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Review

Pharmacist interventions in managing minor illnesses with non-prescription medicines: A systematic review

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This study was carried out to evaluate the outcomes of pharmacist interventions in managing minor illnesses with non-prescription medicines. The Embase, LILACS, PubMed, Scielo, EBSCO and Scopus databases were searched for articles published from 1980 through December, 2010 with the search terms "minor ailments," "minor illness," "pharmacist," "self-medication," "pharmacist's role," "self limiting conditions," "community pharmacies," "over-the-counter," "pharmacy information" and "non-prescription drug." The inclusion criteria were research conducted in community pharmacies, consumers of non-prescription medicines for the management of minor illness, pharmacist intervention for management of minor illness with non-prescription medicines and presence of questions that indicate management of minor illness. The initial search identified 1,290 publications. Of these, only 9 met our inclusion criteria. None of the articles defined minor illness and non-prescription drugs. Only 4 (44.4%) made any reference to pharmacist intervention. The most common pharmacist intervention was non-prescription drugs. Most of the studies evaluated pharmacist actions in providing appropriate care to consumers seeking non-prescription treatment for minor illness, the level of patient adherence and the impact of pharmacist counseling on the patient's complaint. However, this research revealed that pharmacist interventions were scarce and even the articles that deal with this verified a lack of practical measures that indicate their impact.

Key words: Pharmacist's intervention, non-prescription medicines, community pharmacist, minor illness.

INTRODUCTION

A study established that 80% of medical symptoms were self-recognized and self-treated without healthcare professionals' involvement (Sobel, 2003). According to Shoemaker and Oliveira (2008) this behavior, called self-care, results from natural survival instinct. Levin et al. (1997) defined self-care as "a decision-making process which involves self- observation, symptom perception and labeling, judgment of severity and choice and assessment of treatment options."

Self-medication is a necessary part of healthcare systems.

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It is a form of self-care in which patients assess the severity of illness and the outcomes expected from non-prescription medicines' treatment (Volmer et al., 2007). Worldwide, the management of minor illness by self-medication is a common practice, as patients are taking more interest and feel more confident in managing their own health and drug therapy (Parmentier et al., 2004; Wazaify et al., 2005; Schulz et al., 2006; Grigoryan et al., 2006; Chin-Quee et al., 2006; Noyce, 2007; Pumtong et al., 2008; Hanna and Hughes, 2009).

Although the advent of medication use is one of the most significant contributions to increased life expectancy, medication-related problems, that is, negative clinical outcomes resulting from the medication use (or lack of use), are a greater contributor to burden of disease (Llimós and Faus, 2003). An example of negative clinical outcomes is the acetaminophen, recognized as a safe and effective non-prescription analgesic and antipyretic, it is also associated with significant morbidity and mortality (hepatotoxicity) when doses in excess of the therapeutic amount are ingested inappropriately (Krenzelok and Royal, 2012). An estimated 78,414 emergency department visits for the treatment of acetaminophen overdose occur annually in the United States (Budnitz et al., 2011). According to Major and Vincze (2010), the risks associated with non-prescription medicines could be particularly great because consumers do not normally follow up with their pharmacist.

In consequence, the World Health Organization (1998) proposed guidelines for healthcare professionals, including pharmacists, specifically intended to minimize the risk of inappropriate medication use, primarily non-prescription medicines (WHO, 1998; Ernst and Grizzle, 2001). In recent decades, the literature had reported that pharmacists have clinical skills and have made pharmacotherapy interventions to help patients choose adequate non-prescription medicines (NPA, 1989; Van Duong et al., 1997; Ernst and Grizzle, 2001; Philips et al., 2001; Sobel, 2003; Marklund et al., 2003; Westerlund et al., 2003; Wazaify et al., 2005; Chin-Quee et al., 2006; Qidwai et al., 2006; Noyce, 2007; Westerlund et al., 2007; Smith, 2009; Vella et al., 2009; Major and Vincze, 2010; Holtmann et al., 2011; Kagashe et al., 2011; Hussain and Ibrahim, 2012; Minh et al., 2013). The present study aimed to evaluate the outcomes of pharmacist interventions in managing minor illnesses with non-prescription medicines.

