การรับรู้ผลสัมฤทธิ์ในการรักษาโรคติดเชื้อทางเดินหายใจส่วนบน ของผู้ป่วย ณ หน่วยบริการปฐมภูมิ จังหวัดฉะเชิงเทรา
Perceived Efficacy of Treatment for Upper Respiratory Tract Infection among Patients at Primary Care Units in Chachoengsao Province

นิพนธ์ต้นฉบับ

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Original Article

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บทคัดย่อ

วัตถุประสงค์: เพื่อประเมินการรับรู้ผลสัมฤทธิ์ในการรักษาโรคติดเชื้อทางเดินหายใจส่วนบน (Upper Respiratory Infection; URI) ของประชาชน จ.ฉะเชิงเทรา ตามหลักการการใช้ยาอย่างสมเหตุผล **วิธีการศึกษา:** การวิจัยเชิงสำรวจมีกลุ่มตัวอย่างเป็นผู้รับบริการ ณ หน่วยบริการปฐมภูมิจำนวน 447 คน ที่มีประวัติการรักษา URI ในช่วง 6 เดือนก่อนรวบรวมข้อมูล ใช้แบบสอบถามที่ผู้วิจัยสร้างและผ่านการประเมินคุณภาพด้านความตรงเชิงเนื้อหาโดยผู้ทรงคุณวุฒิ 3 ท่าน มีคำถาม 4 ส่วนหลัก 1) ข้อมูลทั่วไปของตัวอย่าง 2) การได้รับข้อมูลข่าวสารการรักษา URI บริการที่ได้รับ และความร่วมมือกินยาและการปฏิบัติตัว 3) การรับรู้ผลสัมฤทธิ์ในการรักษา URI และ 4) การปฏิบัติตัวหลังได้รับรู้ผลสัมฤทธิ์ในการรักษา **ผลการศึกษา:** ผู้ป่วยที่ไม่ได้รับยาปฏิชีวนะรับรู้ว่าตนหายเป็นปกติและดีขึ้นจากอาการเจ็บคอ, ไอหรือเสมหะ, น้ำมูก และปวดหัวเป็นไข้ร้อยละ 80.1, 83.8, 83.4 และ 82.5 ตามลำดับ และผู้ป่วยที่ไม่ได้รับยาปฏิชีวนะก็มีค่าร้อยละใกล้เคียงกันในทุกอาการ (P-value > 0.05) ผู้ป่วยพึงพอใจผลการรักษาในระดับมากถึงมากที่สุดถึงร้อยละ 85.9 หากมีอาการป่วยจาก URI อีกจะกลับมารับบริการที่หน่วยบริการปฐมภูมิเดิมร้อยละ 94.2 **สรุป:** ผู้รับบริการรักษา URI ทั้งได้รับยาและไม่ได้รับยาปฏิชีวนะมีการรับรู้ผลสัมฤทธิ์ในการรักษาไม่ต่างกัน โดยรับรู้ว่าหายเป็นปกติหรืออาการดีขึ้น ส่วนใหญ่พึงพอใจต่อผลการรักษาระดับมากถึงมากที่สุด และจะกลับมารับบริการ ณ หน่วยบริการปฐมภูมิอีก บุคลากรที่หน่วยบริการปฐมภูมิควรให้ความสำคัญกับการอธิบายเหตุผลและการใช้ยาปฏิชีวนะเท่าที่จำเป็น

คำสำคัญ: การรับรู้, ผลสัมฤทธิ์ในการรักษา, โรคติดเชื้อทางเดินหายใจส่วนบน, หน่วยบริการปฐมภูมิ

