned to be assessed by extreme groups comparison. To detect a standardised effect size of 0.8 between any pair at 0.80 power and 0.05 alpha level, at least 25 respondents were needed in each group. Sample size formula: sample size per group equals to 16 divided by squared standardised effect size (13). The attitude and practice scales constructs were planned to be assessed by exploratory factor analysis. Based on a rule-of-thumb of at least 5 respondents per item, the sample size needed was at least 40.

Data analysis

Data were analysed using Stata/SE 15.1 (StataCorp LLC, College Station, TX, USA). The frequency of endorsement was described by the proportion of respondents who chose each response alternative to an item. Homogeneity of the items in each scale was assessed by Cronbach's alpha and item-partial total correlation coefficients. Test-retest reliability of each scale score was assessed by intraclass correlation coefficient (ICC). In general, the acceptable value for Cronbach's alpha is at least 0.70 (12). Meanwhile, the ICC value can be interpreted as follows: 0.00 to 0.40 poor to fair; 0.41 to 0.60 moderate; 0.61 to 0.80 substantial; 0.80 to 1.00 almost perfect (12). The choice of interval length for test-retest of 4 to 10 days was based on a previous study (14).

The construct validity of the knowledge scale was assessed by pairwise comparisons of the mean scores between doctors, nurses, and pharmacists. The 95% confidence interval of the mean differences were adjusted by Tukey multiple comparison procedure. The inclusion of doctors and nurses in the study, in addition to pharmacists, was to allow the assessment of construct validity by extreme groups comparison (12). It was postulated before the study that pharmacists would have the best knowledge about the programme. The postulation was based on the fact that the programme was introduced by the Pharmaceutical Services Programme itself (10) and it was previously reported that the pharmacist was the main source for information regarding the storage of medications (15).

The construct validity for the attitude and practice scales was assessed by exploratory factor analysis, using principal factor method. It was postulated before the study that all items would load highly (factor loading ≥ 0.4) on one factor only for both scales. All score estimations were made at 95% confidence level.

Results

One hundred and forty respondents that comprised 52 doctors, 42 nurses, and 46 pharmacists were included into the study. The characteristics of the respondents were shown in Table 1. Table 2 showed the frequency of endorsement for each item in the three scales. There were many response alternatives with proportion less than 0.2 or more than 0.8 which were not desirable but not critical.

Table 1: Demographics of respondents (*n*=140)

Variable	*n* (%)	Median (IQR)	Mean (SD)	95% CI
Age (years)		29.5 (5.0)		
Gender				
Male	35 (25.0)			
Female	105 (75.0)			
Profession				
Doctor	52 (37.1)			
Nurse	42 (30.0)			
Pharmacist	46 (32.9)			
Age by profession (years)				
Doctor		29.0 (3.5)		
Nurse		29.0 (9.0)		
Pharmacist		30.0 (4.0)		
Number of years in service				

Doctor	3.5 (3.5)		
Nurse	5.6 (5.8)		
Pharmacist	5.0 (5.3)		
Ever heard about the program?			
Yes	125 (89.0)		83.0, 94.0
No	15 (11.0)		-
Knowledge score (%)		74.1 (15.0)	71.4, 76.8
Attitude score (%)		87.7 (15.7)	85.1, 90.4
Practice score (%)		67.7 (18.1)	64.7, 70.8

Abbreviation: IQR = inter-quartile range, SD = standard deviation, CI = confidence interval

Table 2: Frequency (%) of endorsement for each item

Knowledge about Medications Return Programme* scale

Item	True	False	Don't Know
Q2	106 (84.0)	0 (0.0)	19 (15.2)
Q3	30 (24.2)	39 (31.5)	55 (44.3)
Q4	122 (97.6)	1 (0.8)	2 (1.6)
Q5	118 (94.4)	3 (2.4)	4 (3.2)
Q6	108 (86.4)	4 (3.2)	13 (10.4)
Q7	16 (12.8)	94 (75.2)	15 (12.0)
Q8	58 (46.4)	50 (40.0)	17 (13.6)
Q9	11 (8.9)	104 (83.9)	9 (7.3)

