Information on antibiotics in an Indonesian hospital outpatient setting: What is provided by pharmacy staff and recalled by patients?

Melani NAURITA, Yosi I. WIBOWO, Adjai P. SETIADI, Eko SETIAWAN, Steven V. HALIM, Bruce SUnderland.

Abstract
Background: The provision of information by pharmacy staff is a key factor to ensure patients’ understanding and quality use of medications, including antibiotics. However, little is known regarding the transmission of information between pharmacy staff and patients in Indonesia.

Objective: This study aimed to identify information on antibiotics provided by pharmacy staff and recalled by patients in an Indonesian outpatient setting.

Methods: The study was conducted in a hospital outpatient clinic in Malang, Indonesia, in 2019. A checklist was used to obtain the data on information provided by pharmacy staff, while interviews were conducted to determine information recalled by patients (only presenting patients were included); a total of 15 information items – i.e. 14 essential and one secondary – were observed. Descriptive analysis was used to summarise data on the checklists (‘given’ versus ‘not given’) as well as responses from the interviews (‘recalled’ versus ‘missed’).

Results: Eleven pharmacy staff (two pharmacists and nine pharmacy technicians) were involved in providing information for patients obtaining oral antibiotics during the study period. Of 14 essential information items, only about half was given by pharmacy staff, with pharmacists significantly providing more information than pharmacy technicians (7.96 versus 7.67 respectively; p<0.001). The most frequently information items provided (>90%) included “antibiotic identification”, “indication”, administration directions (i.e. “dosage”, “frequency”, “hour of administration”, “administration before/after meal”, “route of administration”), and “duration of use”. A total of 230 patients consented to the study, giving 79.9% response rate. The average number of information items recalled by patients was 7.09 (SD 1.45). Almost all patients could recall information on administration directions [i.e. “route of administration” (97.0%), “frequency” (95.2%), “dosage” (92.6%), “hour of administration” (85.7%), “administration before/after meal” (89.1%)] and “duration of use” (90.9%). Fewer patients were able to recall “antibiotic identification” (76.5%) and “indication” (77.0%).

Conclusions: Pharmacy staff provided antibiotic information in a limited fashion, while patients showed adequate ability to recall the information given to them. Further study is needed to better understand the effective process of information transmission between pharmacy staff and patients, especially if more information was provided, to better optimise the use of antibiotics in outpatient settings in Indonesia.

Keywords
Consumer Health Information; Anti-Bacterial Agents; Pharmacists; Pharmacy Technicians; Professional Practice; Pharmacy Service, Hospital; Outpatient Clinics, Hospital; Cross-Sectional Studies; Indonesia

INTRODUCTION
Patient adherence has an important role in optimising the effectiveness of treatment and minimising adverse events. In order for patients to adhere to their treatment, they must have a good understanding toward their medications. Several studies have reported a low level of understanding by patients regarding medications they have received. Thus, the provision of comprehensive information – including, but not limited to, medication name and indication, directions for use, side effects, precautions, contraindication, storage, and drug interactions – would be important in optimising patients’ use of medications.

Health professionals, particularly physicians and pharmacists, are regarded as trusted sources of patient information on medications. Consequently, adequate information provision, both written and verbal, must occur at each patient encounter. It should be noted that the process of information provision has been conceptualised mainly as an action of transmission between health practitioners and patients. In addition to the information given by health practitioners, it is important to understand how patients have received the information. It has been hypothesised that patients’ understanding of information and moreover their ability to recall it are important
The provision of medication information should not solely rely on physicians; some studies have reported that most patients were unable to precisely recall all the information given during their visits.\textsuperscript{14,15} Hence, pharmacists have the potential role in providing necessary information while dispensing patients’ medications. Based on the pharmacy literature, the provision of medication information can be categorised as the process of counselling or as a part of counselling; regardless of the terminology used, however, medication information provided by pharmacists has resulted in positive patient outcomes.\textsuperscript{12,16,17} A systematic review by Okumura et al. (2014), which included 101 randomised controlled trials, reported that pharmacist-led medication information services resulted in statistically significant improved patient outcomes, including knowledge, adherence, clinical outcome, and quality of life (p < 0.05).\textsuperscript{18}

Antibiotics are among the most commonly used medications globally.\textsuperscript{19} It has been estimated that antibiotic consumption in outpatient settings is far greater than in inpatient settings.\textsuperscript{20} Hospital outpatient clinics are one of the outpatient settings with high antibiotic prescription rates.\textsuperscript{21,22} Hence, it is important to develop strategies to reduce the negative impacts of improper antibiotic use, especially antibiotic side effects and resistance, in outpatient settings.\textsuperscript{23} A study of 553 patients receiving antibiotic prescriptions in outpatient settings in The Netherlands reported that 31% of the patients were not given any information regarding the antibiotics prescribed; of those given information, only 37% indicated that they received information on how to use their antibiotics.\textsuperscript{24} Unsurprisingly, poor understanding by patients, being linked with low adherence to antibiotic treatments have been reported.\textsuperscript{25,26}

In Indonesia, antibiotics have been one of the most frequently prescribed medications, and problems with adherence in outpatient settings have been well documented.\textsuperscript{27–30} While patients’ understanding of information is one of the key factors to adherence, little is known regarding the transmission of information related to antibiotics between pharmacy staff and patients in outpatient settings. This lack of data hampers the development of appropriate strategies for effective transmission of antibiotic information to improve patients’ understanding and quality use of antibiotics. Considering the widespread use of antibiotics in Indonesia, failure to optimise the provision of antibiotic information – including that in the outpatient settings – has the potential to increase the risk of improper use of antibiotics which further promotes antibiotic resistance.\textsuperscript{31,32} Hence, this study aimed to identify the information provided by pharmacy staff and the information subsequently recalled by patients receiving antibiotic treatment in an Indonesian hospital outpatient setting.

**METHODS**

**Research setting**

This study was conducted at an outpatient clinic of a private hospital in Malang, Indonesia. Malang is the second largest city in the province of East Java, with a population of approximately 861,000. There are 21 hospitals operating in the city – 18 of which are privately owned.\textsuperscript{33} The private hospital used for this study has 16 specialty care services and seven sub-specialty care services. The inpatient care units in the hospital accommodate 185 beds with a bed occupancy rate (BOR) of 75%. With the implementation of national health coverage [Jaminan Kesehatan Nasional, JKN] by the Indonesian Government since 2014, hospital outpatient clinics have become one of the main referral centres for patients unable to be adequately treated in the primary care facilities.\textsuperscript{34} This study hospital outpatient clinic had an average monthly attendance of 17,839 patients; of which, an average of 554 patients were prescribed antibiotics.

The process of medication dispensing in this outpatient clinic starts with patients submitting the prescription at the pharmacy counter, followed by conducting prescription screening, preparing medications (including labelling medication containers), checking, and providing the dispensed medications to patients. The outpatient clinic also provided delivery services. This study received ethical approval from the Research Ethics Committee of Universitas Surabaya (082/KE/VII/2019), and an official permit from the hospital director (RSIA/0539/III.6.AU/F/V/2019).