Abstract

Objective: To assess perceived treatment efficacy for upper respiratory tract infection (URI) among patients in Chachoengsao proince, Thailand, based on rational drug use basis. **Methods:** This survey study had 447 patients receiving care 6 months prior to the survey at primacy care units (PCUs) in Chachoengsao province as participants. The questionnaire was developed and tested for content validity by experts. Questionnaires asked 1) demographic characteristics, 2) information about URI, URI care provided, and medication compliance, 3) perceived URI treatment efficacy, 4) practice after the perceived efficacy. **Results:** Perceived efficacy of URI treatment as "cured or better" was found for sore throat, cough and phlegm, nasal mucus, and fever/headache at 80.1%, 83.8%, 83.4%, and 82.5% of participants, respectively. Proportions of participants no antibiotics with perceived "cured or better" for eah symptoms were similar to those with antibiotics (P-value > 0.05). 85.9% reported the most and highly satisfied combined and 94.2% would seek URI care at the ame PCU. **Conclusion:** URI patients with and without antibiotic prescriptions had similar perceived efficacy of treatment with mostly for "cured" or "better." Satisfaction was high. They would seek URI care in the future at the same PCU. Providers should emphasize the rationale for limited antibiotics use.

Keywords: perception, treatment efficacy. Upper respiratory tract infection, primary cae unit

Introduction

Inappropriate drug use has been one of the major public health problems worldwide. The World Health Organization (WHO) has estimated that more than half of drug use is inappropriate including drug use with no indication, lack of evidence of drug efficacy, lack of concerns of drug expenditure and efficacy, and sustainability of welfare and healthcare system, redundant drug use, drug use inconsistent with recommended guidelines, and lack of concerns of microbial resistance. WHO defines rational drug use (RDU) as the situation that "the patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community."[1] This WHO definition of RDU is consistent with that of Thai National List of Essential Drugs (NLED) stating that RDU refers to the use of medications with indication, quality, efficacy, reliable

evidence, clinical benefits surpassing risk, appropriate cost based on health economics, no redundancy, and concerns on microbial resistance. Thai RDU is based on steps of drug selection with appropriate dosage and administration, duration of treatment, with acceptance from the patient and sustainability from responsible payers. RDU also assures non-discrimination and rejection to individuals to access needed medications.[2] Problems of irrational drug use has been found despite the Thai RDU policy.

Data of the National Health Security Office (NHSO) in 2012 indicated that irrational drug use in upper respiratory tract infection (URI) not exceeding the criterion of 20% of patients was found in 3% of 900 public hospitals.[3] The 2011 national drug policy incorporated RDU as the second strategy for national drug system policy 2012 – 2016. This policy aims at promoting the drug use of drugs by physicians, healthcare providers and the public to be rational, appropriate, cost-effective, and sustainable.[4-6] In 2016, the Ministry of Public Health declared RDU policy as the 15th Health Service Plan. All hospitals under the ministry's jurisdiction are expected to implement the policy known as the Rational Drug Use Hospital (RDU Hospital). One of many policies is that primary care units (PCUs) are expected to implement the Responsible Use of Antibiotics (RUA) which allows the use of antibiotics in the upper respiratory infection (URI) not more than 20%.[7]

Chachoengsao province has developed RDU management for all levels of healthcare service settings. Outcome assessments of RDU service plan in hospitals and PCUs in the province indicated that in the second trimester of the fiscal year of 2018, all 122 PCUs had antibiotic use in URI lower than the 20% criterion and the antibiotic use in URI decreased from 40% to 3.80% at the end of that fiscal year.[8,9]

Success in Responsible Use of Antibiotics (RUA) in PCUs is based on the healthcare provider's perspective. The other dimension of success is efficacy perceived by the patients which could indicate how to improve the RDU policy and make it more effective. There was a study assessing patients' perception towards treatment efficacy URI and diarrhea in PCUs in Muang district of Chachoengsao province.[10] However, the patients' perceived efficacy on URI treatment in PCUs in the whole Chachoengsao province has not been reported. Such study could better represent patients with diverse demographic characteristics.

