

Pattern of Household Drug Storage

Gambaran Ketersediaan Jenis Obat di Rumah Tangga

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Abstract

Household storage of pharmaceutical is world-widely practice, including in Indonesia. The purpose of this study was to obtain the pattern of medicine storage, the sources and reasons of medicine kept in households. A cross-sectional survey was conducted on October 2011, involving 250 adult household respondents, randomly selected from three subdistricts in North Jakarta, and have approved the written consents, and interviewed with structured questionnaire. Data were performed in univariate and bivariate analysis with chi square test. The majority of household (82%) stored drugs at home; analgesic-antipyretic nonsteroidal anti-inflammatory was the type of drugs kept by mostly (76.1%) of household. Out of 1001 stored drugs formulation encountered, about 31% were ethical drugs, mostly (64.8%) obtained from authorized pharmacies, purchased without prescription (71.9%), kept for future use (37.6%), and were leftover medicines (31.6%). Among the leftovers, 39.2% were ethical drugs including anti infective agents (31.5%). The leftover ethical medicines and anti infective agents could be indicated as inappropriate storage of pharmaceuticals and may lead to drug related problems.

Keywords: Drug storage, ethical drugs, household, over the counter drugs

Abstrak

Penyimpanan obat di rumah tangga banyak dilakukan oleh masyarakat, namun tidak banyak informasi bagaimana obat disimpan dan digunakan oleh rumah tangga di Indonesia. Penelitian ini bertujuan memperoleh data pola obat di rumah tangga, sumber mendapatkannya, dan alasan obat disimpan. Survei potong-lintang dilakukan pada Oktober 2011, melibatkan secara acak 250 responden rumah tangga dewasa dari tiga kecamatan di Jakarta Utara yang dipilih purposif dan bersedia diwawancarai dengan menandatangani *informed consent*. Kuesioner terstruktur digunakan untuk memperoleh data obat. Dilakukan analisis data univariat dan bivariat dengan uji kai kuadrat. Mayoritas responden (82%) menyimpan obat, dengan jenis obat terbanyak analgesik-antipiretik dan anti-inflamasi nonsteroid (76,1%).

Dari 1001 produk obat yang disimpan, 31% adalah obat etikal. Sebagian besar obat tersebut (64,8%) diperoleh dari apotek, dibeli tanpa resep dokter (71,9%), dan sengaja disimpan untuk persediaan jika sakit (37,6%) serta merupakan obat sisa resep (31,6%). Diantara obat sisa resep, sejumlah 39,2% adalah obat etikal, diantaranya termasuk anti-infeksi (31,5%). Adanya penyimpanan obat sisa resep berupa obat etikal dan anti-infeksi menggambarkan penyimpanan obat yang irasional dan dapat memicu masalah terkait obat termasuk risiko terjadinya *medication error*.

Kata kunci: Penyimpanan obat, obat etikal, rumah tangga, obat bebas

Introduction

Household storage of pharmaceuticals is widely practice either in developed or mostly in developing countries, among others are in order to self-medication practices and for emergency purposes.¹⁻⁵ A vigorous pharmaceutical drug promotion and the availability of a variety of medicines over the counter on the market makes it easy for people accessing the medicines; that is probably one reason people store medicines at home to take any time if needed for self-medication in reducing and alleviating pains and sufferings. Self medication is a universal phenomenon and practiced globally with varied frequency and an effort to address health problems without consulting the medical professional.^{6,7}

In general, classification of drugs according to pharmacy legislation consists of prescription (ethical) and over the counter (OTC) drugs.⁸ OTC drug is a drug that can be purchased without written prescription, and is

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safe and effective for use by the general public without supervision of a health professional. Kinds of OTC drugs, i.e. acetaminophene (paracetamol), antacids, cough and cold remedies, is use as a symptomatic drug to treat self limiting-diseases. Self medication is rational as long as for treating minor illnesses and symptoms which can be self-diagnosed as a self-limiting disease (i.e. common-cold, headache) and using OTC drugs only. On the other side, ethical drug is a drug that is available only with written instruction (prescription) from a health professional (a doctor or a dentist) to a pharmacist. Kinds of ethical drug such as antibiotics, antihypertensive, corticosteroids, is use to cure a disease that can only be diagnosed by a doctor. These kinds of drugs are not rational for self medication and should be used under supervision from a doctor; so we (the patients) will receive appropriate doses for an adequate period of time in accordance with their clinical needs (diagnoses).