**Study design and participant recruitment**

This study involved pharmacy staff and patients obtaining oral antibiotics from the study setting. The observations were conducted between July and September 2019. Patients prescribed oral antibiotics and collecting them themselves during the study observation days were included, while those receiving antibiotic prescriptions for tuberculosis or using the hospital’s delivery services were excluded as they received different interventions. Patients meeting the inclusion criteria were given information relating to the study. If they agreed to participate, they were asked to give written informed consent. Sample size was calculated by considering the population size of 554 (i.e. monthly average number of patients prescribed antibiotics), using 95% confidence interval and 5% margin of error, thus giving a sample size of 228 patients.\textsuperscript{35,36}

The pharmacy staff included in this study were those in charge of handing out the dispensed antibiotics to patients consenting to participate. There were 15 pharmacy staff in this study setting, comprising of two pharmacists and 13 pharmacy technicians. Based on the practice standards, pharmacists have the responsibility to supply prescribed medications; while pharmacy technicians could provide assistance under pharmacist supervision.\textsuperscript{36,37} Pharmacy Technicians in Indonesia hold educational qualifications and are not just trained in the workplace. All pharmacy staff received prior explanation about this study, and were asked for written consent if they agreed to participate. However, they were not informed when the data collection would take place. The data collectors were pharmacy technician interns who were already assigned to this study setting before the data collection took place, thus observation bias (Hawthorne effect) was expected to be minimal.\textsuperscript{38}
Research instrument

A checklist was used to obtain data on information given by the pharmacy staff. The information items listed in the checklist were drafted from literature, and validated with two drug information pharmacists in Universitas Surabaya. The validation process resulted in minor adjustments to the checklist, including: “name of antibiotic” was referred to “antibiotic identification”; “directions for use” was specified to “frequency (number administered per day)”; “time of administration” was divided into two items, i.e. “hour of administration” and “administration before/after meal”; and “dosage” was defined as “dosage (quantity taken at each administration)”. The information items were classified into essential (14 items) and secondary (1 item, i.e. “disposal” as it is only applied for dry syrup antibiotics, considering the possibility of residuals). The final checklist can be seen in Table 1. The checklist was used to document information verbally given by pharmacy staff, as well as information on the label attached to the medication containers.

To obtain data on patients’ recall of information, an interview guide was developed to assess patients’ ability to recall information provided by the pharmacy staff. The first question in the guide was: “Of the medications you have received, could you identify which ones are antibiotics?”. If patients failed to identify the antibiotics, the data collectors would pick the antibiotics for the patients. Then, patients were asked to answer questions about each information item previously provided by the pharmacy staff. The interview guide was validated by two patients, and only minor language revisions were required.

Data collection

The data collection was conducted with the help of eight data collectors, i.e. pharmacy technician interns in this study setting. Two training sessions were given prior to the data collection. The first session consisted of providing information relating to the process of medication dispensing in the outpatient clinic, types of antibiotics available, research objectives, data collection procedure, and technical guidelines to complete the checklist which was followed by a simulation. The second session aimed to explain and simulate the interview guide. The simulation was followed by feedback from the principal researcher, and only those who were able to correctly complete the checklist and conduct the interviews were allowed to start collecting data.

The data collection was done during the clinic’s busiest days (Tuesday-Thursday) and hours (9 to 11 am and 6 to 8 pm) between July to September 2019; patients were conveniently selected based on their accessibility, and the recruitment was stopped when a minimum sample size of 228 patients was reached. The pharmacy counter staff receiving prescriptions were in charge of selecting prescriptions which meet the inclusion criteria; this was to ensure that the pharmacy staff were approached for information recall. The data collection was done during the clinic’s busiest days (Tuesday-Thursday) and hours (9 to 11 am and 6 to 8 pm) between July to September 2019; patients were conveniently selected based on their accessibility, and the recruitment was stopped when a minimum sample size of 228 patients was reached. The pharmacy counter staff receiving prescriptions were in charge of selecting prescriptions which meet the inclusion criteria; this was to ensure that the pharmacy staff were approached for information recall.

Table 1. Checklist of antibiotic information items

| No | Information items                              | Recommendation from literature | Final Checklist |
|----|------------------------------------------------|--------------------------------|----------------|
|    |                                               | MoH-RI<sup>10</sup> | PIONAS<sup>10</sup> | ASHP<sup>10</sup> |   |
| 1  | Drug name (antibiotic identification)          | ✓                             | ✓               | ✓               | ✓ |
| 2  | Indication                                    | ✓                             | ✓               | ✓               | ✓ |
| 3  | Dosage (quantity taken at each administration)| ✓                             | ✓               | ✓               | ✓ |
| 4 & 5 | Time of administration (hour of administration, and administration before/after meal) | ✓ | ✓ | ✓ | ✓ |
| 6  | Directions for use (frequency - number of administration per day) | ✓ | ✓ | ✓ | ✓ |
| 7  | Route of administration                       | ✓                             | ✓               | ✓               | ✓ |
| 8  | Duration of use                               | ✓                             | ✓               | ✓               | ✓ |
| 9  | Drug-food interaction                         | ✓                             | ✓               | ✓               | ✓ |
| 10 | Potential side effects                        | ✓                             | ✓               | ✓               | ✓ |
| 11 | Actions taken when side effects occur         | ✓                             | ✓               | ✓               | ✓ |
| 12 | Storage                                       | ✓                             | ✓               | ✓               | ✓ |
| 13 | Actions taken when missing/omitting a dose    | ✓                             | ✓               | ✓               | ✓ |
| 14 | Disposal                                      | ✓                             | ✓               | ✓               | ✓ |

MoH-RI= Ministry of Health Republic Indonesia; PIONAS= Pusat Informasi Obat Nasional (National Medicine Information Centre); ASHP= American Society of Health-System Pharmacists.

Table 2. Characteristics of pharmacy staff providing information

| Characteristics | Pharmacist (n=2) | n (%) |
|-----------------|-----------------|-------|
| Gender          |                 |       |
| Male            | 2 (100.00)      | 0 (0.00) |
| Female          |                 |       |
| Age; years, mean (SD) | 24.50 (0.71) |       |
| Work experience; years, mean (SD) | 2.00 (0.00) |       |
| Pharmacy technician (n=9) |                 |       |
| Gender          |                 |       |
| Male            | 2 (22.22)       | 7 (77.78) |
| Female          |                 |       |
| Age; years, mean (SD) | 30.11 (7.10) |       |
| Work experience; years, mean (SD) | 9.78 (7.81) |       |

<sup>1</sup>Diploma in Pharmacy qualification
Table 3. Information given by pharmacy staff