Attitude towards the return of medicines to the pharmacy scale

Item	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Q10	4 (2.9)	6 (4.4)	5 (3.7)	54 (39.4)	68 (49.6)
Q11	4 (2.9)	4 (2.9)	8 (5.7)	58 (41.4)	66 (47.1)
Q12	4 (2.9)	3 (2.1)	3 (2.1)	45 (32.1)	85 (60.7)
Q13	4 (2.9)	3 (2.1)	1 (0.7)	48 (34.3)	84 (60.0)
Q14	4 (2.9)	8 (5.7)	2 (1.4)	31 (22.1)	95 (67.9)
Q15	5 (3.6)	3 (2.1)	6 (4.3)	38 (27.1)	88 (62.9)
Q16	3 (2.1)	1 (0.7)	24 (17.1)	38 (27.1)	74 (52.9)
Q17	3 (2.1)	3 (2.1)	5 (3.6)	41 (29.3)	88 (62.9)

Practice on unused medicines scale

Item	Never	Sometimes	Frequently	Always
Q19	10 (7.1)	39 (27.9)	40 (28.6)	51 (36.4)
Q20	26 (18.6)	65 (46.4)	27 (19.3)	22 (15.7)
Q21	16 (11.5)	60 (43.2)	33 (23.7)	30 (21.6)
Q22	13 (9.3)	35 (25.0)	47 (33.6)	45 (32.1)
Q23	21 (15.1)	35 (25.2)	29 (20.9)	54 (38.9)
Q24	123 (87.9)	15 (10.7)	2 (1.4)	0 (0.0)
Q25	129 (92.8)	9 (6.5)	1 (0.7)	0 (0.0)
Q26	65 (46.4)	53 (37.9)	15 (10.7)	7 (5.0)

* Among respondents who reported ever heard of the Medications Return Programme (n=125).

Table 3 showed that the items in the Knowledge scale were not homogenous as shown by the low (less than 0.2) item-partial total correlation for all items except for two and very low coefficient alpha, 0.264. The test-retest reliability was borderline acceptable with ICC=0.59. Meanwhile, the items in the Attitude scale were homogenous with very high coefficient alpha, 0.948. The test-retest reliability was acceptable with ICC=0.67. As for the Practice scale, its psychometric properties were improved with the removal of item Q24, Q25, and Q26. The coefficient alpha and ICC for the modified Practice scale were 0.784 and 0.83, respectively.

Table 3: Item-partial total correlation and coefficient alpha if item removed

Knowledge about Medication Programme* scale			
Item	*n*	Item-partial total correlation	Alpha if item removed
Q2	125	0.20	0.178
Q3	124	0.15	0.200
Q4	125	0.04	0.265
Q5	125	0.12	0.237
Q6	125	-0.05	0.322
Q7	125	0.25	0.125
Q8	125	0.07	0.270
Q9	124	0.04	0.275
Scale alpha=0.264, Test-retest intraclass correlation=0.59			
Attitude towards returning medicines to pharmacy scale			
Item	*n*	Item-partial total correlation	Alpha if item removed
Q10	137	0.790	0.942
Q11	140	0.815	0.941
Q12	140	0.880	0.936
Q13	140	0.899	0.935
Q14	140	0.674	0.951
Q15	140	0.789	0.942
Q16	140	0.762	0.944
Q17	140	0.888	0.936
Scale alpha=0.948, Test-retest intraclass correlation=0.67			
Practice on unused medicines scale			
Item	*n*	Item-partial total correlation	Alpha if item removed
Q19	140	0.471	0.691
Q20	140	0.542	0.674
Q21	139	0.549	0.673
Q22	140	0.544	0.674
Q23	139	0.611	0.655
Q24	140	0.080	0.745
Q25	139	0.142	0.740
Q26	140	0.279	0.730
Scale alpha=0.730, Test-retest intraclass correlation=0.85			
Modified practice on unused medicines scale			
Item	*n*	Item-partial total correlation	Alpha if item removed
Q19	140	0.544	0.749
Q20	140	0.534	0.752
Q21	139	0.592	0.734
Q22	140	0.579	0.737
Q23	139	0.550	0.746
Scale alpha=0.784, Test-retest intraclass correlation=0.83			

* Among respondents who reported ever heard of the Medications Return Programme (n=125).

Table 4 showed that the pharmacists scored significantly higher than both nurses and doctors in terms of knowledge about the Medications Return Programme. There was no significant difference between the nurses and doctors.