However, kinds of medicines usually stored in household are not only the OTC drugs which can be purchased without prescription, but there may also ethical drugs, which either still in current used, or a leftover prescription drug. Stored of leftover prescription in household may bring about problems in medication error. Remaining pills which stored at home in uncontrolled environment might be expired and sometimes degrades to less active or toxic components. Re-use of leftover drugs for self initiated treatment is unsafe, especially antibiotics and other prescription drugs which should be used under supervision of medical professional.

There is less information and studies in Indonesia about type of medicine (i.e. OTC and ethical drugs) stored in the household. The purpose of this pilot study is to obtain the pattern of medication storage i.e. type of medicine (OTC and ethical drugs), sources of the stored medicines, how to purchase (with or without prescription) and reasons of medicine kept in households.

Method

An explorative, cross-sectional pilot survey was chosen to investigate the medicines storage in households. The survey was conducted in North Jakarta district, on October 2011. North Jakarta district is chosen purposively in accordance with location of the college involved in the study. Population were all households in North Jakarta, and samples were randomly selected from three sub-districts (*kecamatan*) purposely chosen. Inclusion criteria of the household respondent were adult persons (18 years old or above), male or female, and have approved the written consents. They who refused the written consent and not able to communicate were excluded. The eligible respondents were interviewed using a structured questionnaire as an instrument. As a prerequisite, all drugs in household were calculated by its brand-name

or generic name, ignoring their formulation. Each of brand/generic-drugs was counted as one preparation. Data were analyzed in univariate and bivariate (Chi-Square test) to present frequency distribution and the difference between types of medicine (OTC/ethical drugs) based on reasons of medicines kept in household.

Results

Two hundred and fifty respondents, 197 (78.8%) female, and aged between 20 – 58 years, were interviewed and about 82.0% (205) of them kept medicines at home; mostly (61.5%) kept 1-5 medicine at home and the average number of medicines stored is 4.9. (Figure1)

The analgesic-antipyretic-nonsteroid anti-inflammatory drugs (NSAID) is the most preferred type of drug being kept by households (76.1%). The detailed breakdown of the proportion of household with type of drugs available at home is shown at Figure 2.

Table 1 shows number of drugs by type, sources, how to purchase, and reasons of medicine kept in households (the medicine 'status'). The total number of drugs stored in the household is 1,001 formulation, mostly consists of OTC drugs; most drugs obtained from authorized pharmacies and obtained without prescriptions.

Table 2 shows small amounts of ethical drugs available at household obtained from unauthorized pharmacy and some ethical drugs purchased without prescription.

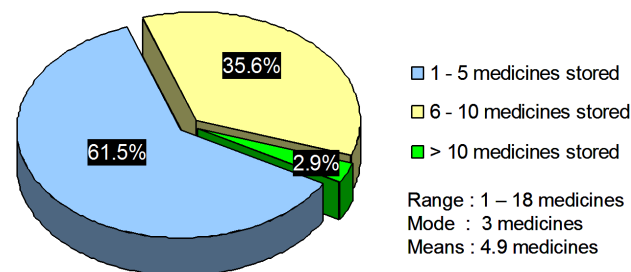


Figure 1. Proportion of Household with The Number of Medicines Stored (n=205)

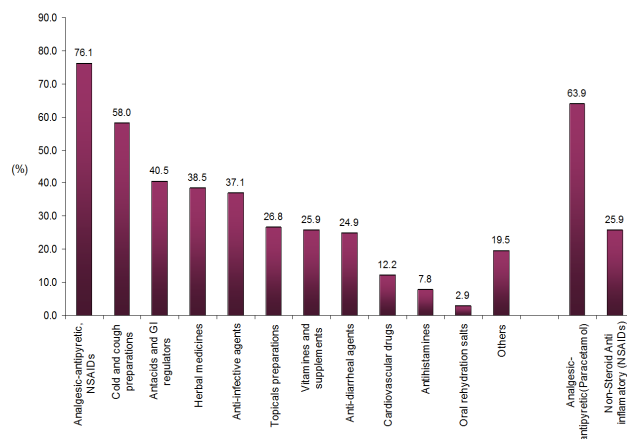


Figure 2. Proportion of Household with Type of Medicines (Therapeutic Classification) Stored (n = 205)

It is shown that small amounts of ethical drugs obtained from un-authorized pharmacy and some ethical drugs purchased without prescription.

Based on 'status' of household medicine (i.e. reasons of medicines being kept at home), OTC drugs were the type of drug mostly stored at home either in current use, or as leftovers, or as drugs being kept for future use, compared to ethical (prescription) drugs, and the difference is significant ($p=0.000$, Chi-Square test, Table 3).

Table 4 shows therapeutic classification of the leftover ethical drugs stored at home. Anti-infective agent is found among leftover ethical drugs.