| Information items; n (%) | Total (N= 230) | Pharmacist (n= 142) | Pharmacy technician (n= 88) | p-value† |
|--------------------------|---------------|---------------------|-----------------------------|---------|
| Antibiotic identification⁴ | Written (label) | 184 (80.0) | 122 (85.9) | 62 (70.5) | 0.004* |
|                          | Verbal | 207 (90.0) | 136 (95.8) | 71 (80.7) | <0.001* |
|                          | Combined (written and/or verbal) | 211 (91.7) | 138 (97.2) | 73 (83.0) | <0.001* |
| Indication               | Written (label) | 90 (39.1) | 61 (43.0) | 29 (33.0) | 0.132 |
|                          | Verbal | 222 (96.5) | 140 (98.6) | 82 (93.2) | 0.030* |
|                          | Combined (written and/or verbal) | 226 (98.3) | 142 (100.0) | 84 (95.5) | 0.011* |
| Route of administration  | Written (label) | 229 (99.6) | 142 (100.0) | 87 (98.9) | 0.204 |
|                          | Verbal | 220 (95.7) | 142 (100.0) | 78 (88.6) | <0.001* |
|                          | Combined (written and/or verbal) | 229 (99.6) | 142 (100.0) | 87 (98.9) | 0.204 |
| Frequency (number of administration per day) | Written (label) | 230 (100.0) | 142 (100.0) | 88 (100.0) | 1.000 |
|                          | Verbal | 220 (95.7) | 142 (100.0) | 88 (86.6) | <0.001* |
|                          | Combined (written and/or verbal) | 230 (100.0) | 142 (100.0) | 88 (100.0) | 1.000 |
| Dosage (each administration) | Written (label) | 230 (100.0) | 142 (100.0) | 88 (100.0) | 1.000 |
|                          | Verbal | 220 (95.7) | 142 (100.0) | 88 (88.6) | <0.001* |
|                          | Combined (written and/or verbal) | 230 (100.0) | 142 (100.0) | 88 (100.0) | 1.000 |
| Time (hour) of administration | Written (label) | 229 (99.6) | 142 (100.0) | 87 (98.9) | 0.204 |
|                          | Verbal | 199 (86.5) | 137 (96.0) | 62 (70.5) | <0.001* |
|                          | Combined (written and/or verbal) | 229 (99.6) | 142 (100.0) | 87 (98.9) | 0.204 |
| Time of administration (before/after meal) | Written (label) | 221 (96.1) | 137 (96.5) | 84 (95.5) | 0.698 |
|                          | Verbal | 186 (80.9) | 119 (83.8) | 67 (76.1) | 0.152 |
|                          | Combined (written and/or verbal) | 221 (96.1) | 137 (96.5) | 84 (95.5) | 0.698 |
| Duration of drug use      | Written on e-ticket | 217 (94.3) | 142 (100.0) | 75 (85.2) | <0.001* |
|                          | Verbal | 219 (95.2) | 139 (97.9) | 80 (90.9) | 0.016* |
|                          | Combined (written and/or verbal) | 225 (97.8) | 142 (100.0) | 83 (94.3) | 0.004* |
| Actions taken when missing/omitting a dose | Written (label) | 2 (0.9) | 0 (0.0) | 2 (2.3) | 0.072 |
|                          | Verbal | 3 (1.3) | 2 (1.4) | 1 (1.1) | 0.860 |
|                          | Combined (written and/or verbal) | 3 (1.3) | 2 (1.4) | 1 (1.1) | 0.860 |
| Drug-drug interaction     | Written (label) | 0 (0.0) | 0 (0.0) | 0 (0.0) | N/A |
|                          | Verbal | 0 (0.0) | 0 (0.0) | 0 (0.0) | N/A |
|                          | Combined (written and/or verbal) | 0 (0.0) | 0 (0.0) | 0 (0.0) | N/A |
| Drug-food interaction     | Written (label) | 0 (0.0) | 0 (0.0) | 0 (0.0) | N/A |
|                          | Verbal | 0 (0.0) | 0 (0.0) | 0 (0.0) | N/A |
|                          | Combined (written and/or verbal) | 0 (0.0) | 0 (0.0) | 0 (0.0) | N/A |
| Potential side effects    | Written (label) | 0 (0.0) | 0 (0.0) | 0 (0.0) | N/A |
|                          | Verbal | 0 (0.0) | 0 (0.0) | 0 (0.0) | N/A |
|                          | Mixed (e-ticket and/or verbal) | 0 (0.0) | 0 (0.0) | 0 (0.0) | N/A |
| Actions taken when side effects occur | Written (label) | 0 (0.0) | 0 (0.0) | 0 (0.0) | N/A |
|                          | Verbal | 2 (0.9) | 2 (1.4) | 0 (0.0) | 1.000 |
|                          | Combined (written and/or verbal) | 2 (0.9) | 2 (1.4) | 0 (0.0) | 0.265 |
| Storage                  | Written (label) | 0 (0.0) | 0 (0.0) | 0 (0.0) | N/A |
|                          | Verbal | 0 (0.0) | 0 (0.0) | 0 (0.0) | N/A |
|                          | Combined (written and/or verbal) | 0 (0.0) | 0 (0.0) | 0 (0.0) | N/A |
| Number of information items given | | | | | |
| Mean (SD)                | 7.85 (5.52) | 7.96 (3.95) | 7.67 (6.67) | <0.001* |
| Range (possible range 0-14) | 5-10 | 7-10 | 5-9 | |

N/A= not applicable; *p-value from Kruskal-Wallis tests; †p-value significant; ⁴Indicating which medications are antibiotics

Before providing dispensed medications, it is the hospital procedure to check whether the person present is the patient or a representative; only the patients themselves were included in this study. The data collectors would approach the patients according to their convenient accessibility, and observe the information given by the pharmacy staff when handing out the dispensed antibiotics; this included verbal information as well as written information on the label attached to the medication container. The provision of verbal or written information was documented in the checklist which was marked as ‘given’ or ‘not given’. Upon completion of information provision by the pharmacy staff, patients were approached...
RESULTS

In total, 11 pharmacy staff – including two pharmacists and nine pharmacy technicians – were involved in providing information for patients when obtaining oral antibiotics within the study period. Pharmacists had worked in this setting for two years on average, while pharmacy technicians had a longer work experience of 10 years on average; most of the pharmacy staff were female. The characteristics of the pharmacy staff giving the information can be seen in Table 2.

In general, almost all pharmacy staff provided essential information – either verbal or written – on which medications were antibiotics (“antibiotic identification”), “indication”, administration directions (including: “dosage”, “frequency”, “hour of administration” and “administration before/after meal”, and “route of administration”), as well as “duration of use”. Meanwhile, information regarding “action taken when missing/omitting a dose”, “drug-drug interaction”, “drug-food interaction”, “storage”, “side effects”, and “action taken when side effects occur” were rarely communicated to patients. Of the 62 patients receiving dry syrup antibiotics, none was given secondary information on “disposal”. Details of the essential information given by pharmacy staff, either verbal or written, are presented in Table 3.

Pharmacists in this study significantly provided more verbal or written information regarding “antibiotic identification”, “indication”, and “duration of use” compared to pharmacy technicians (all p-values <0.011). In addition, pharmacists provided more verbal information on “antibiotic identification”, “indication”, administration directions (including: “route of administration”, “dosage”, “frequency”, and “hour of administration”), as well as “duration of use” (all p-values <0.001). The average number of information items given by pharmacists was significantly higher than pharmacy technicians (7.96 versus 7.67, respectively; p<0.001).

A total of 288 patients were approached during the study period; of those, 230 patients consented to the study, thus giving a response rate of 79.9%. Meanwhile, 58 patients refused to participate mainly due to lack of time or having other prior appointments. Of the 230 participating patients, approximately 60% were females, and graduated from senior high school (30.9%) or had a bachelor degree (24.3%). Of the total, 142 patients received information from pharmacists and 88 patients received information by the data collectors and again were checked if they themselves were the patients; only the patients themselves would be included in which they were explained about the study aims and were asked to participate. If they agreed to participate, they were asked to provide written informed consent and were interviewed to assess their ability to recall the information. At the beginning of the interview, patients were asked to identify which of their medications were antibiotics; if they failed to choose the correct ones, the data collectors would pick the antibiotics for them. Patients were then asked about each information item previously provided by the pharmacy staff; during the process, patients could see the label if they wished to read it (but the data collectors could not direct them to do so). The interview process was documented in which the information items correctly recalled by patients would be categorised as ’recalled’, while items not reported or misreported by patients were treated as ’missed’. Initially the interview process was planned to be audiotaped, but this was considered not feasible due to the loud background noise while patients were unwilling to move to a private counselling area.