MATERIALS AND METHODS

A systematic review was conducted according to Cochrane methodology (Higgins and Green, 2006). Six databases were searched: Embase, LILACS, PubMed, Scielo, EBSCO, and Scopus. Articles published from January, 1980 through December, 2010 were searched using different combinations of the following terms: "minor ailments", "minor illness", "pharmacist", "self-medication", "pharmacist's role", "self limiting conditions", "community pharmacies", "over-the-counter medication", "pharmacy information", and "non-prescription drug". Articles indexed in multiple databases were considered only once. The inclusion criteria were as follows: (1) research conducted in community pharmacies, (2) consumers of non-prescription medicines for the management of minor illness, (3) pharmacist intervention for management of minor illness with non-prescription medicines, and (4) the presence of questions that indicated management of minor illness and/or decision making about the supply of non-prescription medicines. Letters to the editor, congress publications, systematic reviews, meta-analyses, articles not written in English, articles without abstracts or full text available in the databases or by the article authors, patient preferences for non-prescription medicines and attitude about minor illness, articles focusing exclusively on medicine, and only provision of medicines (without counseling) were excluded from this review. Studies evaluating pharmacist intervention and presenting results obtained by pharmacy staff without specifying the results of pharmacist intervention (data stratification or other statistical method) were also excluded. The selection process comprised 3 phases. The manual screening of titles (phase 1) and then abstracts (phase 2) was performed by two independent reviewers (MLB and CER). The selected articles were then manually reviewed (phase 3) by the same reviewers of phase 1 and 2 and included or excluded based on the previously mentioned criteria. Any disagreement during phases 2 and 3 were resolved at a meeting where abstracts and articles were analyzed regarding the presence of the inclusion criteria and subsequently included or excluded from the systematic review (MLB, CER and DPLJ). The rate of agreement between the two reviewers before and after consensus was assessed by the kappa coefficients (κ). If the reviewers could not reach a consensus, a third independent reviewer (DPLJ) resolved the disagreement.

The reviewers independently abstracted critical information from selected articles, including (1) study setting; (2) sample size (community pharmacy), participant and participant age; (3) reference to minor illness; (4) reference to pharmacist intervention; (5) reference to non- prescription medicine; (6) study design; (7) duration of the study and pharmacists' consultations; (8) minor illness managed; (9) non-prescription medicines used; (10) most common questions pharmacists asked; (11) type of pharmacist intervention; (12) criteria for pharmacists' decision to recommend a non- prescription medicines; (13) reasons for referring a consumer to a medical practice or other services; (14) patient adherence to the pharmacist's advice; (15) outcomes after pharmacist intervention; and (16) study limitations.

In this study, pharmacist intervention outcomes were identified through the attitudes of pharmacists involving the evaluation of patient complaints and indication of a pharmacological or non-pharmacological treatment that would modify the patient clinical condition (stabilization, improvement or worsening of the complaint). Minor illness was considered, according to Gray et al. (2002) a self-limiting condition, for example, a cold, which does not require referral to a clinician or other health professional. Non-prescription medicines was defined, in this study, as drugs that do not need a doctor's prescription and are used in minor illness treatment or self-limiting conditions (Wertheimer and Serradell, 2008). Finally, patient adherence to pharmacist's advice was identified as patient spontaneous acceptance of pharmacist recommendations that included, for example, non-pharmacological treatment, medical consultation and concordance with pharmaco-therapy. The preferred reporting items of systematic reviews and meta-analyses (PRISMA) statement were used to make a flow chart of the selection process (Moher et al., 2009).

