Top 200 Prescribed Drugs Mostly Prescribed by the Physician in Pharmacies at Medan City

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Abstract. The drug information literatures usually contains thousands of drugs, which much of them were rare or never prescribed by the physicians. It caused pharmacy students must learn thousands of drugs that will depleted resources and the study result was not effective. The aim of the study was to identify 200 items of drugs that mostly prescribed by the physicians in the pharmacies at Medan City. The study was a descriptive study that used a cross sectional survey methodology. The 200 items of drugs that mostly prescribed by the physician obtained from the pharmacies selected regarding to random sampling method. The study was conducted from August to September 2016. The 200 items of drugs that mostly prescribed by the physician resulted from 21,962 prescribed drugs item of 16,352 prescriptions of 100 pharmacies. The list revealed that the most prescribed drugs was amoxicilline (5.55 %), followed by dexamethasone (4.44%), mefenamic acid (3.73%), cetirizine (3.16%), and ciprofloxacine (2.97%). It shows that the antibiotic drug was the most prescribed drug by the physician in pharmacies at Medan City. Further studies are required to develop the study card from the list.

1. Introduction
The Pharmaceutical care concept implementation was changed pharmacy practice around the world. The pharmacist role was not only responsible for product oriented but also to identify, manage and prevent the patient’s drug related problems [1]. Furthermore, the pharmacy education in the world has been changed in order to adopt the pharmaceutical care concepts. A pharmacy student required to learn more on knowledge and clinical skills i.e. pharmacology, pharmacotherapy, clinical pharmacy, drug management, psychology and communication, health promotion and disease prevention. The pharmacy student also must familiar with prescribed drug in order to deliver the pharmaceutical care services in community pharmacy setting [2] [3].

The drug information literatures usually contains thousands of drugs, which much of them were rare or never prescribed by the physicians. It caused pharmacy students must learn thousands of drugs that will depleted resources and the study result was not effective. This condition revealed that the pharmacy student and pharmacist need the drug information literature contains information of prescribed drug that utilized in pharmaceutical practice daily. The pharmacy students and pharmacists will able to learn effectively by the availability of this drug information literature.
Some countries have been developed the top 200 prescribed drugs mostly prescribed and have been evaluated to the list continuously. The United States developed the Pill Book [4] contain of 200 prescribed drugs mostly prescribed consumed by the community since 1984. The 200 prescribed drugs mostly prescribed in United State and other countries can be accessed through Intercontinental Marketing Services data base [5]. The 200 prescribed drugs mostly prescribed concept also has been accepted in North America extensively [6]. The University of Missouri-Kansas City (UMKC) also obligated the second and third year pharmacy student to pass a 50-multiple choice examination of the top 200 most frequently prescribed drug. This test aims to ensure that the pharmacy students have developed the knowledge base as the requirement to the later courses [7]. Therefore, the 200 mostly prescribed drugs were considered as a list that must learn by pharmacy students in order to implement the pharmaceutical care services effectively.

Recently, the 200 prescribed drugs that available was based on drug utilization in foreign countries and the list was not exactly similar with the drugs utilization in Indonesia. Based on the researcher tracer study, there is no 200 prescribed drugs list obtained from drugs utilization in Indonesia. This study aim to identify 200 prescribed drugs that mostly prescribed by physician in community pharmacies at Medan city. The top 200 prescribed drugs list obtained from this research will develop into a drug information literature in the further study.

2. Method
This study was a descriptive research that used a cross sectional survey methodology. The 200 prescribed drugs list obtained from the physician’s prescription retrospectively by direct survey to the selected community pharmacy at Medan City. The selection of community pharmacy was done by random sampling method. The study was conducted on August to September 2016.

Based on the health department of Medan City data, there are 617 (N) pharmacies at Medan City. The number of sample (n) was calculated by Slovin formula: n = N / (1+N e²) [8]. The study used 0.1 as error tolerance (e) and it was obtained 86 pharmacies as a minimum sample amount. The researcher added the sample amount to 100 pharmacies. The selected pharmacies located at 16 district area of 21 district area of Medan City.

