

# Indonesia basic health survey: self-medication profile for diarrhea with traditional medicine

Ani Isnawati<sup>1</sup>, Retno Gitawati<sup>2</sup>, Mariana Raini<sup>1</sup>, Sukmayati Alegantina<sup>1</sup>, Vivi Setiawaty<sup>1</sup>

1. Center for Research and Development for Biomedical and Basic Health Technology, National Institute of Health Research and Development, Jakarta, Indonesia.
2. Center for Research and Development for Health Resources and Services, National Institute of Health Research and Development, Jakarta, Indonesia.

## Abstract

**Background:** In Indonesia, diarrhea is an endemic disease and often leads fatal and an outbreak potential. Diarrhea can occur for several days and often can be cured without any medication. Commonly, to treat diarrhea at the first time is by doing self-medication. Basic health survey data in 2013 showed that 15.7% of Indonesian people kept and used traditional medicines (TM).

**Objective:** This study was conducted to find out the characteristic of Indonesian people do for diarrhea self-medication.

**Method:** We analyzed household data cross-sectionally from the 2013 basic health survey in 33 provinces and 497 cities in Indonesia. Data analysis included household characteristics, economic status, education, information of getting and keeping the TM, and status of the TM kept in households.

**Result:** The result showed 89% of households store traditional medicines. Traditional diarrhea medicines were stored by 66.54% households in the urban, and were mostly obtained from traditional medicine store, stored for supply 55.86%, and used only if needed 50.65%.

**Conclusion:** The study concluded that mostly people preferred to keep and use traditional Indonesian medicine produced by the TM national industry rather than others. Duration of use for self-medication in most of the households is thought to be appropriate.

**Keywords:** Traditional medicine, diarrhea, self-medication.

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## Introduction

Diarrhea in Indonesia is still considered as endemic disease as well as potential outbreak that often caused death. In 2015, there were 18 diarrhea outbreaks located in 11 provinces, 18 municipals/cities, with 1213 patients and 30 people death. Its Case Fatality Rate (CFR) is 2.47%.<sup>1</sup> Based on Basic Health Survey (BHS) 2013, diarrhea incidence and diarrhea prevalence period by all ages in Indonesia were respectively 3.5% and 7%. Five provinces

that have high incidence and prevalence of diarrhea are Papua, South Sulawesi, Aceh, West Sulawesi, and Central Sulawesi. Diarrhea incidence of toddler age in Indonesia is 10.2%.<sup>2</sup>

One can suffer from diarrhea for days and often recover or symptoms disappear without medication. However, some cases can suffer from diarrhea for a week or more, so that diarrhea can be considered as an acute and chronic disease. The first action people usually do to cure diarrhea, including acute diarrhea, is undertaking self-medication. Basic Health Survey stated that out of 35.2% households that stored all kinds of medicines, some of them (15.7%) stored traditional medicine (TM)<sup>2</sup> and among them was used for treating diarrhea. Further analyses of all medications used for diarrhea in households showed that most used TM for diarrhea was 19.2%.<sup>3</sup> According to WHO, self-medication is preferred by individual to cure the disease using modern, herbal, or TM.<sup>4</sup>

### Corresponding author:

Vivi Setiawaty,  
Center for Research  
and Development for Biomedical  
and Basic Health Technology,  
National Institute of Health Research  
and Development, Jakarta, Indonesia.  
Email: [vivisetiawaty@hotmail.com](mailto:vivisetiawaty@hotmail.com)

Indonesia has more than 25.000 flowering plant species, 55% of them are endemic. Even today, the development of molecular biology leads to the disclosure of potential secret of living things. Therefore the richness of biodiversity is very valuable, especially as genetics resource.<sup>5</sup> Although scientific concepts of TM are not systematically documented, people living far from modern medical facilities have experienced the benefits of TM using natural remedies.