RESULTS

Figure 1 summarizes the systematic review strategy. The

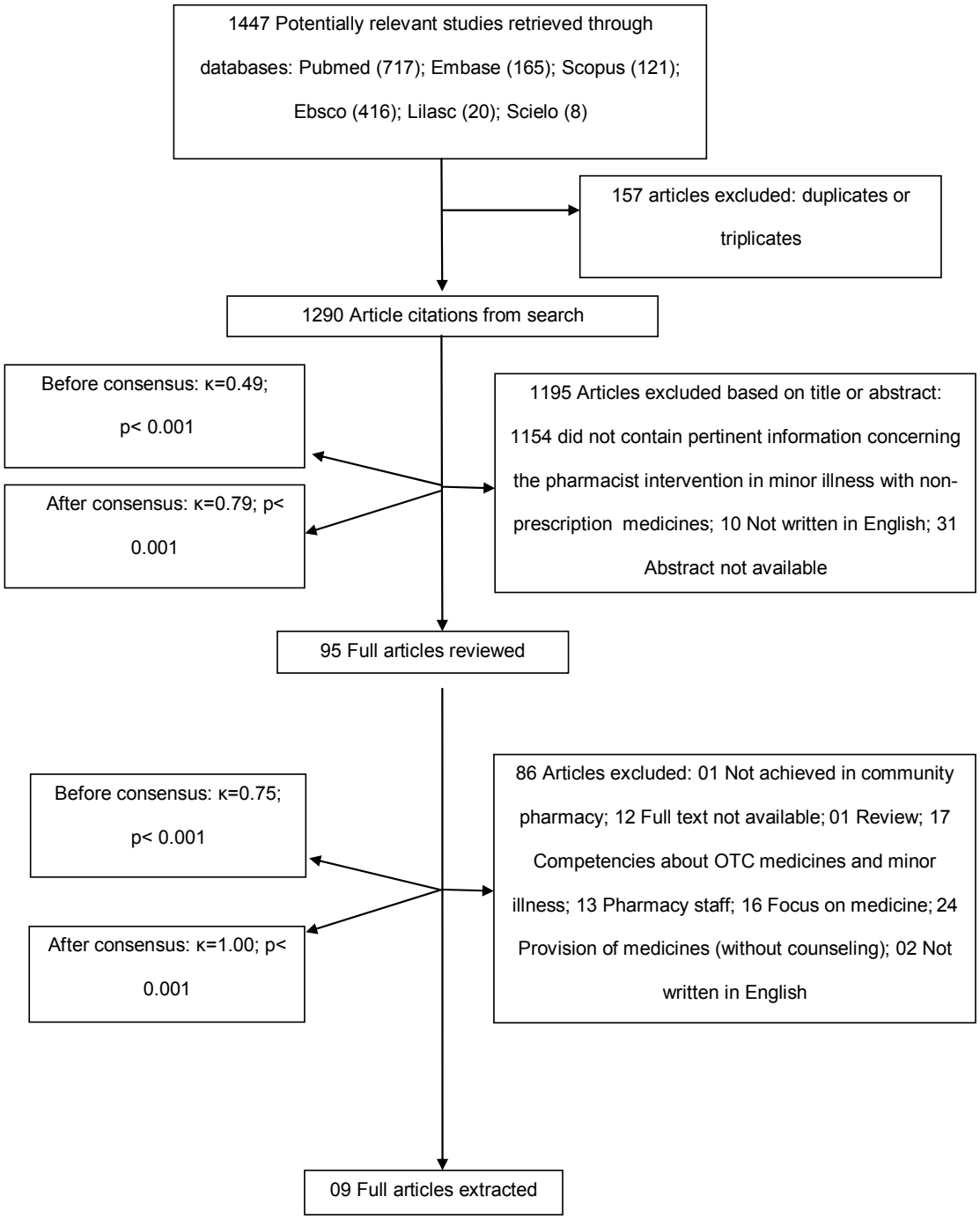

Figure 1. Study selection flowchart through literature search.