Discussion

The prevalence of household medicines found in this pilot study about 82.0%, was relatively high, although does not represent for a wide population. Other studies especially conducted in some developing countries also

reported high prevalence rates of stored drugs.^{3,9-11} OTC drug was the most type of drugs being kept in household compare to ethical drugs (69.1% vs. 30.9%). The five most common drugs available in the households were analgesics-antipyretic and nonsteroid anti-inflammatory drugs (NSAIDs) (76.1%), cold and cough formulations (58.0%), antacids and gastro-intestinal regulators drugs (40.5%), herbal medicines (38.5%), and anti-infective agents (37.1%) (Figure 2). Anti-infective agents found included antibiotics, antifungal, and antiviral. The proportion of anti-infective agents among other household medicines is 37.1%, relatively high compared to other similar studies done in other countries.^{12,13}

Analgesic-antipyretic paracetamol is reasonable kept at home as a stock for future use since it is a symptomatic drug for relieving pain and fever. That is a common symptom that can be self-diagnosed and usually is a subject for self-medication. A similar thing also goes for cold and cough preparations and some antacids. Pattern of household medicines storage is similar to other studies in which the most commonly medicine stored were analgesic, formulations for respiratory diseases, and gastro-intestinal drugs.¹²⁻¹⁴ However, beside OTC drug such as paracetamol, about 25.9% of households also kept non-steroid inflammatory drugs (NSAIDs), i.e. mefenamic acids, piroxicam, diclofenac sodium, which were ethical medicines that will be inappropriate for self-treatment (Figure 2).

Approximately 31% of all drugs kept in households were ethical drugs (Table 1). Ethical drug is a drug that is available only with written instructions from a doctor or dentist to a pharmacist. Ethical drug in Indonesia

Table 1. Number of Drugs by Type and Source of Medicines, How to Purchase, and Status of Medicine in Households (N=1001)

| Characteristics | Category | N | % |
|---------------------------------|----------------------------------|-----|--------|
| Type of drugs kept in household | Ethical drugs | 309 | (30.9) |
| | OTC drugs | 692 | (69.1) |
| Sources of medicines | Authorized pharmacy ^a | 649 | (64.8) |
| | Drug store ^b | 352 | (35.2) |
| How to purchase medicines | With prescription | 281 | (28.1) |
| | Without prescription | 720 | (71.9) |
| Status of household medicines | In current use | 309 | (30.9) |
| | Leftover (prescription) drugs | 316 | (31.6) |
| | Kept for future use | 376 | (37.6) |

Notes:

^aincluding pharmacy in public health centers (*puskesmas*), hospitals, clinics

^bincluding supermarkets and roadside-stalls

Table 2. Types of Drugs Stored at Home by Sources and How to Purchase the Medicines

| Characteristics | Category | Types of Drugs (N, %) | | | | Total |
|---------------------------|------------------------------------|-----------------------|--------|-----|--------|-------------|
| | | Ethical | | OTC | | N (%) |
| Sources of medicines | Authorized pharmacy ^a | 283 | (43.6) | 366 | (56.4) | 649 (100.0) |
| | Unauthorized pharmacy ^b | 26 | (7.4) | 326 | (92.6) | 352 (100.0) |
| How to purchase medicines | With prescription | 184 | (65.5) | 97 | (34.5) | 281 (100.0) |
| | Without prescription | 125 | (17.4) | 595 | (82.6) | 720 (100.0) |

Notes:

^aincluding pharmacy in public health centers (*puskesmas*), hospitals, clinics

^bdrug-stores, supermarkets and roadside-stalls

Table 3. Types of Drugs Stored by Their 'Status' in Household

| Status of Household Medicines (reasons of drugs kept at home) | Types of Drugs (N, %) | | | | Total | Significance (Chi-Square test) |
|--|-----------------------|---------------|------------|---------------|---------------------|-----------------------------------|
| | Ethical | | OTC | | N (%) | |
| In current use | 127 | (41.1) | 182 | (58.9) | 309 (100.0) | P=0.000 (CI 95%) |
| Leftover drugs | 124 | (39.2) | 192 | (60.8) | 316 (100.0) | |
| Kept for future use | 58 | (15.4) | 318 | (84.6) | 376 (100.0) | |
| Total | 309 | (30.9) | 692 | (69.1) | 1001 (100.0) | |

Table 4. Number of Leftover Ethical Drugs by Therapeutic Classification

| Therapeutic Classification | N | % |
|--|------------|--------------|
| Anti infection | 39 | 31.5 |
| Analgesic, antipyretic, NSAID | 27 | 21.8 |
| Antacid and GI regulators | 11 | 8.9 |
| Topical preparations (eye/ear drops, dermatological) | 11 | 8.9 |
| Cough and cold preparations | 5 | 4.0 |
| Others | 31 | 26.0 |
| Total | 124 | 100.0 |