Table 4: Pairwise comparison of knowledge scores between doctors, nurses and pharmacists

	Mean difference	95% confidence interval [a]
Nurse vs Doctor	-4.8	-11.8, 2.1
Pharmacist vs Doctor	13.5	6.9, 20.2
Pharmacist vs Nurse	18.4	11.6, 25.1

Looking at both attitude and practice scales, Table 5 showed that only one factor had eigen value more than 1 and all items loaded highly on that one factor only, which indicated that there was only one important construct for each scale.

Table 5: Factor analysis

Attitude towards returning medicines to pharmacy scale

Factor	Eigen value
Factor 1	5.683
Factor 2	0.227
Factor 3	0.159
Factor 4	0.076
Factor 5	-0.016
Factor 6	-0.051
Factor 7	-0.097
Factor 8	-0.116

Item	Factor 1	Factor 2	Factor 3	Factor 4	Uniqueness
Q10	0.8176	-0.2247	0.0100	0.1295	0.2643
Q11	0.8399	-0.2304	0.0486	0.0731	0.2338
Q12	0.9164	-0.1141	-0.1272	-0.1439	0.1103
Q13	0.9327	-0.0037	-0.1801	-0.0887	0.0898
Q14	0.7026	0.2407	-0.1552	0.1353	0.4060
Q15	0.8123	0.0870	0.1685	0.0047	0.3041
Q16	0.7863	0.0733	0.2348	-0.0822	0.3144
Q17	0.9100	0.1988	0.0254	0.0145	0.1315

Modified Practice on Unused Medicines Scale

Factor	Eigen value
Factor 1	2.025
Factor 2	0.069
Factor 3	-0.043
Factor 4	-0.103
Factor 5	-0.244

Item	Factor1	Factor2	Uniqueness
Q19	0.6096	-0.0267	0.6277
Q20	0.6122	0.1767	0.5940
Q21	0.6689	0.0836	0.5455
Q22	0.6588	-0.1578	0.5410
Q23	0.6299	-0.0696	0.5984

Discussion

More than ten years have elapsed since the introduction of the Medications Return Programme, our study showed that some healthcare professionals were still unaware of the programme. The low awareness was even more prevalent among the patients. According to a survey among outpatients in Sabah, only 54% knew about the programme (16). It was previously discussed that more publicity was needed to increase the programme uptake among the patients or the public (11,16). This could be materialised only if healthcare professionals have good knowledge about the programme and they themselves adopt proper practices on unused or unwanted medicines. The argument was supported by a finding that showed that

of the people who received advice on disposal practices from a well-informed healthcare professional, 75% disposed of their medicine appropriately (2). The tools from this study, if validated, would allow for the quantification of the three attributes studied namely knowledge about the Medications Return Programme, attitude towards returning medicines to pharmacy, and practice on unused medicines among healthcare professionals and thus provide insight on the matter.

To our knowledge, this was the first study to develop tools to measure knowledge, attitude, and practice about the Medications Return Programme among healthcare providers. A closely related tool, the Return and Disposal of Unused Medications (ReDiUM) tool, which measures similar concepts was available but with a different target group which was the public (11). Barring the knowledge domain, the items in ReDiUM revolved around similar themes to that of this study. The shared themes were the impact of improper medicines disposal on the environment, patient or individual safety issues, wastage of resources, and the proper ways to dispose unused medicines. Meanwhile, the main focus of the knowledge domain in ReDiUM was on how to properly dispose unused medicines, whereas the knowledge scale in this study was emphasising on healthcare providers' knowledge about the Medications Return Programme itself.

The low level of homogeneity among the items in the Knowledge scale was not a reason to dismiss the scale. To be technically precise, it should be called Knowledge index instead of Knowledge scale. The difference between the two terms is that the former comprises items that are not related to each other, in that a person who knows the answer to one item might not know the answer for another item, in contrary to the latter where a person who scores high on one item should also score high on other items. For example, a nurse who never worked in an inpatient ward would not be expected to know with certainty the answer for items Q8 and Q9. To borrow the terms from structural equation modelling (SEM), an index comprises causal indicators (the arrows point to the construct from the items) whereas a scale comprises effect indicators (the arrows point from the construct to the items) (12). Homogeneity is thus not a concern for an index. If the index can differentiate between those who were expected to have high knowledge and those who were expected to have low knowledge, its construct is established. It appears that our Knowledge scale was able to differentiate between pharmacists and the others as evidenced by the significant differences between them. The proposed theory that pharmacists have the best knowledge was well supported by the study results. As for the borderline acceptable ICC, it was postulated that it might be due to learning effect whereby some respondents might have looked up the information about the programme after the first occasion.