This present study aimed to assess perceived efficacy on the treatment for URI in patients receiving care at PCUs in the whole Chachoengsao province, Thailand which includes all PCU in all 11 districts in the fiscal year of 2018. Patients with URI were those with sore throat, fever, nasal congestion, sneezing, running nose, cough, mucus, achy body, or weakness.[11] Perceived treatment efficacy was defined as feeling cured, better or not better at all after the treatment. Results could indicate the success of URI treatment based on the patient's perspective regardless of antibiotic use. The use of antibiotics in URI is limited by the RUA policy to less than 20%. The policy promotes the use of *Andrographis paniculata* capsule instead of antibiotics for URI. We expected that perceived efficacy and satisfaction of URI treatment between patients receiving antibiotics and *Andrographis paniculata* capsule were not different. In other words, we expected that proportions of patients receiving antibiotics and *Andrographis paniculata* capsule reporting being cured and better combined and high-to-highest satisfaction were not different.

Patient's compliance in self-care recommendations provided by healthcare providers at PCUs is critical for the efficacy of URI treatment. Compliance to recommendations could affect how the patient perceive the efficacy of URI treatment which could further motivate the patient to seek care at the PCU for future illness.[12,13] We examined whether patients who were compliant to the recommendation reported perceived efficacy of URI treatment differently from those who were less compliant.

Our study results could indicate that healthcare providers' recommendation and advice could positively affect the perception toward URI treatment in addition to the actual treatment results. Acceptance on recommendations and advice could also improve patient's satisfaction on the service and the motivation to seek the service for future illness.[14,15] Care of URI could be improved using the study results not only in Chachoengsao province but also in other provinces with similar demographic characteristics and healthcare service. Specifically, this study aimed to assess 1) perceived efficacy of URI treatment, 2) associations of receiving oral antibiotics and compliance to self-care with perceived URI treatment efficacy, 3) associations of prescriptions (antibiotics vs. Andrographis paniculata) with perceived URI treatment efficacy and satisfaction, and 4) and associations of perceived URI treatment efficacy with seeking more healthcare.

Methods

In this cross-sectional survey research, we assess perceived efficacy of URI treatment in patients receiving care at PCUs in the whole province of Chachoengsao. The study was conducted from January to March 2019.

Study population was URI patients receiving care at 122 PCUs in all 11 districts in Chachoengsao province in the fiscal year of 2018. Of these 122 PCUs, 117 of them were sub-district health-promoting hospitals and 5 were community health centers. URI was defined as a written diagnosis of URI in medical records which was usually found in patients with signs and symptoms of sore throat, fever, nasal congestion, sneezing, running nose, cough, mucus, achy body, or weakness. A total of 151,936 patients with at least one diagnosis of URI since July 2018 were found.

To be eligible, the patients had to be 15 – 65 years of age, live in Chachoengsao province, be able to communicate in Thai language, be listed in the electronic medical records (HOSxP®) of the PCUs, and be willing to participate in the study. They had to have at least 1 diagnosis of URI since July 2018.

The sample size was estimated based on the 151,936 patients in the sampling frame. Based on Yamane's estimation, with a 95% confidence level and 5% sampling error, a total of 400 participants were needed.[16,17] To compensate for incomplete data, a total of 450 participants were needed. Of the 11 districts, the number of participants for each district was proportional to the number of URI patients in individual districts.

In each district, only one PCU was randomly selected for recruiting participants. At each PCU, one healthcare provider was trained by the researcher for eligibility screening and data collection. Patients receiving care for URI between January and March 2019, were screened and selected by convenience sampling until the number needed was reached. Of the 450 participants participating in questionnaire completion, with 3 incomplete questionnaires, a total of 447 participants with complete questionnaires were obtained.

Research instruments

The questionnaire consisted of 4 parts developed by the researcher. The first part collected demographic characteristics including gender, age, marital status, education level, occupation, and monthly income. The second part asked about experience of healthcare service at the PCU, information about cold and sore throat disseminated by PCU, service provided by PCU regarding history taking, physical examination, medication prescribed, recommendations, and compliance in self-care and medication taking. The third part asked about perceived efficacy on URI treatment with the possible response of cured, better, still the same, worse, and not sure. After judging the efficacy of the URI treatment resuts, they received, the fourth part asked about what they did after being cured, bette, worse or unchanged. Participants were asked about satisfaction toward treatment efficacy (from low, to moderate, high, and highest level), and what to do if any other future symptoms of URI either seeking care at the same PCU, hospital or clinic, drugstore, or not seeking care but self-care only.