kappa calculated in phase 2, after consensus, indicates substantial agreement (κ = 0.79; p < 0.001) between our 2 reviewers (Figure 1). A total of 95 articles were pre-selected for full-text review and 86 of these were excluded: 12 because the full text, after exhaustive search, was not available in the databases or because they were not provided by the article authors and 74 because they did not meet the inclusion criteria. Perfect agreement (κ = 1.00; p < 0.001) between our 2 reviewers was found in phase 3, after consensus (Figure 1). Nine articles comprised the final data set (Berih et al., 1989; Krishnan and Schaefer, 2000; Westerlund et al., 2003; Rutter et al., 2004; Chui and Li, 2005; Alte et al., 2007; Driesen and Vandenplas, 2009; Mehuys et al., 2009; Saengcharoen and Lerkiatbundit, 2010). Table 1 describes the characteristics of these selected studies in

Table 1. General characteristics of studies (n = 9) included in the systematic review (community pharmacy settings).

Reference	Country	Participants	Sample size	Period (month)	Pharmacists' consultation duration (min)
Berih et al. (1989)	Sudan	Pharmacist/Simulated clients	63	01	NR[a]
Krishnan et al. (2000)	Germany	Pharmacist/Patients	36, SC[b]=15; CG[c]=21	07	NR[a]
Westerlund et al. (2003)	Sweden	Pharmacist/Patients	06	01	NR[a]
Rutter et al. (2004)	England	Pharmacist/Simulated clients	36	02	NR[a]
Chui et al. (2005)	Singapore	Pharmacists/Patients	44	01	<10
Alte et al. (2007)	German	Pharmacist/Simulated client	146	01	NR[a]
Driesen et al. (2009)	Belgium	Pharmacist/Simulated client	101	01	1.5 - 19
Mehuys et al. (2009)	Belgium	Pharmacist/Patients	NR[a]	06	NR[a]
Saengcharoen et al. (2010)	Thailand	Pharmacy personnel	115	NR[a]	NR[a]

[a]NR= not reported; [b]SG= study group; [c]CG= control group.

detail.

Almost all of the studies analyzed (8/9; 88.9%) were published in pharmacy journals (Krishnan and Schaefer, 2000; Westerlund et al., 2003; Rutter et al., 2004; Chui and Li, 2005; Alte et al., 2007; Driesen and Vandenplas, 2009; Mehuys et al., 2009; Saengcharoen and Lerkiatbundit, 2010). The studies were conducted primarily in Europe (6/9; 66.7%) (Krishnan and Schaefer, 2000; Westerlund et al., 2003; Rutter et al., 2004; Alte et al., 2007; Driesen and Vandenplas, 2009; Mehuys et al., 2009) and Asia (2/9; 22.2%) (Chui and Li, 2005; Saengcharoen and Lerkiatbundit, 2010). Participants in 4 (44.4%) studies were simulated patients and pharmacist (Berih et al., 1989; Rutter et al., 2004; Alte et al., 2007; Driesen and Vandenplas, 2009) in the practice setting. The simulated patient age was reported in 2 studies and the age ranged from 26 to 55 (Berih et al., 1989; Driesen and Vandenplas, 2009). Concerning community pharmacies sample size, the reviewed studies presented the ranged from 6 (Westerlund et al., 2003) to 146 (Alte et al., 2007) and more than half of the studies (6/9; 66.7%) had community pharmacies samples smaller than 100 (Westerlund et al., 2003; Berih et al., 1989; Krishnan and Schaefer, 2000; Rutter et al., 2004; Chui and Li, 2005; Saengcharoen and Lerkiatbundit, 2010). Only 5 (55.5%) of the articles reviewed included a sample size calculation (Alte et al., 2007; Saengcharoen and Lerkiatbundit, 2010) or presented the sampling method (Westerlund et al., 2003; Rutter et al., 2004; Driesen and Vandenplas, 2009). The length of study period duration was shorter than 3 months (6/9; 66.7%) (Westerlund et al., 2003; Berih et al., 1989; Rutter et al., 2004; Chui and Li, 2005; Alte et al., 2007; Driesen and Vandenplas, 2009) or greater than or equal to 6 months (Krishnan and Schaefer, 2000; Mehuys et al., 2009), and 1 study did not report this information (Saengcharoen and Lerkiatbundit, 2010). The amount of time the pharmacist spent dispensing medicines was reported in only 2 articles (1.5 and 19 min) (Chui and Li, 2005; Driesen and Vandenplas, 2009).