The Attitude scale had a very high level of items homogeneity as well as acceptable ICC of at least 0.6 (12). In fact, some of the items might be redundant as shown by very high item-partial total correlation (more than 0.8), which is the correlation between an item score and the total score excluding that item. The exploratory factor analysis supported the pre-study postulation that the items were the reflections of one concept only, which was the attitude towards returning medicines to pharmacy.

Meanwhile, the Practice scale's initial psychometric properties had called for modification. It appeared that items Q24, Q25, and Q26 were different from the rest as evidenced from the low item-partial total correlations. Their removal had improved the scale's internal consistency considerably and all the remaining items loaded highly on one factor only as expected before the study. It was postulated that the three items were more reflective of patients' practices and the rest were more reflective of healthcare providers' practices. As evidenced in Table 1, four out of the five remaining items in the Practice scale started with the phrase "I advised my patients".

In examining both the Attitude and Practice constructs, the original solutions were not rotated because they agreed well with the pre-study expectation and intended way of interpretation. It should be stressed that the principal factor method was used in the factor analysis instead of the traditional principal-component factor method. The reason was that the later method assumed that uniqueness is zero (17). Uniqueness is the percentage of variance for an item that is not explained by the common factors and 1 minus uniqueness is called communality. High uniqueness indicates that the item is not well explained by the factors. The results showed that the uniqueness for the items in Practice scale were quite high which suggested the need to modify the existing items or add new items to the scale. Even though some of the items had proportion of endorsement less than 0.2 or more than 0.8, their deleterious effects on the psychometric properties of both scales were offset by the high average item-partial total correlations (12).

This study had several limitations. The generalisation of all the estimations made in this study to a larger population of doctors, nurses, and pharmacists may not be warranted statistically as the sampling

was not random and was limited to public tertiary hospitals in Kota Kinabalu. The lack of differentiation between inpatient and outpatient staff might have affected the study validity, but the extent to which was unknown. It was suggested that future studies should employ probability sampling if estimation of the scores was the main objective. Nevertheless, the results of this study could aid in estimating the sample size for future studies. The real value of this study, however, was in providing empirical evidence about the reliability and validity of the three concepts studied. Still, it must be cautioned that validity and reliability of a score are dynamic in that they may be different in different populations. A confirmatory factor analysis must be performed before the scales can be recommended for use in practice.

Conclusion

The final tool developed consisted three measuring scales, with eight items in the knowledge about medications return programme scale, eight items in the attitude towards returning medicines to pharmacy scale and five items in the practice on unused medicines scale. All three scales were reliable and valid empirically on the population studied. The validity and reliability of the tool must be further studied before it can be widely used.

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Conflict of interest statement

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Appendix I

SECTION A (*General item)*

Please tick* |_/_| *ONE box only.

1.	I have heard about “Program Pemulangan Ubat” before.	|__| Yes---1 |__| No---2

SECTION B (*Knowledge about Medications Return Program*)

Please tick* |_/_| *ONE box only.

2.	“Program Pemulangan Ubat” is a nationwide program.	|__| True---1 |__| False---2 |__| Don’t know---3
3.	“Program Pemulangan Ubat” involves both private and government pharmacies.	|__| True---1 |__| False---2 |__| Don’t know---3
4.	“Program Pemulangan Ubat” is a service provided by the pharmacy counter.	|__| True---1 |__| False---2 |__| Don’t know---3
5.	Through “Program Pemulangan Ubat”, the patients can return their unused medicines to the pharmacy counter by themselves.	|__| True---1 |__| False---2 |__| Don’t know---3
6.	Through “Program Pemulangan Ubat”, the patients can return their unused medicines to the pharmacy counter via the nurses.	|__| True---1 |__| False---2 |__| Don’t know---3
7.	Through “Program Pemulangan Ubat”, the patients can return their unused medicines to the pharmacy counter via their doctors.	|__| True---1 |__| False---2 |__| Don’t know---3
8.	Through “Program Pemulangan Ubat”, the patients can return their unused medicines to the pharmacy counter via their relatives.	|__| True---1 |__| False---2 |__| Don’t know---3