The questionnaire was examined for content validity by three experts including a general practice physician and two nurses at a tertiary hospital. All questions had acceptable content validity with Index of Item Objective Congruence of more than 0.5.[18]

Ethical considerations

This research project was approved by the Ethics Committee for Human Study of Chachoengsao Provincial Health Administration Office according to the US Belmont Report (approval number: PH_CCO_REC 009/2561; approval date: July 20, 2018). Participations was based on voluntary basis. Written informed consent form was obtained before participation. Participant's information was kept confidential and presented as a summary.

Data collection procedure

The research assistant approached URI patients in the medical record registry for eligibility screening. Prospective participants who met the eligibility criteria were informed about objectives, process and voluntary nature of the study. They could withdraw from the study at any time. Once a written informed consent form was obtained, the research asked the participants to complete the questionnaire in a private area. The self-administered questionnaire took about 10 minutes to complete.

Data analysis

Descriptive statistics including frequency with percentage and men with standard deviation (SD) were used to summarize demographic characteristics and study measures of the participants. Associations between categorical variables were tested using Chi-square test or Fisher's exact test as appropriate. Statistical significance for all statitiscal tests was set at a type I error of 5% (or P-value < 0.05). All statistical analyses were performed using the SPSS software program version 20.0.

Results

Of the 447 participants with complete questionnaires, most of them were women (68.2%), 51 – 60 years old (23.9%), married (58.4%), with primary school education (41.9%), agricultural workers or general labors (58.1%), and with low income of less than 10,000 baht per month (53.5%) (Table 1).

Table 1 Demographic characteristics of the participants (N = 447).

Characteristics	N	%
Gender		
Male	142	31.8
Female	305	68.2
Age (yrs)		
15 — 20	57	12.8
21 — 30	88	19.7
31 — 40	83	18.6
41 — 50	84	18.8
51 — 60	107	23.9
61 — 65	28	6.2
Marital status		
Single	153	34.2
Married	261	58.4
Widowed/divorced or separated	33	7.4
Educational level		
Elementary school	187	41.9
Junior high school	106	23.7
Senior high school	72	16.1
Vocational or high vocational school	48	10.7
Bachelors' degree or higher	34	7.6
Occupation		
Student	49	11.0
Government officer/ Government enterprise employee	24	5.4
Private company employee	54	12.1
Small business owner	60	13.4
Agricultural worker/ General labors	260	58.1
Monthly income (Baht)		
No income	62	13.9
Less than 10,000	177	39.6
10,000 – 15,000	137	30.6
15,001 – 20,000-	49	11.0
20,001 – 25,000	13	2.9
More than 25,000	9	2.0

Most participants sought care for URI at PCUs in their community (93.5%), followed by public hospitals (27.7%), private clinics (19.5%), and drugstores (15.9%) (Table 2). Most received information about URI treatment (93.7%) with mostly from PCU healthcare providers (74.5%), followed by online media (37.0), and television (36.8%). At PCUs, most received history taking service (95.7%), followed by physical examination (82.1%). Not many participants received oral antibiotics (20.4%); while the majority received antipyretics (72.6%), followed by antitussives/mucolytics (71.0%), nasal decongestants (69.4%), and Andrographis paniculata capsule (55.7%). Most participants were compliant with medications by

Table 2 Care seeking behaviors for URI at the PUCs of the participants (N = 447).