None of the articles in the sample pointed out what would be considered as minor illness and non-prescription medicine (Berih et al., 1989; Krishnan and Schaefer, 2000; Westerlund et al., 2003; Rutter et al., 2004; Chui and Li, 2005; Alte et al., 2007; Driesen and Vandenplas, 2009; Mehuys et al., 2009; Saengcharoen and Lerkiatbundit, 2010) (Table 2). Only 4 (44.4%) made any reference of what would be considered as pharmacist intervention (Krishnan and Schaefer, 2000; Alte et al., 2007; Driesen and Vandenplas, 2009; Mehuys et al., 2009). The most common minor illness managed was gastrointestinal symptoms (8) (Berih et al., 1989; Westerlund et al., 2003; Krishnan and Schaefer, 2000; Rutter et al., 2004; Driesen and Vandenplas, 2009; Mehuys et al., 2009; Saengcharoen and Lerkiatbundit, 2010) and 5 of those were upper gastrointestinal symptoms (Krishnan and Schaefer, 2000; Westerlund et al., 2003; Rutter et al., 2004; Chui and Li, 2005; Mehuys et al., 2009). Three studies described antacids as the non- prescription medicine recommended by the pharmacist (Westerlund et al., 2003; Rutter et al., 2004; Mehuys et al., 2009). It was also noted that of the 9 studies analyzed, only 4 (44.4%) (Krishnan and Schaefer, 2000; Westerlund et al., 2003; Chui and Li, 2005; Mehuys et al., 2009) reported patient adherence to the pharmacist's advice.

Table 2 Definition of minor illness (MI), pharmacist intervention (PI) and non- prescription medicine (NPM), type of MI managed, and NPM advice and characteristic of patient's adherence to the pharmacist's advice in the studies reviewed (n=09).

Reference	MI definition	PI definition	NPM definition	MI managed	NPM advice	Patient's adherence to the pharmacist's advice
Berih et al. (1989)	NR[a]	NR[a]	NR[a]	Acute diarrhoea	ORS[b], and antidiarrhoeal	NA[c]
Krishnan et al. (2000)	NR[a]	Yes	NR[a]	Dyspepsia	NR[a]	Yes
Westerlund et al. (2003)	NR[a]	NR[a]	NR[a]	Dyspepsia	Antacids, sodium alginate, histamine H2 -receptor antagonists, and proton-pump inhibitors	Yes
Rutter et al. (2004)	NR[a]	NR[a]	NR[a]	Headache and abdominal discomfort	Acetaminophen, codeine phosphate, buclizine, pseudoephedrine, H2 -receptor antagonists, antacids, and bismuth subsalicylate	NA[c]
Chui et al. (2005)	NR[a]	NR[a]	NR[a]	Cough, gastric discomfort, cold and skin irritations	NR[a]	Yes
Alte et al. (2007)	NR[a]	Yes	NR[a]	Headache	Aspirin, ibuprofen, acetaminophen, caffeine, and ascorbic acid	NA[c]
Driesen et al. (2009)	NR[a]	Yes	NR[a]	Acute diarrhoea	*Saccharomyces boulardii, Lactobacillus acidophilus*, smectite, domperidone, lactose-free milk, and food supplements	NA[c]
Mehuys et al. (2009)	NR[a]	Yes	NR[a]	Upper GI symptoms	Domperidone, and antacid	Yes
Saengcharoen et al. (2010)	NR[a]	NR[a]	NR[a]	Acute diarrhoea	Pectin, kaolin, ORS[b], and antimotility	NA[c]

[a]NR= not reported; [b] ORS= oral rehydration solution; [c] NA= not applicable.