Data analysis

Data analysis was conducted descriptively and presented in the form of percentages or mean and standard deviation (SD). Differences between groups were tested using T-test or Kruskall-Wallis sign-ranked test (if the data were not normally distributed) for interval/ordinal data, and chi-square test was used for nominal data. Data on information given by pharmacy staff was analysed by determining the frequency and percentage of pharmacy staff who either provided or did not provide each of the information items (‘given’ versus ‘not given’); these analyses were done for verbal and written information separately, as well as for the combination of verbal and written information. The number of information items given by each pharmacy staff member was calculated, and the mean (SD) was determined for the total pharmacy staff. For data on patient information recall, frequency and percentage of patients who ‘recalled’ versus ‘missed’ for each information item was calculated. The number of information items recalled by patients was analysed for each patient, and mean (SD) was determined for the total patients. The data analysis process was assisted with the use of Statistical Package for the Social Science (SPSS) software version 23 (IBM Corp., Armonk, NY, USA).

Table 4. Characteristics of participating patients

| Characteristics | Total (N=230) | Patient provided information by pharmacist (n=142) | Pharmacy technician (n=88) | p-value * |
|-----------------|--------------|---------------------------------------------|--------------------------|----------|
| **Gender; n (%)** |              |                                            |                          |          |
| Male            | 85 (37.0)    | 51 (35.9)                                  | 34 (38.6)                | 0.678    |
| Female          | 145 (63.0)   | 91 (64.1)                                  | 54 (61.4)                |          |
| **Age; years, mean (SD)** | 42.33 (15.36) | 42.22 (14.95) | 42.51 (16.08) | 0.916    |
| **Education; n (%)** |            |                                            |                          |          |
| Elementary school | 19 (8.3)   | 12 (8.5)                                   | 7 (8.0)                  | 0.393    |
| Junior high school | 22 (9.6)   | 13 (9.2)                                   | 9 (10.0)                 |          |
| Senior high school | 71 (30.9) | 42 (29.6)                                  | 29 (33.3)                |          |
| D1 (1-year associate degree) | 18 (7.8) | 10 (7.0)                                  | 8 (9.1)                  |          |
| D3 (3-year associate degree) | 41 (17.8) | 25 (17.6)                                  | 16 (18.2)                |          |
| Bachelor degree | 56 (24.3)   | 37 (26.1)                                  | 19 (21.6)                |          |
| Master degree   | 3 (1.3)     | 3 (2.1)                                    | 0 (0.0)                  |          |

D= diploma:  *p*-value from Kruskall-Wallis test (for interval or ordinal data) or chi-square test (for gender)
The profile of patients in the outpatient setting: What is provided by pharmacists or from pharmacy technicians. Details on patient characteristics can be seen in Table 4.

From the essential information provided, almost all patients could recall the information items relating to administration directions [including: “route of administration” (97%), “frequency” (95.2%), “dosage” (92.6%), “hour of administration” (85.7%), and “administration before/after meal” (89.1%)] as well as “duration of use” (90.9%). Fewer patients are able to recall “antibiotic identification” (76.5%) or “indication” (77%).

The average items of information recalled by patients was 7.09 (SD 1.45), with significantly higher recall of information provided by pharmacists compared to that provided by technicians (p<0.001). The profile of patient information recalled is detailed in Table 5.

**DISCUSSION**

This study has examined the quality of antibiotic information given by pharmacy staff and level of recall by patients in an Indonesian outpatient setting. In general, pharmacy staff have provided limited essential information which mainly related to antibiotic identification, indication, and administration directions. From the information given,
however, patients showed an adequate ability to recall that information. This study findings might indicate that pharmacy staff – as the last healthcare personnel interacting with patients before they use their medications – provide an essential role in optimising the process of information transmission in order to ensure patients’ understanding towards their use of antibiotics.\textsuperscript{36,37}

Of the 230 patient encounters in this study, information was provided most frequently by pharmacists (n=142). Pharmacists also generally provided more of the defined essential information compared to pharmacy technicians, particularly verbal information. It should be acknowledged that verbal communication is required to complement written information; previous studies have reported that some patients preferred verbal counselling, and there were individuals who have had difficulty understanding the information written on the medication label.\textsuperscript{41-43} Other studies conducted in the USA have indicated that approximately 50% of patients misunderstood one of more instructions listed on the medication label; types of information often misunderstood by patients were frequency and dosage.\textsuperscript{41,42} The common causes for misunderstanding included label language – poor word recognition (for example: tablespoon versus teaspoon) or using language not in normal usage (for example: administered orally), and complexity of instructions.\textsuperscript{42} Similarly, a study in Indonesia reported that failure to understand written information regarding route of administration, frequency, dosage, and time of administration have been one of the contributing factors to the inappropriate use of antibiotics.\textsuperscript{44} It should be noted that the effectiveness of antibiotics is partially determined by the appropriateness of the route of administration, frequency, dosage, and time of administration.

Secondly, pharmacists in this study were found to provide more written or verbal information items regarding “antibiotic identification”, “indication”, and “duration of use”. It is important to counsel patients on which of their medications are antibiotics and what are the indications, since antibiotics have different characteristics compared to other drug classifications, such as medications for chronic diseases. One such characteristic is related to “duration of use”, which was mentioned less frequently by pharmacy technicians in this study. Antibiotics should be taken according to the recommended duration (finishing ‘a course’), which is different from some symptomatic medications which are only administered when the symptoms occur.\textsuperscript{7} The better performance by pharmacists in providing antibiotic information in this study might be because the Indonesian competence standards for pharmacists are focusing more on the professional skills, while the standards for pharmacy technicians concentrate more on the technical skills of dispensing.\textsuperscript{46} This is also supported with the introduction of standards of pharmacy practice in hospitals as well as in community pharmacies in 2016 by the Indonesian Government; the standards clearly state that it is a pharmacists’ responsibility to dispense prescription medications and to provide appropriate information to ensure quality use of medications.\textsuperscript{36,37} Findings in this study, therefore, suggest that pharmacists are expected to do more counselling rather than pharmacy technicians, thus optimising patients’ understanding and appropriate use of medications.