Care seeking behaviors	N	%
Place to seek URI treatment (more than 1 option applicable)		
Primary care units in community	418	93.5
Hospital	124	27.7
Private clinic	87	19.5
Community pharmacy	71	15.9
Grocery stores where medication available	23	5.1
Ever receiving information about URI treatment		
Yes	419	93.7
No	28	6.3
Sources of URI treatment information (more than 1 option applicable) (n = 419)		
Leaflet	106	25.3
Poster	58	13.8
Television	154	36.8
Radio	41	9.8
Online media, e.g., Facebook, Line, or websites	155	37.0
Physician or pharmacist at the hospital	134	32.0
PCU healthcare providers	312	74.5
Relatives, neighbors, or acquaintances	73	17.4
Services provided at PCU (more than 1 option applicable)		
History taking	428	95.7
Physical examination	367	82.1
Medication prescribed (more than 1 medication applicable)	445	99.6
Antipyretics	323	72.6
Nasal decongestant	309	69.4
Antitussives / mucolytics	316	71.0
Oral antibiotics	91	20.4
Andrographis paniculata (capsule)	248	55.7
Compliance with medication prescriptions (n = 445)		
Completely taking medications prescribed	373	83.8
Not completing taking medications as prescribed	67	15.1
Not at all taking as prescribed	5	1.1
Receiving advice for self-care practice (more than 1 choice applicable)	440	98.4
Adequate rest	383	87.0
Avoid drinking cold or ice water, drink warmer or room-temperature water.	382	86.8
Use face mask	295	67.0
Keep social distancing	179	40.7
No advice received	7	1.6
Compliance with self-care advice (n = 440)		
Following all advices	321	73.0
Not completely following all advices	104	23.6
Not following any advices	15	3.4

completely taking medications as prescribed compliance with prescriptions (83.8%). Most also received self-care advice from providers at PCUs (98.4%) of which most of them were about adequate rest (87.0%), followed by avoiding ice of cold water (86.8%), and wearing facemask (67.0). The majority of participants followed the advice (73.0%) (Table 2).

Perceived URI treatment efficacy

Of the 447 participants, 356 of them reported not receiving antibiotics for URI (79.6%) (Table 3). Most of these participants reported their sore throat was cured and better combined (80.1%), while cough and phlegm, nasal mucus, and fever/headache were found to be cured and better combined in 83.8%, 83.4%, and 82.5%, respectively. Among 91 participants receiving antibiotics, most of them reported their sore throat, cough and phlegm, nasal mucus, and fever/headache were cured and better combined in 89.0%, 73.6%, 80.3%, and 73.6%, respectively (Table 3).

Table 3 Perceived efficacy of URI treatment among participants NOT receiving antibiotics (n = 356).

Symptoms	N (%) of participants by perceived treatment efficacy				
	Cured	Better	Not changed	Worse	No symptom at the beginning
Participants not receiving antibiotics					
Sore throat	107 (30.1)	178 (50.0)	8 (2.2)	2 (0.6)	61 (17.1)
Cough and/or phlegm	123 (34.6)	175 (49.2)	8 (2.2)	2 (0.6)	48 (13.4)
Having nasal mucus	155 (43.5)	142 (39.9)	6 (1.7)	-	53 (14.9)
Fever, headache	165 (46.3)	129 (36.2)	6 (1.7)	-	56 (15.8)
Participants receiving antibiotics					
Sore throat	49 (53.8)	32 (35.2)	4 (4.4)	1 (1.1)	5 (5.5)
Cough and/or phlegm	33 (36.3)	34 (37.3)	4 (4.4)	-	20 (22.0)
Having nasal mucus	40 (44.0)	33 (36.3)	3 (3.3)	-	15 (16.4)
Fever, headache	41 (45.1)	26 (28.5)	2 (2.2)	1 (1.1)	21 (23.1)

Associations of perceived URI treatment efficacy with receiving oral antibiotics and compliance to self-care

Among participants either with sore throat, cough/phlegm, or nasal mucus, receiving oral antibiotics or not was not associated with perceived URI treatment efficacy (Table 4). Most participants reported "cured or better" regardless of receiving antibiotics (more than 90.0% of each of all symptoms, P-value > 0.05 for all three symptoms). On the other hand, compliance with self-care advice with sore throat, cough/phlegm, and nasal mucus, was significantly associated with perceived URI treatment efficacy. Participants with perfect compliance were more likely to report "cured or better" while those with imperfect compliance were more likely to

report "no changed or worse" (P-value = 0.015, 0.003, and 0.002, respectively) (Table 4).

Table 4 Associations of receiving oral antibiotics and compliance to self-care with perceived URI treatment efficacy.