Conventional and traditional medicine both are used in self-medication for non-specific diarrhea, but how widely TM being used is not known. Therefore, it is necessary to perform analysis on self-medication pattern of TM used for diarrhea, as information to how widely it is used as an alternative medication; so that it can be integrated into health services.

### Material and methods

All data were obtained from Basic Health Survey (BHS) 2013, that was a community-based research conducted periodically since 2007 and it collected baseline data of health indicators in Indonesia, and these analyzed descriptively using cross-sectional design. The study populations were all households in 33 provinces, 497 districts/cities. Limitations in BHS 2013 included non-sampling errors i.e.: census blocks that were not affordable or were conflict areas in the region; households were not found; household members who could not be interviewed due to unavailable at the time of interview until completing data

collecting; and estimation of district level that could not apply in the research due to limited samples for analysis.

Data was descriptively analyzed, and included: household characteristics (domicile, head of household's education, and economic status); how TM was obtained; where and how many kinds of TM were stored and its status (the purpose to store). Bivariate analysis was carried out to obtain the relationship between TM and education status as well as economic status. Traditional medicines that mentioned in this research were remedies for diarrhea.

This study received ethical approval No. LB.02.01/5.2/KE.006/2013 from the National Institute of Health Research and Development Ethics Committee, Ministry of Health, Republic of Indonesia

### Results and discussions

Results from BHS 2013 based on interviews and observations indicate that 103,860 (35.2%) out of 294,959 households in Indonesia stored medicine for self-treatment where 16,306 (15.7%) stored TM and among which, 1076 households kept and were using TM for diarrhea in practicing self-medication. Traditional medicine for diarrhea were stored both by communities in urban and rural areas, with a rather higher storage by the community in urban areas (66.54%) than in the rural.

Variation of TM for diarrhea in self-medication was categorized as Traditional Indonesian herbal medicine, herbs (medicinal plants simplicia), and traditional Chinese medicine (TCM), as seen in Table 1.

**Table 1:** Variation of traditional medicine for diarrhea kept and used by households in self-medication

No.	Variation of Traditional Medicine	Percentage %
1	Traditional Indonesian herbal medicine	88.94
2	Herbs/medicinal plants simplicia	8.27
3	Traditional Chinese medicine (TCM)	2.79

Most households (88.9%) used Traditional Indonesian herbal products for diarrhea, and in small amounts there were potion/herbs or medicinal plants simplicia (8.3%) and TCM (2.8%) that also used for diarrhea. Traditional Indonesian herbal medicine products were preferred maybe because they are easily obtained and the price is

relatively cheaper than imported herbal products such as TCM. Simplicia used for diarrhea included guava leaves, curcuma rhizome, annona leaves, blackcumin seeds and herbal tea.

Traditional Indonesian herbal medicine as an industrial herbal product is produced by the TM national industry.

It can be identified by the name which is registered in the Indonesia National Agency of Drug and Food Control (BPOM) as herbal medicines (jamu) or non-medicinal products. On the other hand, potion/herbs used which consists of 1 (one) or more fresh or dried medicinal plants (simplicia), produced by herb traditional sellers.

Strong tendency to use natural ingredient medicine is not only practiced in Indonesia, but also in many countries because this kind of treatment is implementing “back to nature” concept which is believed has less side effects compared to modern medicine. Research in Egypt showed that 77.5% of people practice self-medication using complementary or alternative medicine, and 91.6% of them using herbals. Among others, the used of herbal for constipation symptoms (constipation, colic, diarrhea, vomiting, heartburn) reached 88%.<sup>6</sup>