Of the essential information given by the pharmacy staff, participating patients generally performed adequately in recalling information on route of administration (97%), frequency (95.2%), dosage (92.6%), duration of use (90.9%), and time of administration (hour of administration, 85.7%, and administration before/after meal, 89.1%). This is potentially because information pertaining to administration directions is directly related to the technical aspects on how patients use their medications. Fewer patients were able to recall “antibiotic identification” (76.5%) and “indication” (77%). This is in parallel with the fact that less written information was given with regards to “antibiotic identification”, particularly by pharmacy technicians. It should be noted that antibiotics have specific directions for use to optimise its effectiveness, hence, written information can be used to help patients to identify which of their medications are antibiotics.\textsuperscript{45} Similarly, with information on “indication”, only approximately 40% of pharmacists or pharmacy technicians provided written information (they tended to provide the information verbally). It should be noted that the Indonesian standards for medication labels are limited to patients’ name and individual administration directions with the addition of general information, such as date of dispensing and the pharmacy details.\textsuperscript{37} Thus, the use of written information (such as included on the attached label on the medication container) with regard to antibiotic identification and indication should be encouraged. The FIP Working Group for Labelling has recommended the inclusion of generic names (product names), in addition to administration directions, as the minimum information for labels of prescribed medicines.\textsuperscript{48} Whenever necessary, the use of ancillary labels can be considered to provide specific information, such as antibiotic indication. Ancillary labels have been used in the UK and Australia, and have been reported to conveniently and effectively reinforce pharmacists’ verbal consultations in providing information on the correct use of medications.\textsuperscript{48,49}

About half of the defined essential information items were not communicated by pharmacists or pharmacy technicians, either verbally or written on the label; this included: drug interactions, side effects, storage, and disposal (for dry syrup). In line with a study by Koster et al. (2015) in outpatients pharmacies in Netherlands, information relating to storage and disposal was never provided to patients.\textsuperscript{50} Meanwhile, information on side effects and interactions were communicated only to a small proportion of patients (22% and 4%, respectively).\textsuperscript{50} It should be acknowledged that patient needs for information relating to side effects and drug interactions have been relatively high, especially during first prescription encounters.\textsuperscript{8,11,52} One study has suggested that the low rates of information provision relating to side effects and interactions might be due the pharmacy staff concerns that patients might fear to take their medications and thus hamper their adherence.\textsuperscript{43} Therefore, the provision of comprehensive information - which is also includes interactions, side effects, storage, and disposal - warrants special attention, particularly with regard to when and how the information should be provided.
This study has some limitations. Firstly, this study was conducted during clinic’s specific operating times, when they were busier, so that the results should be generalised with caution. However, a response rate of 80% (of the patients approached) or 51% (of the total patients prescribed antibiotics and presented in the clinic) was achieved, thus suggesting that this study should provide adequate insight regarding the information transmission process in this outpatient setting. Secondly, there was a risk of observation bias (Hawthorne effect) while observing the information provision by the pharmacy staff. The data collectors, however, were pharmacy technician interns who were already assigned to the study setting (covert approach), thus it was expected that the pharmacy staff could maintain their normal behaviour since they would consider interns were observing for their own learning. In addition, pharmacy staff were asked for their consent at the beginning of the study while they were not informed when the actual observation might take place. Finally, data on patients' recall of information was collected directly after the information was provided; hence, it does not provide data on patients' ability to retain the information over a longer period of time. However, antibiotics are generally taken for a short period of time, thus issues with information retention might be minimal.

CONCLUSIONS
This study has provided a preliminary mapping of antibiotic information transmission between pharmacy staff and patients in an Indonesian hospital outpatient setting. While pharmacy staff tended to provide information to a limited extent, patients generally showed an adequate ability to recall the information provided. Further research is required to explore the process of information transmission and the contributing factors, such as patient interaction, pharmacist professionalism, time allocation, and pharmacy internal factors. This should provide a basis for developing appropriate interventions and defining the scope of information to be provided, to facilitate an effective information transmission, thus improving patients’ understanding and quality use of antibiotics in Indonesia.

CONFLICT OF INTEREST
Authors declared none.

FUNDING
This study was carried out with financial aid from the Ministry of Research, Technology and Higher Education of the Republic of Indonesia through the Master’s Thesis Research Grant of 2020 (034/SP-Lit/LPPM-01/RistekBRIN/Mono/FF/III/2020).

AUTHOR ROLES (CRediT)
Conceptualization: YIW, APS, BS.
Data curation: ES, SVH.
Formal analysis: MN, SVH.
Funding acquisition: YIW, APS.
Investigation: MN.
Methodology: YIW, ES.
Supervision: YIW.
Validation: APS, BS.
Writing – original draft: MN.
Writing – review & editing: MN, YIW, APS, ES, SVH, BS.

References
1. Conn VS, Ruppar TM, Enriquez M, Cooper PS. Patient-Centered Outcomes of Medication Adherence Interventions: Systematic Review and Meta-Analysis. Value Health. 2016;19(2):277-285. https://doi.org/10.1016/j.jval.2015.12.001
2. Gillespie D, Hood K, Farewell D, et al. Adherence-adjusted estimates of benefits and harms from treatment with amoxicillin for LRTI: secondary analysis of a 12-country randomised placebo-controlled trial using randomisation-based efficacy estimators. BMJ Open. 2015;5(3):e006160. https://doi.org/10.1136/bmjopen-2014-006160
3. Reading SR, Go AS, Fang MC, et al. Health Literacy and Awareness of Atrial Fibrillation. J Am Heart Assoc. 2017;6(4):e005128. https://doi.org/10.1161/jaha.116.005128
4. de Vries ST, Keens JC, Visser R, et al. Medication beliefs, treatment complexity, and non-adherence to different drug classes in patients with type 2 diabetes. J Psychosom Res. 2014;76(2):134-138. https://doi.org/10.1016/j.jpsychores.2013.11.003
5. Ameh D, Wallymahmed A, Mackenzie G. Patient knowledge of their dispensed drugs in rural Gambia. Int J Sci: Basic Appl Res. 2014;16(2):61-85.
6. Umira S. Assessment of patient’s knowledge regarding dispensed medication in a South Indian Government Hospital. Intl J Pharm Pharm Sci. 2015;7(2):544-547.
7. Tran VD, Dorofeeva VV, Loskutova EE. Development and validation of a scale to measure the quality of patient medication counseling using Rasch model. Pharm Pract (Granada). 2018;16(4):1327. https://doi.org/10.18549/pharmpract.2018.04.1327
8. Kusch MK, Haefeli WE, Seidling HM. How to meet patients’ individual needs for drug information - a scoping review. Patient Prefer Adherence. 2018;12:2339-2355. https://doi.org/10.2147/ppy.a173651
9. Opare-Addo MN, Busenberg KO, Marfo AF, et al. Source of medicines and medicine information by self-reported persons living with hypertension and diabetes in rural and urban Ghana. Pharm Pract (Granada). 2018;16(3):1151. https://doi.org/10.18549/pharmpract.2018.03.1151
10. Tarn DM, Paterniti DA, Wenger NS, Williams BR, Chewning BA. Older patient, physician and pharmacist perspectives about community pharmacists’ roles. Int J Pharm Pract. 2012;20(5):285-293. https://doi.org/10.1111/j.2042-7174.2012.00202.x
11. Shah B, Chewning B. Conceptualizing and measuring pharmacist-patient communication: a review of published studies. Res Social Adm Pharm. 2006;2(2):153-185. https://doi.org/10.1016/j.sapharm.2006.05.001
12. Linn AJ, van Dijk L, Smit EG, Jansen J, van Weert JC. May you never forget what is worth remembering: the relation between recall of medical information and medication adherence in patients with inflammatory bowel disease. J Crohns Colitis. 2013;7(11):e543-e550. https://doi.org/10.1016/j.crohns.2013.04.001

13. Kessels RP. Patients’ memory for medical information. J R Soc Med. 2003;96(5):219-222. https://doi.org/10.1258/jrms.96.5.219

14. Roshi D, Burazeri G, Schröder-Bäck P, et al. Understanding of Medication Information in Primary Health Care: A Cross-Sectional Study in a South Eastern European Population. Front Public Health. 2020;8:386. https://doi.org/10.3389/fpubh.2020.00386

15. Jenkins V, Solis-Trapala I, Langridge C, Catt S, Talbot DC, Fallowfield LJ. What oncologists believe they said and what patients believe they heard: an analysis of phase I trial discussions. J Clin Oncol. 2011;29(1):61-68. https://doi.org/10.1200/jco.2010.30.0814

16. ASHP guidelines on pharmacist-conducted patient education and counseling. Am J Health Syst Pharm. 1997;54(4):431-434. https://doi.org/10.1093/ajhp/54.4.431

17. American Society of Consultant Pharmacists. Guidelines for pharmacist counseling of geriatric patients. Available at: http://www.ascp.com (accessed Apr 11, 2020).