Participants' symptoms	N (%) by perceived treatment efficacy*		P-value[†]
	Cured or better	Not changed or worse	
Receiving oral antibiotics			
Sore throat (n = 381)			
Receiving antibiotics (n = 86)	81 (94.2)	5 (5.8)	0.344
Not receiving antibiotics (n = 295)	285 (96.6)	10 (3.4)	
Cough and phlegm (n = 379)			
Receiving antibiotics (n = 71)	67 (94.4)	4 (5.6)	0.308
Not receiving antibiotics (n = 308)	298 (96.8)	10 (3.2)	
Nasal mucus (n = 379)			
Receiving antibiotics (n = 76)	73 (96.1)	3 (3.9)	0.392
Not receiving antibiotics (n = 303)	297 (98.0)	6 (2.0)	
Compliance to self-care advice			
Sore throat (n = 381)			
Perfect compliance (n = 274)	268 (98.1)	6 (2.2)	0.015
Imperfect compliance (n = 107)	98 (92.4)	9 (8.4)	
Cough and phlegm (n = 379)			
Perfect compliance (n = 278)	273 (98.2)	5 (1.8)	0.003
Imperfect compliance (n = 101)	92 (91.1)	9 (8.9)	
Nasal mucus (n = 379)			
Perfect compliance (n = 278)	278 (99.3)	2 (0.7)	0.002
Imperfect compliance (n = 101)	92 (92.9)	7 (7.1)	

* Participants not having the symptom at the beginning excluded.
[†] Fisher's Exact test.

Associations of prescriptions (antibiotics vs. Andrographis paniculata) with perceived URI treatment efficacy and satisfaction

Participants receiving both oral antibiotics and Andrographis paniculata reported perceived efficacy of URI treatment as "cured or better combined" in more than 95% for symptoms of sore throat, cough or phlegm, and nasal mucus with no statistical significance (Table 5).

Most participants (at least 85%) both oral antibiotics and Andrographis paniculata reported satisfaction toward URI treatment results at high and highest levels combined with no statistical significance in those with symptoms of sore throat, cough or phlegm, and nasal mucus (Table 6).

Associations of perceived URI treatment efficacy with seeking more healthcare

It was found that participants reporting "better or cured" were more likely to not seek more healthcare with statistical significance for symptoms of sore throat, cough and phlegm, and nasal mucus (P-value = 0.016, 0.018, and 0.006,

respectively). Those reporting "worse" were more likely to seek more healthcare except for nasal mucus (Table 7).

Table 5 Associations of prescriptions (antibiotics vs. Andrographis paniculata) with perceived URI treatment efficacy.

| Participants' symptoms | Perceived URI treatment efficacy, n (%) | | P-value* |
	Cured or better	The same or worse	
Sore throat (n = 221)[a]	(n = 213)	(n = 8)	0.655*
Receiving antibiotics	41 (95.3)	2 (4.7)	
Receiving Andrographis paniculata	172 (96.6)	6 (3.4)	
Cough and phlegm (n = 232)[a]	(n = 222)	(n = 10)	1.00*
Receiving antibiotics	45 (95.7)	2 (4.3)	
Receiving Andrographis paniculata	177 (95.7)	8 (4.3)	
Nasal mucus (n = 229)[a]	(n = 224)	(n = 5)	0.586*
Receiving antibiotics	44 (100.0)	0 (0.0)	
Receiving Andrographis paniculata	180 (97.3)	5 (2.7)	

[a] Participants not having the symptom at the beginning excluded..
* Fisher's Exact test.

Table 6 Associations of prescriptions (antibiotics vs. Andrographis paniculata) with satisfaction with URI treatment results.

| Participants' symptoms | Satisfaction on URI treatment efficacy, n (%) | | | P-value* |
	Highest	High	Moderate	
Sore throat (n = 221)[a]	(n = 66)	(n = 122)	(n = 33)	0.911
Receiving antibiotics	12 (27.9)	25 (58.1)	6 (14.0)	
Receiving Andrographis paniculata	54 (30.3)	97 (54.5)	27 (15.2)	
Cough and phlegm (n = 232)[a]	(n = 73)	(n = 125)	(n = 34)	0.872
Receiving antibiotics	16 (34.0)	25 (53.2)	6 (12.8)	
Receiving Andrographis paniculata	57 (30.8)	100 (54.1)	28 (15.1)	
Nasal mucus (n = 229)[a]	(n = 76)	(n = 120)	(n = 33)	0.982
Receiving antibiotics	15 (34.1)	23 (52.3)	6 (13.6)	
Receiving Andrographis paniculata	61 (33.0)	97 (52.4)	27 (14.6)	

* Chi-square test.