The study assessed the two month of prescribed drug utilization in year of 2016 for every selected pharmacies. The study excluded non-prescribed drugs, vitamin and mineral supplements, vaccines and antisera, biopharmaceuticals and immunoglobulins from the list. The 200 drug lists were grouped and categorized with The Anatomical Therapeutic Chemical (ATC) classification system that recommended by the WHO for drug utilization studies [9].

3. Results and Discussions
3.1. Top 200 prescribed drugs
The 200 items of prescribed drugs that mostly prescribed by the physician resulted from 21,962 prescribed drugs item of 16,352 prescriptions of 100 pharmacies. The list revealed that the 10 (ten) mostly prescribed drugs was amoxicilline (5.55 %), followed by dexamethasone (4.44%), mefenamic acid (3.73%), cetirizine (3.16%), ciprofloxacine (2.97%), cefadroxil (2.83%), salbutamol (2.71%), diazepam (2.69%), domperidone (2.57%) and cefixime (2.19%) as shown in Table 1. The list obtained from this study shown a big difference with the list that published recently at the United States [10].
| No. | Drugs Name                  | %    | No. | Drugs Name                  | %    |
|-----|-----------------------------|------|-----|-----------------------------|------|
| 1   | Amoxicillin                 | 5.55 | 101 | Salmeterol                  | 0.13 |
| 2   | Dexametason                 | 4.44 | 102 | Hydrocortisone              | 0.13 |
| 3   | Mefenamic acid              | 3.73 | 103 | Fluconazole                 | 0.12 |
| 4   | Cetirizine                  | 3.16 | 104 | Pyrazinamide                | 0.12 |
| 5   | Ciprofloxacin               | 2.97 | 105 | Trimetazidine               | 0.12 |
| 6   | Cefadroxil                  | 2.83 | 106 | Fusidic acid                | 0.12 |
| 7   | Salbutamol                  | 2.71 | 107 | Lorazepam                   | 0.12 |
| 8   | Diazepam                    | 2.69 | 108 | Acetylcysteine              | 0.11 |
| 9   | Domperidone                 | 2.57 | 109 | Diphenhydramine             | 0.10 |
| 10  | Cefixime                    | 2.19 | 110 | Itraconazole                | 0.10 |
| 11  | Ibuprofen                   | 2.18 | 111 | Ceftriaxone                 | 0.10 |
| 12  | Na/K diclofenac             | 2.16 | 112 | Cefotaxim                   | 0.09 |
| 13  | Levofloxacin                | 2.11 | 113 | Gabapentin                  | 0.09 |
| 14  | Clindamycin                 | 2.03 | 114 | Miconazole                  | 0.09 |
| 15  | Amlodipine                  | 1.94 | 115 | Propranolol                 | 0.09 |
| 16  | Methylprednisolone          | 1.94 | 116 | Risperidone                 | 0.09 |
| 17  | Alprazolam                  | 1.83 | 117 | Baclofen                     | 0.08 |
| 18  | Ranitidine                  | 1.69 | 118 | Eperisone                   | 0.08 |
| 19  | Ambroxol                    | 1.63 | 119 | Gliclazide                  | 0.08 |
| 20  | Metampiron (Metamizole)     | 1.52 | 120 | Heparin sodium              | 0.08 |
| 21  | Cyproheptadine              | 1.39 | 121 | Hydrodgresterone            | 0.08 |
| 22  | Codeine                     | 1.33 | 122 | Erdosteine                  | 0.08 |
| 23  | Acetylsalicylic acid        | 1.33 | 123 | Ethambutol                  | 0.08 |
| 24  | Metronidazole               | 1.10 | 124 | Glyceril trinitrat          | 0.08 |
| 25  | Clarithromycin              | 1.17 | 125 | Noscapin                    | 0.08 |
| 26  | Meloxicam                   | 1.14 | 126 | Clebopride                  | 0.07 |
| 27  | Lansoprazole                | 1.00 | 127 | Citicoline                  | 0.07 |
| 28  | Mecobalamin                 | 0.99 | 128 | Cyclophosphamide            | 0.07 |
| 29  | Metformin                   | 0.98 | 129 | losartan                    | 0.07 |
| 30  | Triamcinolone               | 0.94 | 130 | Clofirstabol                | 0.06 |
| 31  | Isoniazid                   | 0.94 | 131 | Digoxin                     | 0.06 |
| 32  | Betamethasone               | 0.94 | 132 | mometason furoate           | 0.06 |
| 33  | Rifampicin                  | 0.87 | 133 | Timolol                     | 0.06 |
| 34  | Glimepiride                 | 0.87 | 134 | Valsartan                   | 0.06 |
| 35  | Omeprazole                  | 0.82 | 135 | Candesartan                 | 0.06 |
| 36  | Sulfaethoxazole and         | 0.81 | 136 | Allylestrenol               | 0.06 |
| 37  | Erythromycin                | 0.80 | 137 | Fexofenadine                | 0.06 |
| 38  | Furosemide                  | 0.80 | 138 | Mependazole                 | 0.06 |
| 39  | Ramipril                    | 0.76 | 139 | Hydrochlorothiazide         | 0.06 |
| 40  | Oxymetazoline               | 0.76 | 140 | Cilostazol                  | 0.05 |
| 41  | Loratadine                  | 0.76 | 141 | Clomiphen sitrat            | 0.05 |
| 42  | Thiamphenicol               | 0.49 | 142 | Desloratadine               | 0.05 |
Table 1. Cont.