The type of study was shown in 6 (66.7%) of our sample (Krishnan and Schaefer, 2000; Rutter et al., 2004; Chui and Li, 2005; Driesen and Vandenplas, 2009; Mehuys et al., 2009; Saengcharoen and Lerkiatbundit, 2010) and of those, 1 (16.6%) used qualitative methods (Rutter et al., 2004) (Table 3). Eight studies thoroughly documented the questions community pharmacists asked patients with minor illness (Krishnan and Schaefer, 2000; Westerlund et al., 2003; Rutter et al., 2004; Chui and Li, 2005; Alte et al., 2007; Driesen and Vandenplas, 2009; Mehuys et al., 2009; Saengcharoen and Lerkiatbundit, 2010); 6 indicated the reasons for referring patients to a medical practice or other services (for example, contraindications to self-treatment, serious illness, or current medication use) (Table 3) (Krishnan and Schaefer, 2000; Westerlund et al., 2003; Rutter et al., 2004; Alte et al., 2007; Driesen and Vandenplas, 2009; Mehuys et al., 2009; Saengcharoen and Lerkiatbundit, 2010).

Regarding criteria for recommending non-prescription medicine, pharmacists in 5 studies assessed previous use of these medicines (Westerlund et al., 2003; Alte et al., 2007) or minor illness symptoms (Chui and Li, 2005; Driesen and Vandenplas, 2009; Mehuys et al., 2009). In this review, 10 different types of pharmacist intervention were identified and there was more than 1 intervention in each study (Table 4) (Berih et al., 1989; Krishnan and Schaefer, 2000; Westerlund et al., 2003; Rutter et al., 2004; Chui and Li, 2005; Alte et al., 2007; Driesen and Vandenplas, 2009; Mehuys et al., 2009; Saengcharoen and Lerkiatbundit, 2010). Positive outcomes included patient satisfaction (3) (Westerlund et al., 2003; Krishnan and Schaefer, 2000; Chui and Li, 2005). The most often limitations cited for the articles reviewed were non- respondent bias and/or the reason (2) (Rutter et al., 2004; Mehuys et al., 2009), and lack of measurement of inter and intra-

Table 3. Methodological description of the studies (n = 9) included in the systematic review.