Table 7 Associations of perceived URI treatment efficacy with seeking more healthcare

| Perceived URI treatment efficacy | Seeking more healthcare, n (%) | | P-value[†] |
	Yes	No	
Sore throat (n = 381)*	(n = 37)	(n = 344)	0.016
Worse	2 (66.7)	1 (33.3)	
Unchanged	2 (16.7)	10 (83.3)	
Better or cured	33 (9.0)	333 (91.0)	
Cough and phlegm (n = 379)*	(n = 39)	(n = 340)	0.018
Worse	2 (100.0)	0 (0.0)	
Unchanged	1 (8.3)	11 (91.7)	
Better or cured	36 (9.9)	329 (90.1)	
Nasal mucus (n = 379)*	(n = 36)	(n = 343)	0.006
Worse	0 (0.0)	0 (0.0)	
Unchanged	4 (44.4)	5 (55.6)	
Better or cured	32 (8.6)	338 (91.4)	

* Participants not having the symptom at the beginning excluded.
[†] Fisher's Exact test.

After perceiving the URI treatment efficacy, most participants reported that since the symptoms were cured, further treatment was not sought (74.0%) (Table 8). With less proportions, 15.4% reported getting better but not completely cured, no treatment was sought and self-caring at home, and 10.6% reported seeking more treatment which was mostly from the same PCU (78.7%) and only 2.1% seeking self-medication from drugstores. For satisfaction, 85.9% reported the most and highly satisfied combined; while nobody reported no satisfaction. For practice for the future URI, most participants reported to seek care at the same PCU (94.2%) and only 1.8% reported not seeking treatment, only home self-care (Table 8).

Table 8 Healthcare seeking and practice and satisfaction of the participants after URI treatment (N = 447).

Healthcare seeking and practice and satisfaction	N	%
Practices after the treatment		
Since the symptoms were cured, further treatment was not sought	331	74.0
Since getting better but not completely cured, no treatment was sought and self-caring at home	69	15.4
Seeking more treatment from … (more than 1 place was applicable)	47	10.6
The same PCU	37	78.7
Hospital	11	23.4
Private clinic	6	12.8
Drugstore	1	2.1
Satisfaction level toward treatment results of URI		
The most satisfied	145	32.4
Highly satisfied	239	53.5
Moderately satisfied	63	14.1
Not satisfied	-	-
Highly not satisfied	-	-
Practice for future URI		
Seeking treatment and medications at the same PCU	421	94.2
Go to community hospital	95	21.3
Go to private medical clinic	55	12.3
Self-medicated with medications from drugstore	57	12.8
Not seeking treatment, only homeself-care	8	1.8

Discussions and Conclusion

Upper respiratory tract infection (URI) was the most found illness at PCUs in Chachoengsao province and Health Region 6.[20] Most participants with URI in this study had a perceived URI treatment efficacy at "cured" or "better" combined (94.0%) both in those received oral antibiotics and those who did not in all symptoms of sore throat, cough or phlegm, nasal mucus, and fever or headache.