9. "Program Pemulangan Ubat" is only for outpatients. |__| True---1
|__| False---2
|__| Don't know---3

****

Q2, Q4, Q5, Q6, Q7, Q8: Recode into "1" if answer "True", "0" if otherwise

Q3, Q9: Recode into "1" if answer "False", "0" if otherwise

Compute K_Score = (Q2+Q3+Q4+Q5+Q6+Q7+Q8+Q9)/8*100

Higher K_score is better knowledge.

SECTION C (*Attitude (perceptual, behavioural and cognitive) towards Medication Returns Program*)

Do you agree with the following statements? Please circle ① ONE number only.

(1=Strongly disagree, 2=Disagree, 3=No opinion, 4=Agree, 5=Strongly agree)

	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
"Program Pemulangan Ubat" can encourage the patients to return the unused medicines.	1	2	3	4	5
"Program Pemulangan Ubat" can prevent medication errors by the patients.	1	2	3	4	5
"Program Pemulangan Ubat" can ensure patients' safety.	1	2	3	4	5
"Program Pemulangan Ubat" can prevent misuse of medicines.	1	2	3	4	5
"Program Pemulangan Ubat" can prevent abuse of medicines.	1	2	3	4	5
"Program Pemulangan Ubat" can reduce wastage of medicines.	1	2	3	4	5
"Program Pemulangan Ubat" can ensure proper medicines disposal.	1	2	3	4	5
"Program Pemulangan Ubat" can protect the environment.	1	2	3	4	5
"Program Pemulangan Ubat" is a valuable service.	1	2	3	4	5

****

Compute A_score=(Q10+Q11+Q12+Q13+Q14+Q15+Q16+Q17+Q18)/45*100

Higher A_score is more positive attitude.

SECTION D (*Practice about unused medicines*)

Please read the following statements and choose the answer that reflects you the most. Please circle ① ONE number only.

(1=Never, 2=Sometimes, 3=Frequently, 4=Always)

	Never	Sometimes	Frequently	Always
19. I advised my patients to return the unused medicines to the pharmacy.	1	2	3	4
20. I advised my patients about proper medicines disposal.	1	2	3	4
21. I advised my patients about the risk of keeping unused medicines at home.	1	2	3	4
22. I advised my patients about the possible wastage of unused medicines at home.	1	2	3	4
23. I returned any unused medicines to the pharmacy.	1	2	3	4
24. I disposed any unused medicines in the sink.	1	2	3	4
25. I disposed any unused medicines in the toilet.	1	2	3	4
26. I disposed any unused medicines in the trash bin.	1	2	3	4

****

Recode Q24 INTO q24, Q25 INTO q25, Q26 INTO q26: 1=4; 2=3; 3=2; 4=1

Compute P_score=(Q19+Q20+Q21+Q22+Q23+q24+q25+q26)/32*100

Higher P_score is better practice.

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Appendix II

SECTION A (General item)

BAHAGIAN A (Item umum)

Please tick |_/_| ONE box only.

Sila tandakan |_/_| SATU kotak sahaja.

1.	I have heard about "*Program Pemulangan Ubat*" before. *(Saya pernah dengar tentang Program Pemulangan Ubat sebelum ini.)*	|__| Yes---1 |__| No---2

If you checked the "**No"** box, **skip section B** and proceed to section C, D and E.

Jika anda menanda kotak ***"No"****, **langkau bahagian B** dan terus ke bahagian C, D and E.*

SECTION B (Knowledge about Medications Return Program)

BAHAGIAN B (Pengetahuan tentang Program Pemulangan Ubat)

Please tick |_/_| ONE box only.

Sila tanda |_/_| SATU kotak sahaja.