18. Okumura LM, Rotta I, Correr CJ. Assessment of pharmacist-led patient counseling in randomized controlled trials: a systematic review. Int J Clin Pharm. 2014;36(5):882-891. https://doi.org/10.1007/s11096-014-9982-1

19. World Health Organisation (WHO). WHO report on surveillance of antibiotic consumption. 2018-2018 early implementation. https://apps.who.intiris/bitstream/handle/10665/277359/9789241514880-eng.pdf?ua=1 (accessed Aug 7, 2020).

20. Duffy E, Ritchie S, Metcalfe S, Van Bakel B, Thomas MG. Antibacterials dispensed in the community comprise 85%-95% of total human antibacterial consumption. J Clin Pharm Ther. 2018;43(1):59-64. https://doi.org/10.1111/cpt.12610

21. Zanichelli V, Monnier AA, Gyssens IC, et al. Variation in antibiotic use among and within different settings: a systematic review. J Antimicrob Chemother. 2018;73(suppl_6):vi17-vi29. https://doi.org/10.1093/jac/dky115

22. Suda KJ, Hicks LA, Roberts RM, Hunkler RJ, Matusiak LM, Schumock GT. Antibiotic Expenditures by Medication, Class, and Healthcare Setting in the United States, 2010-2015. Clin Infect Dis. 2018;66(2):185-190. https://doi.org/10.1093/cid/cix773

23. Sanchez GV, Fleming-Dutra KE, Roberts RM, Hicks LA. Core Elements of Outpatient Antibiotic Stewardship. MMWR Recomm Rep. 2016;65(6):1-12. https://doi.org/10.15585/mmwr.r6506a1

24. McNulty CA, Leonk MA, Hawking MK, Roberts C, Quigley A, Butler CC. How much information about antibiotics do people recall after consulting in primary care? Fam Pract. 2016;33(4):395-400. https://doi.org/10.1093/fampra/cmw022

25. Hassall MA, Arief M, Saleem F, et al. Assessment of attitudes and practices of young Malaysian adults about antibiotics use: a cross-sectional study. Pharm Pract (Granada). 2017;15(2):929. https://doi.org/10.18549/pharmpract.2017.02.929

26. Francis NA, Gillespie D, Nuttall J, et al. Antibiotics for acute cough: an international observational study of patient adherence in primary care [published correction appears in Br J Gen Pract. 2013 Jan;63(608):12]. Br J Gen Pract. 2012;62(s99):e429-e437. https://doi.org/10.3399/bjgp12x649124

27. Pradipita IS, Ronais E, Kartikawati AD, et al. Three years of antibacterial consumption in Indonesian Community Health Centers: The application of anatomical therapeutic chemical/defined daily doses and drug utilization 90% method to monitor antibacterial use. J Family Community Med. 2015;22(2):101-105. https://doi.org/10.4103/2230-8229.155385

28. Hadi U, Duerink DO, Lestari ES, et al. Survey of antibiotic use of individuals visiting public healthcare facilities in Indonesia. Int J Infect Dis. 2008;12(6):622-629. https://doi.org/10.1016/j.ijid.2008.01.002

29. Yosmar R, Flitria A, Yuliandra Y, Ariffin H. Evaluation of parents’ adherence in giving antibiotics on Respiratory Tract Infections (RTI) and factors associated with adherence. Res J Pharm Biol Chem Sci. 2016;7(1):1662-1665.

30. Widowati I, Wirawan I, Nopiyani N, Sari K. Pharmacist counseling intervention to improve patient antibiotic compliance. Public Health Prev Med. 2018;62(2):128-134. https://doi.org/10.15562/phpm.v62i2.159

31. Widayati A, Suryawati S, de Crespiagyn C, Hiller J. Self Medication with Antibiotics in Yogyakarta City Indonesia: A Cross Sectional Population-Based Survey. BMC Res Notes. 2011;4(1):491. https://doi.org/10.1186/1756-0500-4-491

32. Djawara DP, Setiadji AP, Setiawan E. [Behavior analysis and attributed factors to non prescription antibiotic used in Surabaya]. Indonesian J Public Health. 2018;14(4):406-417

33. Badan Pusat Statistik - BPS Kota Malang. [Malang City in figures, 2019]. Malang: PGS; 2019. https://malangkota.bps.go.id/publication/2019/08/16/3398128e03217db7b7af4399/kota-malang-dalam-angka-2019.html (accessed Feb 21, 2020).

34. Agustina R, Darto T, Sitompul R, et al. Universal health coverage in Indonesia: concept, progress, and challenges. Lancet. 2019;393(10166):75-102. https://doi.org/10.1016/s0140-6736(18)31647-7

35. Lwanga S, Lemeshow S. Sample size determination in health studies. Geneva: WHO; 1991.

36. Ministry of Health Republic of Indonesia (MoH-RI). [Ministry of Health Regulation number 72 of 2016 on standards of pharmacy practice in hospitals]. Jakarta: MoH-RI; 2016.

37. Ministry of Health Republic of Indonesia (MoH-RI). [Ministry of Health Regulation number 73 of 2016 on standards of pharmacy practice on pharmacies]. Jakarta: MoH-RI; 2016

38. Oswald D, Sherratt F, Smith S. Handling the Hawthorne effect: the challenges surrounding a participant observer. Rev Soc Stud. 2014;1(1):53-73.

39. Ministry of Health Republic of Indonesia (MoH-RI). [Role of pharmacists in patient safety]. http://farmakies.kemkes.go.id/2013/02/tanggung-jawab-apoteker-terhadap-keselamatan-pasien-patient-safety/ (accessed 2019 Mar 14)