Participants with and without antibiotics prescribed had similar perceived URI treatment effectiveness with no statistical significance for symptoms of sore throat, cough or phlegm, and nasal mucus. This finding is consistent with a previous study that URI was usually cured without antibiotics (94.3%). according to RDU guidance. The study found that as high as 94.3% and 97.2% of patients both treated according to and not according to RDU antibiotics guidance achieved "cured" or "better" perceived efficacy, respectively,

and more than 80.0% of the two groups were satisfied with the treatment results.[21] Results of our study is also consistent with an Antibiotic Smart Use (ASU) study showing that most patients had better treatment outcomes and were satisfied with the treatment.[22]

We found that compliance to advice on self-care provided by PCU healthcare providers for patients with sore throat, cough or phlegm, and nasal mucus was significantly associated with perceived URI treatment efficacy. Perception of "cured" and "better" combined was associated with perfect compliance. Advice for alleviating sore throat, cough and phlegm, and nasal mucus is consistent with the problems patients are facing and could be followed as self-care easily. Patients are advised to drink more water especially warm water, avoid cold water or ice, ware facemask, and avoid social gathering to prevention contagion.[23]

In addition, only 91 out of 447 URI participants received oral antibiotics (20.4%). Most prescribed medications for URI were antipyretics, antitussives, mucolytics, nasal decongestants, and Andrographis paniculata capsules. This 20.4% prescribed antibiotics relatively met the RDU criterion for antibiotics use in URI of not more than 20%.[7] This low criterion of antibiotics use is based on the fact that URI is a common illness which could be cured immunologically without antibiotics needed.[24] The overuse of antibiotics could also lead to microbial resistance.

Among participants prescribed with medications for URI, more than half (55.5%) received Andrographis paniculata capsules. This prescription was in accordance with RDU for primary care which emphasizes the use of Andrographis paniculata capsules in certain patients and indications. Andrographis paniculata is in National List of Essential Drugs with the indication of alleviating signs and symptoms of cold such as sore throat and achy body.[23] A systematic review shows that various clinical trials in Europe and Asia Panossian shows benefits of Andrographis paniculata for sore throat.[25] In Thailand, Andrographis paniculata 6 grams per day reduced fever and sore throat better than paracetamol with Andrographis paniculata 3 grams per day.[26] In our study, URI patients receiving antibiotics and Andrographis paniculata capsules perceived efficacy of URI treatment mostly as "cured and better" (more than 95.0% in both groups) with no significant difference and satisfied with the treatment results.

This finding offers healthcare providers more confidence in using Andrographis paniculata capsules for URI treatment.

Most participants had a high and most satisfaction level on PCU service (85.9%). They would seek healthcare for future URI (94.2%). Only those perceiving efficacy as "not changed" or "worse" would seek treatment from other places of which 75.0% or higher would seek care at the same PCU. This decision was because they were "cured" or "better" with the last URI treatment, received information and advice from the providers which helped them in self-care. It has been known that good communication in healthcare system allows patients to take good care of themselves and others which could reduce economic burden of the healthcare facilities institute and system.[22]

Results of this present study reflects the success of RDU policy implementation in Chachoengsao province. Healthcare providers in PCUs are responsible of URI treatment as guided by RDU policy with a limited antibiotics prescription, advice for self-care, and herbal medicines replacing conventional medicines. With the expected patient outcome of URI cure, patients are satisfied with the service. The results also indicate the sustainability URI treatment service development at PCUs up to the standards. The providers also have to provide advice and information on medications and self-care so appropriate antibiotics use could be achieved.

This study has certain limitations. The perceived efficacy of URI treatment results was subjective, not the objective outcome. More objective clinical outcome should be used to make results more reliable. Data of diagnosis and treatment of URI of some patients were retrospective. Data on perceived URI treatment efficacy was based on recall of the past 1 – 6 months, information could be affected by recall bias. Concurrent and prospective data could offer more complete and reliable information.

Results of the study could be useful in practice. Healthcre providers at PCUs should prepare and provide the URI patient relevant information for self-study at their convenience. Healthcare providers could be more confidence in not prescribing antibiotics since URI perceived treatment efficacy was comparable regardless of prescribed antibiotics.

For future research, more objective clinical measures should be used to gain more reliable outcomes in URI treatment instead of the perception. Factors affecting the perception on URI treatment should be studied including signs and

symptoms of URI, other clinical problems both infectious and non-infectious illnesses, intra-personal factors such as knowledge about URI, URI prevention and control, and beliefs according to Health Belief Model and self-efficacy, and external factors such as information and advice dissemination on self-care, and social support from healthcare providers and family members.

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