2.	"*Program Pemulangan Ubat*" is a nationwide program. *(Program Pemulangan Ubat ialah program seluruh negara.)*	|__| True---1 |__| False---2 |__| Don't know---3
3.	"*Program Pemulangan Ubat*" involves both private and government pharmacies. *(Program Pemulangan Ubat melibatkan kedua-dua farmasi kerajaan dan swasta.)*	|__| True---1 |__| False---2 |__| Don't know---3
4.	"*Program Pemulangan Ubat*" is a service provided by the pharmacy. *(Program Pemulangan Ubat ialah satu perkhidmatan yang disediakan oleh farmasi.)*	|__| True---1 |__| False---2 |__| Don't know---3
5.	Through "*Program Pemulangan Ubat*", a patient can return her unused medicines to the pharmacy counter by herself. *(Melalui Program Pemulangan Ubat, seseorang pesakit boleh memulangkan ubat yang tidak digunakan lagi ke kaunter farmasi dengan sendiri.)*	|__| True---1 |__| False---2 |__| Don't know---3
6.	Through "*Program Pemulangan Ubat*", a nurse can return a patient's unused medicines to the pharmacy counter. *(Melalui Program Pemulangan Ubat, seseorang jururawat boleh memulangkan ubat yang tidak digunakan lagi oleh pesakit ke kaunter farmasi.)*	|__| True---1 |__| False---2 |__| Don't know---3

7. Expired medicines will not be accepted when returned to pharmacy under "*Program Pemulangan Ubat*". *(Ubat yang telah luput tarikh tidak akan diterima apabila dipulangkan ke farmasi di bawah Program Pemulangan Ubat.)*	|__| True---1 |__| False---2 |__| Don't know---3
8. Under "*Program Pemulangan Ubat*", it is compulsory for an inpatient to return his unused medicines that he brought from home to the clinical pharmacist or nurse in the ward. *(Di bawah Program Pemulangan Ubat, seseorang pesakit dalam diwajibkan untuk memulangkan ubatnya yang dibawa dari rumah yang tidak digunakan lagi kepada pegawai farmasi klinikal atau jururawat di dalam wad.)*	|__| True---1 |__| False---2 |__| Don't know---3
9. "*Program Pemulangan Ubat*" is only for outpatients. *(Program Pemulangan Ubat hanyalah untuk pesakit luar sahaja.)*	|__| True---1 |__| False---2 |__| Don't know---3

SECTION C (Attitude towards the return of medicines to the pharmacy)

BAHAGIAN C (Sikap terhadap pemulangan ubat ke farmasi)

Do you agree with the following statements? Please circle ① ONE number only.

Adakah anda bersetuju dengan pernyataan berikut? Sila bulatkan ① SATU nombor sahaja.

(1=Strongly disagree, 2=Disagree, 3=No opinion, 4=Agree, 5=Strongly agree)

(1=Sangat tidak setuju, 2=Tidak setuju, 3=Tiada pendapat, 4=Setuju, 5=Sangat setuju)

	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
10. Returning unused medicines to the pharmacy can prevent medication errors by the patients. *Pemulangan ubat yang tidak digunakan lagi ke farmasi dapat menghalang kesilapan pengubatan oleh pesakit-pesakit.*	1	2	3	4	5
11. Returning unused medicines to the pharmacy can ensure patients' safety. *Pemulangan ubat yang tidak digunakan lagi ke farmasi dapat menjamin keselamatan pesakit-pesakit.*	1	2	3	4	5
12. Returning unused medicines to the pharmacy can prevent misuse of medicines. *Pemulangan ubat yang tidak digunakan lagi ke farmasi dapat menghalang penggunaan ubat yang salah.*	1	2	3	4	5
13. Returning unused medicines to the pharmacy can prevent abuse of medicines. *Pemulangan ubat yang tidak digunakan lagi ke farmasi dapat menghalang penyalahgunaan ubat.*	1	2	3	4	5

14. Returning unused medicines to the pharmacy can reduce wastage of medicines. *Pemulangan ubat yang tidak digunakan lagi ke farmasi dapat mengurangkan pembaziran ubat.*	1	2	3	4	5
15. Returning unused medicines to the pharmacy can ensure proper medicines disposal. *Pemulangan ubat yang tidak digunakan lagi ke farmasi dapat menjamin pelupusan ubat yang sesuai.*	1	2	3	4	5
16. Returning unused medicines to the pharmacy can protect the environment. *Pemulangan ubat yang tidak digunakan lagi ke farmasi dapat melindungi alam sekitar.*	1	2	3	4	5
17. Returning unused medicines to the pharmacy is a good practice. *Pemulangan ubat yang tidak digunakan lagi ke farmasi adalah amalan yang baik.*	1	2	3	4	5

SECTION D (Practice about unused medicines)

BAHAGIAN D (Amalan berkaitan ubat yang tidak digunakan lagi)

Please read the following statements and choose the answer that reflects you the most. Please circle ① ONE number only.