(known as “*Obat Keras*”) is labeled with a red-circle sign with a “K” inside the circle, and a written sign “*Harus Dengan Resep Dokter*” (With Prescription Only).¹⁵ The use of ethical drug should be under supervision of medical professionals (doctor or dentist), because unlike OTC drug, ethical drug is indicated for symptoms and diseases that can only diagnose by doctors. The doses, route of administration and how long it should be taken depends on the type of diseases and the property of the drug. The risks and benefits of using ethical drugs can only be judged by medical professional. There might be a potential harmful and unsafe to using ethical drugs for self-treatment.¹⁶

OTC drug is labeled with a green- or blue-circle sign, means that the drug can be purchased “free” without prescription;¹⁷ however the blue-circle also means that the drug should be used with precaution and not more than 3 days for self-treatment.

Results from this study shows that most of medicines were obtained from authorized pharmacies (*apotek*) as a formal source of drugs, including pharmacies at public health centers (*puskesmas*), hospitals or clinics (Table 1). However, there were also some ethical drugs obtained from drug stores, even had been purchased without prescription (Table 2). As a matter of fact, that is against drug regulation which assigned to purchasing ethical drugs should be with a physician’s prescription only. Drug Regulation also states that ethical drugs should be sold in an authorized pharmacy under supervision and responsibility of a pharmacist, and should not be sold in an unlicensed drug-store.¹⁸ An authorized pharmacy can assure ethical drugs for its quality and safety, especially important for live-saving medications such as anti infective, anti-hypertension, cardiovascular drug and drugs which can easily abused such as psychotropic. While in informal or unlicensed drug store, quality of drugs being sold might be uncertain since some counterfeited, expired, and substandard drugs had ever found.¹⁹

Compare to ethical drugs, OTC drugs were the most type of drugs kept at home for all reasons, either being in current use, kept for the future, or leftover drugs, and the difference is statistically significant (Table 3). In spite of this, some leftovers (39.2%) identified as ethical drugs

indicated that there were a number of non-adherent patients in consuming prescribed medications. However, one of the limitations of this study was that we did not determine whether leftover stored in households was actually due to poor patient compliance where patients did not complete the entire course of medications as prescribed, or whether the leftover medicines was simply due to too large packaging of the medicines. Out of 124 leftover ethical drugs, about 39 (31.5%) of the drugs were anti-infective agents (Table 4), indicated that the patients did not follow the full course of anti-infective. In relating to poor compliance with anti-infective use, the impact is not only such as treatment failures, but may also trigger the development of resistant micro-organisms.

Noncompliance in taking medications might influence therapeutic outcomes because the recommended dosage of medication is not adequately consumed, especially those life-saving drugs such as drugs for the treatment of diabetes, hypertension, epilepsy, tuberculosis, AIDS, organ transplants etc.²⁰ For example, poor compliance with antihypertensive therapy is the most important reason for uncontrolled blood pressure which may increase the risk of stroke, myocardial infarction, and renal impairment markedly. Various factors causing therapeutic non-compliance were identified from the literature review,²¹ among others were patient-related factors (e.g. demographic, psychosocial, patient-doctor relationship, physical difficulties etc.), therapeutic-related factors (e.g. route of administration, treatment complexity, duration of treatment, adverse reactions etc.), healthcare system, social economics and disease factors. However, in this study we did not explore such factors.

Another concern to the leftover medicines is the possibility of those drugs being abused, shared or consumed inappropriately by others (someone else such as family members, neighbors, friends etc., assuming that the other people suffer from the “same disease”). There is a report of leftover and unused medication caused the increasing in emergency visits for children under age five due to medication poisoning.¹⁴ Sharing or using of leftover prescription drug to others may increase the risk of medication errors which results in adverse drug events,^{22,23} especially if the leftover is an ethical drug which should actually be used under medical supervisions. It may not be a problem if the leftover shared with others is a symptomatic OTC medication appropriates for self-medication, such as paracetamol analgesic, as long as this drug is still in good condition (stored properly) and has not yet expired.

Conclusion

OTC drugs are type of drugs mostly kept in household. This type of drug is appropriate for self medication. Most of drugs in households obtained from authorized

pharmacies, mostly purchased without prescription and there were some ethical drugs among them. Reasons of medicine kept in households either being in current use, kept for the future, or leftover drugs were comparable. Some leftover medicines found were ethical and anti infective agents, could be indicated as inappropriate storage of pharmaceuticals and may lead to drug-related problems.

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