|   | Drug Name       | Concentration | Description                     | Dose |
|---|-----------------|---------------|---------------------------------|------|
| 43 | Doxycycline     | 0.67          | Gliquidone                      | 0.05 |
| 44 | Simvastatin     | 0.66          | Latanoprost                     | 0.05 |
| 45 | Chlorpromazine  | 0.65          | Procatel HCl                    | 0.05 |
| 46 | Nystatin        | 0.65          | Simetidin                       | 0.05 |
| 47 | Azithromycin    | 0.62          | Dapagliflozin                   | 0.05 |
| 48 | Mupirocin       | 0.62          | Insulin                         | 0.05 |
| 49 | Carbamazepine   | 0.59          | Isosorbide mononitrat           | 0.05 |
| 50 | Gentamicin      | 0.55          | Norfloxacin                     | 0.05 |
| 51 | Allopurinol     | 0.51          | Polymyxin B                     | 0.05 |
| 52 | Captopril       | 0.50          | Telmisartan                     | 0.05 |
| 53 | Prednisolone    | 0.50          | Trihexyphenidyl                 | 0.05 |
| 54 | Sucralfate      | 0.50          | Diltiazem                       | 0.05 |
| 55 | Tranexamic acid | 0.50          | Famotidine                      | 0.05 |
| 56 | Atorvastatin    | 0.50          | Prilocain                       | 0.05 |
| 57 | Bisoprolol      | 0.50          | Maprotiline HCl                 | 0.05 |
| 58 | Epinephrine     | 0.49          | Methotrexate                    | 0.05 |
| 59 | Triprolidine    | 0.48          | Tamsulosin                      | 0.05 |
| 60 | Aciclovir       | 0.46          | Pipemidate acid                 | 0.04 |
| 61 | Ondansetron     | 0.42          | Phenytoin                       | 0.04 |
| 62 | Ketoconazole    | 0.41          | Irbesartan                      | 0.04 |
| 63 | Spironolactone  | 0.41          | Isosorbide dinitrat             | 0.04 |
| 64 | Betahistine     | 0.40          | Pantoprazole                    | 0.04 |
| 65 | Clopidogrel     | 0.40          | Piroxicam                       | 0.04 |
| 66 | Butylscopolamine| 0.36          | Fluticasone                     | 0.04 |
| 67 | Ofloxacin       | 0.35          | Terfenadine                     | 0.04 |
| 68 | Lisinopril      | 0.34          | Levodopa and                    | 0.04 |
| 69 | Metoclopramide  | 0.32          | Acarbose                        | 0.04 |
| 70 | Methylergometrin| 0.31          | Bromhexin                       | 0.04 |
| 71 | Phenobarbital   | 0.30          | Ceftazidime                     | 0.04 |
| 72 | Glibenclamide   | 0.29          | deksketoprofen                  | 0.04 |
| 73 | Ioxsuprine      | 0.27          | Etoricoxib                      | 0.04 |
| 74 | Ketorolac       | 0.26          | Flunarizine                     | 0.04 |
| 75 | Amitriptyline   | 0.26          | Morphine                        | 0.04 |
| 76 | Celecoxib       | 0.25          | Olanzapine                      | 0.04 |
| 77 | Chloramphenicol | 0.25          | Pregabalin                      | 0.04 |
| 78 | Nifedipin       | 0.25          | Rabeprazole                     | 0.04 |
| 79 | Ketoprofen      | 0.24          | Tinoridine                      | 0.04 |
| 80 | Loperamide      | 0.24          | Tizanidine                      | 0.04 |
| 81 | Theophylline    | 0.24          | Clocortolone                    | 0.03 |
| 82 | Tobramycin      | 0.23          | Dextromethorphan                | 0.03 |
| 83 | Tramadol        | 0.23          | Dimethindene Maleat             | 0.03 |
| 84 | Desoximetasone  | 0.23          | Tolterodine                     | 0.03 |
| 85 | Atenolol        | 0.22          | Budesonide                      | 0.03 |
| 86 | Misoprostol     | 0.20          | Haloperidol                     | 0.03 |
The US list revealed levothyroxine as the most prescribed drug followed by rosuvastatin, esomeprazole, salbutamol and fluticasone propionate. It shown that the lists published at foreign country were different and not suitable with the local drug utilization. As a conclusion, in order to develop a drug list as a learning tool, it is better to use a local drugs utilization data. The pharmacy students, academics staff or pharmacists may get benefit from this list, but they must remember that different areas have different prescribing patterns [2].