Diarrhea medication using traditional medicine is also widely used in the world. There are several herbal used as anti-diarrhea, such as tea leaves, blackberry leaves, (*Rubus fruticosus*), raspberry leaves (*Rubus idaeus*), Carob powder (*Ceratonia siliqua*), bilberry extract (*Vaccinum myrtillus*), (*Agrimonia eupatorium*), garden spurge leaves (*Euphorbia hirta*), bitter melon leaves (*Momordica charantia*), “tears of the virgin”/bawang Dayak bulbs (*Eleutherine bulbosa*).<sup>7,8</sup> Traditional anti diarrhea medicine from China is usually a mixture of several herbals, such as *Coptis chinensis rhizome*, *Coix lacryma jobi*, rice (*Oryza sativa*), lotus seed (*Nelumbo nucifera*), *Dioscorea*, *Zingiber officinale*, guava leaves (*Psidium guajava*), dates (*Phoenix dactylifera*). *Cuscuta chinensis*, *Psoralea corylifolia*, Black cardamon (*Amomum subulatum*).<sup>9</sup> People mostly used guava leaves to cure diarrhea based on empirical experience. Some researches show that *Psidium folium*, *Curcumae domesticae rhizome* and *Granati pericarpium* have been proven showing anti diarrhea effect, through mechanism of action such as antimicrobial, anti-inflammatory, and antispasmodic activity, increased reabsorption of water and electrolyte.<sup>8,10,11</sup>

The key persons who understood about herbal in household, its storage and usage for diarrhea were interviewed. They were housewives, mostly (61.71%) with low education level (Table 2). Based on household economic status, it was seen that most households applying TM to diarrhea were households with upper middle class category (63.01%, Table 2). The economic status of the household was determined based on the index of household ownership.

**Table 2.** Percentage of households stored traditional diarrhea medicine by characteristics

No.	Household characteristics	Proportion of Household	
		n	Percentage (%)
<b>Domicile</b>			
1.	Urban	716	66.54
2.	Rural	360	33.46
		1076	100,00
<b>Education (key person/housewife)</b>			
	Low educated*	664	61.71
	High educated**	412	38.29
		1076	100.00
<b>Economic status based on ownership index</b>			
1.	Lower to middle	398	36.99
2.	Upper-middle to upper	678	63.01
		1076	100.00

\* uneducated to junior high school

\*\* senior high school to university graduated

Households obtained the traditional diarrhea medicine from different sources, mainly from traditional medicine stores (64.78%) and common drug stores (28.07%), but in small amounts (2.88%) it was also came from conventional medicine sources such as public health center, hospital, clinics as well as from medical staff (Table 3). This

is reasonable given that TM include the non-prescription (OTC) drug which can be purchased without a prescription in common drugstores, although there were some of those remedies that were also prescribed (for example “phytopharmaca”, which is a TM that has been proven the safety and efficacy through clinical trials before it is registered).

**Table 3.** Sources/places to obtain household traditional medicine for diarrhea

No.	Obtaining of traditional medicine	Households	
		n	Percentage (%)
<b>Places to obtain (source of household traditional medicine)</b>			
1.	Traditional medicine store	697	64.78
2.	Common drugstore	302	28.07
3.	Traditional health services, jamu/herbal medicine seller	35	3.26
4.	Public health center, hospital, clinic, medical staff (nurse, pharmacist, doctor)	31	2.88
5.	Given by someone	11	1.02
<b>Total</b>		<b>1076</b>	<b>100.00</b>

The existence (status) of TM storage in households showed that they stored the remedy mostly as supply for the yet to come diarrhea (55.86%), and as the leftover medicines (38.29%). It cannot be disclosed the reason why many households stored traditional diarrhea medicines for supplies or kept leftover remedies. This is probably because the use of traditional diarrhea medicine is one of the appropriate efforts for self-treatment of mild diarrhea, is readily available, and for some types of traditional Indonesian medicine the price is relatively affordable although not all traditional medicine is cheap, especially TCM.<sup>12</sup>

The important thing to note is the storage and expiration date of these traditional medicines, considering the possibility of the drug being contaminated with molds because of inadequate storage.