Reference	Type of Study	Questions Asked	Reasons to Refer to Medical Practice or Other Services	Criteria to Indicate non- prescription medicines	Positive Outcomes	Declared Limitations
Berih et al. (1989)	NR[a]	Symptoms	NR[a]	NR[a]	↓ antimicrobial use	NR[a]
Krishnan et al. (2000)	Randomized controlled trial	How long do the symptoms exist; the character and the severity of the symptoms; prior and current medication use; which actions already has taken; other medical problems	Direct Referral[b] and conditional referral[c]	NR[a]	↑ Patient satisfaction with the pharmacist's services in self-medication	Sample size, Hawthorne effect, selection and response bias, unexplored the nature, the possible causes and the implications of the symptoms
Westerlund et al. (2003)	NR[a]	Is this the first time you have suffered from these symptoms? Do you have difficulty swallowing? Do you have dyspepsia symptoms daily? For how long have you had the symptoms? Are you currently using nonprescription or prescription painkillers?	Nearly daily problems for more than 3 weeks, difficulty swallowing, onset of dyspepsia symptoms after 45 years of age, and taking aspirin or NSAID[d]	Will you use this medication yourself? Have you used this medication before? How have you used this medication? How well do you think the medication has worked? For what ailments have you used, or do you intend to use, the medication?	↑ patient satisfaction with the visit to the pharmacy ↑ relief of dyspepsia symptoms	Not define advice
Rutter et al. (2004)	Participant observation	Duration of the symptoms, nature and location of the pain, the presence of other symptoms, previous medical history, specific causes of the symptoms, aggravating or precipitating factors, pregnancy, previous medication tried (prescribed or purchased)	Previous episodes, duration of the symptoms, suspicious ADR[e], symptom better treated by a doctor	NR[a]	Questions focus in general value of the symptom	Pharmacists refused interview, not measure interobserver variabilities, results not be generalized to other scenarios or pharmacist practicing in the same or other countries or practicing on another day
Chui et al. (2005)	Cross-sectional	For whom the medication would be used and the age of the user, duration and characteristic of the symptoms, previous medical history and medication tried (prescribed or purchased)	NR[a]	Whether the symptoms could be relieved by the use of an OTC product	↑Patient satisfaction pharmacists' consultation Appropriate pharmacist information based on effectiveness and safety	Not document the intervention by the pharmacists

Table 3. *Contd.*

Alte et al. (2007)	NR[a]	Duration, frequency, characteristic and nature of the symptoms, the presence of other symptoms, previous medical history, specific causes of the symptoms, aggravating or precipitating factors, medical consulting	Whether the headache persisted	Previous medication tried (prescribed or purchased), allergy, pregnancy, and breast-feed	Consultation offered without request. ↑professional status→ ↑ consultation quality (Appropriate pharmacist information based on effectiveness and safety)	Not measure inter- and intra-observer variability, not compare the extent of consultation, Hawthorne effect
Driesen et al. (2009)	Observational	The age of the patient, identification, nature and duration of the symptoms, actions, previous medication tried	Presence of severe dehydration, high fever, persistent vomiting, and uncertainty of diagnosis	Prevention and treatment of dehydration- oral rehydration solution, breast feeding, or normal feeding, S.b.[f] by about 24 h	↑pharmacist's advice related to dehydration and dietary (questions focus in general value of the symptom)	Not guarantee the quality of pharmacy services, not generalized results, not distinguish between pharmaceutical technicians and pharmacists
Mehuys et al. (2009)	Descriptive	Nature, frequency, duration, and presence of alarm symptoms, medical consulting, and medication use over the previous 12 months	Currently using aspirin, NSAIDs[d], or PPIs[g], and/or presenting with one or more alarm symptoms, and/or aged 50 years or older with recent-onset complaints	Dyspeptic symptoms NPA[h] and 10 mg domperidone 20 min before each meal Heartburn symptoms and dyspeptic symptoms – NPA[h] antacid plus domperidone	↑patient adherence to the pharmacist's referral advice ↑symptom relief with NPM use. ↑Patient adherence to the pharmacist's NPA[h]	Selection bias, not record the number of refusal and the reason, not measure the appropriateness of the referral decisions of the pharmacist, not check the necessity of the medical consultation
Saengcharoen et al. (2010)	Questionnaire survey	The age of the patient; characteristics and frequency of stool; duration of, severity of, and associated symptoms; specific causes of the symptoms; dehydration-related symptoms; chronic diseases; and previous and/or current medication tried	NR[a]	NR[a]	↑Pharmacist's belief on NPM effect	Differences between SCs in performing and/or recording the information of the encounters, not generalized results, discrepancy related to the pharmacy personnel who fill in the questionnaires

[a]NR = not reported; [b]Defined as any verbal interaction between staff and customers, where they recommend the customer to immediately visit a doctor; [c]Defined as any verbal interaction between staff and customers, where they recommend the customer to see a doctor if the complain persisted after self treatment; [d]NSAID = non-steroidal anti-inflammatory drugs; [e]ADR= adverse drug reaction; [f]S.b.= *Saccharomyces boulardii*; [g]PPI = proton-pump inhibitors; [h]NPA = non-pharmacologic advice.

observer variation (2) (Rutter et al., 2004; Alte et al., 2007) (Table 3).