Pharmacy students must possess as much as possible with prescribed drug knowledge before enter the pharmaceutical practice clerk as a part of their education program in Indonesia education system. This list will enable the pharmacy student and pharmacists to learn the prescribed drug information effectively because they just focus on the most utilized prescribed drugs that use daily in community pharmacy practice. The drug list also very useful for a continuing professional development program for pharmacists and build the pharmacy student’s confidence before they face the real patients at the community pharmacy practice setting.

### 3.2. Drug utilization by Therapeutic class

The study categorized prescribed drugs by ATC classification system as shown in Table 2.

#### Table 2. The top 10 prescribed drugs utilization by therapeutic class (n=21,962)

| No. | Therapeutic Class                              | Percentage |
|-----|-----------------------------------------------|------------|
| 1   | Antibacterial                                 | 24.60      |
| 2   | Antiinflammatory and Antirheumatic            | 10.13      |
| 3   | corticosteroids                               | 9.49       |
| 4   | Antihistamines                                | 6.39       |
| 5   | Psycholeptics                                 | 5.62       |
| 6   | Drug for acid related disorder                | 4.40       |
| 7   | Drugs for obstructive airway diseases         | 3.71       |
| 8   | Cough and Cold preparations                   | 3.29       |
| 9   | Propulsives                                   | 2.57       |
| 10  | Drugs used in Diabetes                        | 2.42       |
Table 2 revealed the five most frequently drugs prescribed by physician in pharmacies based on therapeutic class was antibacterial (24.60%), antiinflammatory and antirheumatic (10.13%), corticosteroids (9.49%), antihistamines (6.39%), and psycholeptics (5.62%). It shown that antibacterial was the most frequently prescribed drug with the percentage of utilization as much as 24.60%. The five most antibacterial drugs prescribed by the physician were amoxicillin (5.55%), ciprofloxacin (2.97), cefadroxil (2.83%), cefixime (2.19%), and levofloxacin (2.11%). This antibacterial utilization (24.60%) was much higher than antibacterial utilization (7%) at UK [2]. This high utilization of antibacterial has caused some important implications. The utilization of antibacterial drugs at community pharmacy setting usually was done by empirical method. The physician determined the kind of antibacterial based on empirical experience and literature review, not based on microbiological culture test. This condition will increase the resistance risk of antibacterial utilization. The high utilization and costly forms of antibacterial are needs to be regulated closely. The utilization of some antibacterial also needs to assess whether they were prescribed appropriately or not [11].