Duration of use that was about 1 – 3 days for most of the households (38.75%) and used as needed (50.65%), is thought to be appropriate for self-medication since non-specific/acute diarrhea is a limiting disease (Table 4). Chi-square analysis for household characteristic and status of the traditional medicines stored for diarrhea is shown in Table 5.

**Table 4.** The proportion of households that kept traditional medicines according to its present status and duration of use

No.		Proportion of Households	
		n	Percentage (%)
<b>Status of stored traditional medicine</b>			
1.	Medicines are in use	63	5.86
2.	Leftover	412	38.29
3.	As supply for yet to come diarrhea	601	55.86
		1076	100.00
<b>Duration of use</b>			
1.	1-3 days	417	38.75
2.	4-7 days	64	5.95
3.	More than 7 days	40	3.72
5.	Use as needed	545	50.65
6.	Don't know	10	0.93
		1076	100.00

**Table 5.** The relationship between households characteristics and the status of stored traditional medicines for diarrhea

Household Characteristics	Traditional medicine for diarrhea (%):			Chi-square test (p value)
	In used	Leftover	As supply for yet to come diarrhea	
<b>Domicile:</b>				
Urban	4.6	37.6	57.8	0.024 <sup>a</sup>
Rural	8.3	39.7	51.9	
<b>Education (key-person/housewife):</b>				
Low educated*	8.0	39.0	53.0	0.031 <sup>a</sup>
High educated**	4.4	37.8	57.8	
<b>Economic status based on ownership index:</b>				
Lower to middle	6.3	42.7	51.0	0.048 <sup>a</sup>
Upper-middle to upper	5.6	35.7	58.7	

a : significant (p < 0.05)

\* : uneducated to junior high school

\*\* : senior high school to university graduated

There was statistically difference ( $p < 0.05$ ) between household characteristics (domicile, education of the key-person/housewife, and economic status) and the purpose of keeping those remedies in their home. The in-used remedies as well as the leftover were significantly higher in rural compare to urban household, with lower educated of the key-person, and lower economic status.

It seems that rural households with low education and low economic status tend to choose traditional medicine. This is in line with the results of other studies that have been done before.<sup>13</sup> However, households in urban kept more remedies as supply for yet to come diarrhea compared to rural households. Presumably this is because urban households have sufficient funds to purchase medicines

(including traditional medicines) to store for supplies, although this assertion needs further research.

The use of traditional medicines in rural areas more often than in urban areas is related to the beliefs of rural people who generally prefer the use of traditional medicine because it is considered more efficacious, cheap and is a tradition of heredity.<sup>14,15</sup> Other study revealed that people chose traditional medicine (herbs) because they felt that it was safer than pharmaceutical/modern medicine and had no side effects.<sup>6</sup> However in fact traditional medicine cannot be said to be an effective drug if it does not cause side effects, because the side effects of a substance (drug, traditional medicine) is an augmentation of the therapeutic effect of the substance.<sup>12</sup>

Leftover remedies were significantly higher in households with low-educated key-persons, possibly related to poor adherence to complete the treatment.<sup>16</sup> As long as they are OTC drugs, the remnant traditional remedies may still be used again for self medication if storage and drug conditions are still good enough and not yet expired.<sup>17</sup>

### Conclusion

Registered Traditional Indonesian herbal medicine for diarrhea produced by the TM national industry was the most traditional diarrhea medicine kept and used in households compared to TCM or dried/fresh medicinal plants simplicia (herbs), mostly obtained from traditional medicine stores, as well as from common drug stores.

The in-used remedies as well as the leftover were significantly higher in rural compare to urban households, with lower educated of the key-person, and lower economic status. On the other hand, households in urban kept more remedies as supply for yet to come diarrhea compared to rural households.

Duration of use of the traditional diarrhea medicines for most of the households in self-medication is thought to be appropriate, i.e. used for 1 – 3 days and used as needed.

### Competing interest

The authors declare that they have no competing interests.

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