Sila baca pernyataan-pernyataan berikut dan pilih jawapan yang paling mencerminkan diri anda. Sila bulatkan ① SATU nombor sahaja.

(1=Never, 2=Sometimes, 3=Frequently, 4=Always)

(1=Tidak pernah, 2=Kadang-kadang, 3=Kerap, 4=Sentiasa)

	Never	Sometimes	Frequently	Always
19. I advised my patients to return the unused medicines to the pharmacy. *Saya nasihatkan pesakit-pesakit saya untuk memulangkan ubat yang tidak digunakan lagi ke farmasi.*	1	2	3	4
20. I advised my patients about proper medicines disposal. *Saya nasihatkan pesakit-pesakit saya tentang pelupusan ubat yang sesuai.*	1	2	3	4
21. I advised my patients about the risk of keeping unused medicines at home. *Saya nasihatkan pesakit-pesakit saya tentang risiko menyimpan ubat yang tidak digunakan lagi di rumah.*	1	2	3	4
22. I advised my patients about the possible wastage of unused medicines at home. *Saya nasihatkan pesakit-pesakit saya tentang kemungkinan pembaziran ubat yang tidak digunakan lagi di rumah.*	1	2	3	4

23. I returned any unused medicines to the pharmacy. *Saya memulangkan apa-apa sahaja ubat yang tidak digunakan lagi ke farmasi.*	1	2	3	4
24. I disposed any unused medicines in the sink. *Saya membuang apa-apa sahaja ubat yang tidak digunakan lagi ke dalam sinki.*	1	2	3	4
25. I disposed any unused medicines in the toilet. *Saya membuang apa-apa sahaja ubat yang tidak digunakan lagi ke dalam tandas.*	1	2	3	4
26. I disposed any unused medicines in the trash bin. *Saya membuang apa-apa sahaja ubat yang tidak digunakan lagi ke dalam tong sampah.*	1	2	3	4

SECTION E (Demography)

BAHAGIAN E (Demografi)

Please tick |_/_| ONE box only or write in the box where appropriate.

Sila tanda |_/_| SATU kotak sahaja atau tulis di dalam kotak yang mana sesuai.

1. Sex
   (Jantina)
   |__| Male---1
   |__| Female---2

2. Age
   (Umur)
   |__||__|year

3. Profession
   (Pekerjaan)
   |__| Doctor---1
   |__| Nurse---2
   |__| Pharmacist---3

4. Years of service (government)
   (Tahun dalam perkhidmatan (kerajaan))
   |__||__|year |__||__|month

----------*TERIMA KASIH*----------

PARTICIPANT ID: |__||__||__

SCORING RULES FOR ANALYSIS:

Knowledge about Medications Return Program (Q2 to Q9)

Q2, Q4, Q5, Q6: Recode into “1” if answer “True”, “0” if otherwise

Q3, Q7, Q8, Q9: Recode into “1” if answer “False”, “0” if otherwise

Compute K_Score = (Q2+Q3+Q4+Q5+Q6+Q7+Q8+Q9)/8*100

Higher K_score is better knowledge.

Attitude towards the return of medicines to the pharmacy (Q10 to Q17)

For each question: score 1 if the answer is Strongly disagree, score 2 if the answer is Disagree, score 3 if the answer is No opinion, score 4 if the answer is Agree and score 5 if the answer is Strongly agree.

Compute A_score=(Q10+Q11+Q12+Q13+Q14+Q15+Q16+Q17)/40*100

Higher A_score is more positive attitude.

Practice about unused medicines (Q19 to Q26)

For each question: score 1 if the answer is Never, score 2 if the answer is Sometimes, score 3 if the answer is Frequently and score 4 if the answer is Always.

Rename Q24 INTO q24, Q25 INTO q25, Q26 INTO q26 and recode the scores as follows: 1=4; 2=3; 3=2; 4=1

Compute P_score=(Q19+Q20+Q21+Q22+Q23+q24+q25+q26)/32*100

Higher P_score is better practice.