40. Badan Pengawas Obat dan Makanan. [Indonesian drug formulary]. Jakarta: BPOM; 2015. http://pionas.pom.go.id/ioni/pedoman-umum (accessed Feb 21, 2020).
1. Davis TC, Wolf MS, Bass PF 3rd, et al. Literacy and misunderstanding prescription drug labels. Ann Intern Med. 2006;145(12):887-894. https://doi.org/10.7326/0003-4819-145-12-200612190-00144
2. Wolf MS, Davis TC, Shrank W, et al. To err is human: patient misinterpretations of prescription drug label instructions. Patient Educ Couns. 2007;67(3):293-300. https://doi.org/10.1016/j.pec.2007.03.024
3. Hamrosi KK, Raynor DK, Aslani P. Enhancing provision of written medicine information in Australia: pharmacist, general practitioner and consumer perceptions of the barriers and facilitators. BMC Health Serv Res. 2014;14:183. https://doi.org/10.1186/1472-6963-14-183
4. Krisnanta IK, Parfati N, Presley B, Setiawan E. Analysis of profile and contributing factors to non-adherence towards antibiotics utilization among caregivers of paediatric patients. J Manag Pharm Pract. 2018;8(1):39-50. https://doi.org/10.22146/jmpf.33730
5. Wilson HL, Daveson K, Del Mar CB. Optimal antimicrobial duration for common bacterial infections. Aust Prescr. 2019;42(1):5-9. https://doi.org/10.18773/austprescr.2019.001
6. Republic of Indonesia (RoI). [Law number 36 of 2014 on healthcare workers]. Jakarta: RoI; 2014.
7. International Pharmaceutical Federation. FIP guidelines for the labels of prescribed medicines. http://www.fip.org/www/uploads/database_file.php?id=256&table_id (accessed Aug 8,2020).
8. British Medical Association and the Royal Pharmaceutical Society. British National Formulary. London: BNF; 2020.
9. Pharmaceutical Society of Australia. Cautionary advisory labels in practice. Australian Pharmacist. 2013;32(8):34-35.
10. Koster ES, van Meeteren MM, van Dijk M, et al. Patient-provider interaction during medication encounters: A study in outpatient pharmacies in the Netherlands. Patient Educ Couns. 2015;98(7):843-848. https://doi.org/10.1016/j.pec.2015.03.007
11. Krueger JL, Hermansen-Kobulnicky CJ. Patient perspective of medication information desired and barriers to asking pharmacists questions. J Am Pharm Assoc (2003). 2011;51(4):510-519https://doi.org/10.1331/japha.2011.10069
12. Wibowo Y, Parsons R, Sunderland B, Hughes J. An evaluation of community pharmacy-based services for type 2 diabetes in an Indonesian setting: patient survey. PeerJ. 2015;3:e1449. https://doi.org/10.7717/peerj.1449
ABOUT THE JOURNAL

About Pharmacy Practice

Pharmacy Practice is a free available, open access, peer-reviewed journal with a scope on pharmacy practice. All the articles are free-access without delay (no embargo period). Pharmacy Practice is published using a continuous flow system with four issues quarterly closed.

Although focusing on the practice of pharmacy, Pharmacy Practice covers a wide range of pharmacy activities, such as, pharmaceutical care, social pharmacy, pharmacy education, process and outcome research, clinical pharmacy, health promotion and education, health informatics, and pharmacoeconomics, as well as many others.

Having an international scope is a major goal for Pharmacy Practice. See the list of authors (https://www.pharmacypractice.org/index.php/pp/search/authors) since 2007.

Pharmacy Practice is being indexed and abstracted at PubMed (https://www.ncbi.nlm.nih.gov/pubmed/?term=22pharm+pract+%28granada%29%22), Pubmed Central (https://www.ncbi.nlm.nih.gov/pmc/journals/21677/), Embase, Scopus (https://www.scopus.com/), Elsevier EJS, Directory of Open Access Journals (http://doaj.org/doi/fab343a90224ac249e98e5e9e3a15), Web of Science (ESCI), Dimensions (https://app.dimensions.ai/discover/publication?or_facet_source_title=journ.1297411), Open J-gate, ERH Plus (https://erhdimensions.ai/discover/publication/or_facet_source_title=journ.1297411), Scielo (http://scielo.scienceesccelero.ph/ph/serial&pid=1885-642X&lang=en&nr=1), Diaphant, (http://diaphant.unirioja.es/servlet/revista?codigo=8046), IBECS, REDHB (http://redhb.org/recursos/Record/oai_revista227-pharmacy-practice), Redalyc (http://www.redalyc.org/revista.oa?id=690).

For more information on Pharmacy Practice publication delay and peer-review process, visit our reviewers (https://www.pharmacypractice.org/index.php/pp/reviewers) web page and the editorial Pharm. Pract (Granada) 2019;17(1):1502 (https://www.pharmacypractice.org/index.php/pp/article/view/1502). For information about requirements for manuscripts, visit our authors guidelines (https://www.pharmacypractice.org/index.php/pp/about/submissions/authorGuidelines) web page.

Pharmacy Practice is a peer-reviewed journal. To make the peer review process work properly, it is necessary to count with a wide pool of prestigious peer reviewers, experts in different areas in journal’s scope. Pharmacy Practice has created a peer reviewer selection process based on searching in PubMed for articles closely related to each manuscript awaiting evaluation (see a description of the peer reviewer selection process (http://www.pharmacypractice.org/wp-content/uploads/2016/08/review-process.pdf)). We aim to ensure the expertise of each reviewer in the specific topic. Working as a peer-reviewer in Pharmacy Practice has no remuneration. See the list of peer reviewers (https://www.pharmacypractice.org/index.php/pp/list_reviewers) who have collaborated in Pharmacy Practice.
Editorial & Advisory Boards

Pharmacy Practice Editorial Board

David A. Holdford (associate editor)
Virginia Commonwealth University (USA)

Shalom I. Benrimoj
University of Granada (Spain)

Karen B. Farris
University of Michigan (USA)

Martin Schulz
Freie Universitaet Berlin and ABDA – Federal Union of German Associations of Pharmacists (Germany)

Cassiano J. Correr
Federal University of Parana (Brazil)

Fernanda S. Tonin
Federal University of Parana (Brazil)

Jonathan Penm
University of Sydney (Australia)

Meagen Rosenthal
University of Mississippi (USA)

Carrie M. Blanchard
University of North Carolina (USA)

Sarah Dineen-Griffin
University of Technology Sydney (Australia)

—

Advisory Board

Marja Airaksinen, University of Helsinki (Finland)
Simon Bell, University of South Australia (Australia)
John Buchelt, Virginia Commonwealth University (USA)
Maria Cordina, University of Malta (Malta)
Souheil Hallit, Holy Spirit University of Kaslik (Lebanon)
Mohamed A. Hassali, University Sains Malaysia (Malaysia)
James Hoehns, University of Iowa (USA)
Carmel Hughes, Queen’s University Belfast (UK)
Ulrich Jaehde, University of Bonn (Germany)
Rosemin Kassam, University of British Columbia (Canada)
David Nau, Pharmacy Quality Solutions (USA)
EDITORIAL

Authors, peer reviewers, and readers: What is expected from each player in collaborative publishing?

Fernando Fernandez-Llimos

Abstract 1079 | pdf Downloads 600
Page 2284

ORIGINAL RESEARCH

Antibiotic allergy as a cause of hospitalization in adults: a hospital-based study in Ukraine

Oksana Horodnya, Andriy Zimenkovsky

Abstract 791 | pdf Downloads 550
Page 2055

Self-medication consultations in community pharmacy: an exploratory study on teams’ performance, client-reported outcomes and satisfaction

Paulo Veiga, Afonso M. Cavaco, Luís V. Lapão, Mara P. Guerreiro

Abstract 718 | pdf Downloads 357
Page 2138

Public perceptions and experiences of the minor ailment service in community pharmacy in Scotland

Page 2152
Adherence to the Mediterranean diet decreases the risk of stroke in the Lebanese population: a case-control study

Maya El-Hajj, Pascale Salameh, Samar Rachidi, Amal Al-Hajje, Hassan Hosseini

Information on antibiotics in an Indonesian hospital outpatient setting: What is provided by pharmacy staff and recalled by patients?