The list showed the five most utilized prescribed drugs based on volume prescription and therapeutic class (Table 1 and Table 2) were contain of three drugs, besides amoxicillin and ciprofloxacin (antibiotics), i.e. dexametasone (4.44%), mefenamic acid (3.73%), and cetirizine (3.16%). The drugs were indicated to relieve symptomatic condition of the diseases (symptomatic therapy) but not to cure the diseases (curative therapy). Each of these drugs has some adverse drug reaction, i.e. dexametasone can cause osteoporosis, peptic ulcer, glaucoma, etc.; mefenamic acid can cause arrhythmia, palpitation, vomit/nausea, gastrointestinal perforation, ulcus peptic, etc.; and cetirizine can cause sedative, dizzy, diarrhea, vomit/nausea, cough, etc [14]. This condition has some consequences related to the drugs utility in order to use the symptomatic drugs safely. Pharmacists must counsel the patients that the symptomatic drugs should only use for short period and the patient must stop use the drugs if the symptoms were relieved in order to prevent or minimize the occur of drugs side effects.

The psycholeptics drug was the fifth most utilized prescribed drugs (5.62%) in community pharmacy practice. The percentage came from high number of prescribed items. The two most utilized psycholeptics drug was diazepam and alprazolam (80.42% of all psycholeptics drugs). Diazepam and alprazolam usually prescribed for anxiety, seizure, and insomnia indication. These drugs can cause adverse drug reaction i.e. drawziness, muscle weakness, ataxia, amnesia, depression, etc. [14] Pharmacy students and pharmacists must be aware of this drugs adverse drug reaction especially if the drugs were prescribed for long term diseases treatment. The pharmacists must encourage and prepare the patient mental condition in order to increase the patient’s adherence for long term diseases treatment and prevent or minimize the adverse drug reaction events.

### 3.3. Drug utilization by Generic and branded name

The study categorized prescribed drugs by generic and branded name classification as shown in Table 3.

**Table 3. Generic names Vs Branded names (n=21.962)**

| Generic Names | Branded Names |
|---------------|---------------|
| 9844 (44.82%) | 12.118 (55.18%) |

Table 3 revealed branded names of drugs (55.18%) was more frequently prescribed by physician in pharmacies than generic name (44.82%). This generic names utilization was smaller than generic names utilization at United Kingdom (57.5%) or United States (8 in 10 prescriptions) [2] [13]. The government was promoted the generic drugs utilization from few years ago by the Law of Health Ministry No. 02/Menkes/068/I/2010 [12]. This study revealed that the generic names utilization was still low and the government needs to evaluate their program continuously.
4. Conclusions
The 200 items of drugs that mostly prescribed by the physician resulted from 21,962 prescribed drugs item of 16,352 prescriptions of 100 pharmacies. The top 200 list revealed that the most prescribed drugs was amoxicilline (5.55 %), followed by dexamethasone (4.44%), mefenamic acid (3.73%), cetirizine (3.16%), and ciprofloxacine (2.97%). The study revealed antibacterials drug as the most prescribed drug by the physician in pharmacies at Medan City. Further studies are required to develop the learning tool from the list.

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