Melani Naurita, Yosi I. Wibowo, Adj P. Setiadi, Eko Setiawan, Steven V. Halim, Bruce Sunderland

Polypharmacy among older Brazilians: prevalence, factors associated, and sociodemographic disparities (ELSI-Brazil)

Brayan V. Seixas, Gabriel R. Freitas

Dispensing errors in Lebanese community pharmacies: incidence, types, underlying causes, and associated factors

Lama Soubra, Samar Karout
Appraisal of the entrustable professional activities interprofessional team member domain performed by North Dakota pharmacists

David M. Scott, Michael P. Kelsch, Anqing Zhang, Daniel L. Friesner
Abstract 410 | pdf Downloads 185
Page 2179

Assessment of job satisfaction among community pharmacists in Baghdad, Iraq: a cross-sectional study

Inas R. Ibrahim, Mohamed I. Ibrahim, Ibrahim A. Majeed, Zahraa Alkhafaje
Abstract 457 | pdf Downloads 184
Page 2190

Physicians’ attitudes on the implementation of an antimicrobial stewardship program in Lebanese hospitals

Nathalie Sayegh, Souheil Hallit, Rabih Hallit, Nadine Saleh, Rouba Zeidan
Abstract 519 | pdf Downloads 406 online appendix Downloads 0
Page 2192

Effects of a national policy advocating rational drug use on decreases in outpatient antibiotic prescribing rates in Thailand

Onanong Waleekhalconloet, Thananan Rattanachotphanit, Chulaporn Limwattananon, Noppakun Thammatacharee, Supon Limwattananon
Abstract 736 | pdf Downloads 275 online appendix Downloads 0
Page 2201
Knowledge and behavior of consumers towards the non-prescription purchase of antibiotics: An insight from a qualitative study from New Delhi, India

Anita Kotwani, Jyoti Joshi, Anjana S. Lamkang, Ayushi Sharma, Deeksha Kaloni
Abstract 626 | pdf Downloads 529 online appendix Downloads 0
Page 2206

Assessment of drug-prescribing perception and practice among dental care providers: a cross-sectional Lebanese study

Aline Hajj, Christel Azzo, Souheil Hallit, Pascale Salameh, Hała Sacre, Frederic Abdou, Nada Naaman, Lydia Khabbaz
Abstract 513 | pdf Downloads 194
Page 2234

Community pharmacists’ use, perception and knowledge on dietary supplements: a cross sectional study

Josipa Bukic, Branka Kuzmanic, Doris Rusic, Mate Portolan, Ante Mihanovic, Ana Seselja Perisin, Dario Leskur, Ana Petric, Josko Bozic, Sinisa Tomic, Darko Modun
Abstract 559 | pdf Downloads 240
Page 2251

Determinants of COVID-19 vaccine acceptance in a high infection-rate country: a cross-sectional study in Russia

Van D. Tran, Tatiana V. Pak, Elena I. Gribkova, Galina A. Galkina, Ekaterina E. Loskutova, Valeria V. Dorofeeva, Rebecca S. Dewey, Kien T. Nguyen, Duy T. Pham
Abstract 1904 | pdf Downloads 831 online appendix Downloads 0
Page 2276
Attitudes towards COVID-19 vaccination, vaccine hesitancy and intention to take the vaccine
(https://www.pharmacypractice.org/index.php/pp/article/view/2317)

Maria Cordina, Mary A. Lauri, Josef Lauri
Abstract  5779 | pdf Downloads  2199
Page 2317

INTERNATIONAL SERIES

Integration of and visions for community pharmacy in primary health care in Denmark
(https://www.pharmacypractice.org/index.php/pp/article/view/2212)

Rikke N. Hansen, Lotte S. Nørgaard, Ulla Hedegaard, Lone Søndergaard, Kerly Servilleri, Susanne Bendixen, Charlotte Rossing
Abstract  1010 | pdf Downloads  634
Page 2212

Primary healthcare policy and vision for community pharmacy and pharmacists in Germany
(https://www.pharmacypractice.org/index.php/pp/article/view/2248)

Christiane Eickhoff, Nina Griese-Mammen, Uta Mueller, André Said, Martin Schulz
Abstract  895 | pdf Downloads  471
Page 2248

Policy and vision for community pharmacies in Finland: A roadmap towards enhanced integration and reduced costs
(https://www.pharmacypractice.org/index.php/pp/article/view/2288)

Marja Airaksinen, Terhi Toivo, Lenita Jokinen, Eeva Savela, Stina Parkkamäki, Charlotta Sandler, Hanna Kalliomäki, Maarit Dimitrow
Abstract  950 | pdf Downloads  486
Page 2288

REVIEW
Principles of pharmacoeconomic analysis: the case of pharmacist-led interventions
(https://www.pharmacypractice.org/index.php/pp/article/view/2302)

Fernanda S. Tonin, Ignacio Aznar-Lou, Vasco M. Pontinha, Roberto Pontarolo,
Fernando Fernandez-Llimos
Abstract 1202 | pdf Downloads 463
Page 2302

CPPI PRACTICE FORUM

Development of a centralized, remote clinical pharmacy service to enhance primary care
(https://www.pharmacypractice.org/index.php/pp/article/view/2348)

Rachel J. Finkelstein, Christopher P. Parker, Barcey T. Levy, Barry L. Carter,
Korey Kennelty
Abstract 411 | pdf Downloads 187
Page 2348

Make a Submission (https://www.pharmacypractice.org/index.php/pp/about/submissions)

Browse

Categories

» Pharm Pract (Granada) editorial policy
(https://www.pharmacypractice.org/index.php/pp/catalog/category/EditPolicy)

» Integration of community pharmacy in primary health care
(https://www.pharmacypractice.org/index.php/pp/catalog/category/integration)

» CPPI Practice Forum (https://www.pharmacypractice.org/index.php/pp/catalog/category/CPPI)

» Simulated Patient Technique
(https://www.pharmacypractice.org/index.php/pp/catalog/category/SimPatTech)

» Medication Adherence (https://www.pharmacypractice.org/index.php/pp/catalog/category/medadh)
Journal of Pharmacy Practice

The readership, like the pharmacy profession, is diverse and so are the topics covered in every issue. Since the walls between practice sites remain distinct yet continue to blend in the continuum of care, each pharmacy practitioner needs to be primed on a wide practice essentials, new advances, and future trends. By focusing on a single topic in each issue, the journal provides the reader with thorough review of that topic written by experienced and accomplished practitioners. Practice issues, practice settings, therapeutics, disease management, research, government, legal, and regulatory issues are reviewed in a timely manner. Each issue contains a list of forthcoming topics. We intend that the JPP will be of practical value to you. It has been used in daily practice as an informational refer and for teaching purposes; the focused, concise information is provided, saves time in literature review and provides a consolidated source. Information and opinion for topics that affect the profession of pharmacy and the patients that pharmacists serve. Each issue will then review a topic, providing a validating experience for the reader who is familiar with the topic and new applicable knowledge for the rest. This is no—validating for the expert, educating for the novice. Every effort has been made to ensure the correct usage of generic and trade and to verify drug uses. The ultimate responsibility, however, lies with the practitioner.

Join the conversation about this journal
The users of Scimago Journal & Country Rank have the possibility to dialogue through comments linked to a specific journal. The purpose is to have a forum in which general doubts about the processes of publication in the journal, experiences and other issues derived from the publication of papers are resolved. For topics on particular articles, maintain the dialogue through the usual channels with your editor.