DISCUSSION

In practice, patients often go directly to community pharmacies and obtain medicines for their minor illness. Consequently, researchers need to recognize tools for implementing new counseling practices for the development of community pharmacist competency, as well as ensure that the medication supplied was indicated, effective and safe for the patient clinical condition (Basak and Sathyanarayana, 2010). Many of the suggestions for future research thus far lead us to explore the clinical and consultation skills pharmacists require, for example, diagnosis and treatment of self-limiting conditions knowledge, clinical pharmacy

Table 4. Types of pharmacist interventions of the studies (n = 9) included in the systematic review.

Pharmacist intervention	Frequency	%
Indication of an NPM	7	26.9
Physician referral	7	26.9
Indication of a non-drug approach	2	7.69
Indication of antimicrobial	2	7.69
Indication of oral rehydration solution	2	7.69
Dietary advice	2	7.69
Information concerning general health advice	1	3.84
Information about lifestyle changes	1	3.84
Information about product	1	3.84
Information about treatment	1	3.84

pharmacy and therapeutics education, participation in clinical practice, structuring of clinical decision-making and communication skills (WHO, 2012). Innovations in pharmacy practice tend to be reported in specialist journals, however, interdisciplinary collaboration among researchers and community pharmacists is essential.

Most of the studies we reviewed were conducted in Europe; we found no research from North America that met the inclusion criteria. The role of the pharmacist in the treatment of minor illness with non- prescription medicines in the US is different from the practice model in Europe (CHPA, 2012; CHPA, 2013; Nissen, 2011). It should be noted that pharmacy associations in the US also campaign for continuing education of community pharmacists and for pharmacists supplying of non-prescription medicines. To note one example, the American Pharmacist Association (APhA) offers a multi-module training program for pharmacists on advising patient's about over-the-counter products called Over the Counter (OTC) Advisor® and has also campaigned for a new drug class called "Pharmacist Care OTC" that would require patients to interact with a pharmacist to obtain certain OTC medications (APha, 2013). Future studies should focus on collecting information about community pharmacy practice, such as evidence-based self-care advice and investigating effective follow-up methods.

Few studies presented a sample size calculation (Alte et al., 2007; Saengcharoen and Lerkiatbundit, 2010) or the sampling method (Westerlund et al., 2003; Rutter et al., 2004; Driesen and Vandenplas, 2009) and there was variation in sample size (Berih et al., 1989; Krishnan and Schaefer, 2000; Westerlund et al., 2003; Rutter et al., 2004; Chui and Li, 2005; Alte et al., 2007; Driesen and Vandenplas, 2009; Saengcharoen and Lerkiatbundit, 2010). The absence of sample size calculations prevent us from detecting important effects of pharmacist interventions (Krishnan and Schaefer, 2000; Driesen and Vandenplas, 2009) and compromise the statistical power of the study and the validity of the results (Chadha, 2006). Participants had different roles (pharmacist, simulated patients, and patients) with broad age ranges (Berih et al., 1989; Westerlund et al., 2003; Rutter et al., 2004; Chui and Li, 2005; Alte et al., 2007; Driesen and Vandenplas, 2009; Mehuys et al., 2009; Saengcharoen and Lerkiatbundit, 2010). Participant age should be included in future studies, whether patients or simulated patients are involved, because different minor illness affect distinct age groups. For example, younger patients typically needed information of their acute and minor illness, and elderly patients needed information more about chronic major diseases such as cardiovascular or respiratory (Kansanaho et al., 2002).

The effectiveness of pharmacist intervention was not related to the length of study period duration, but to characteristics of the design and expected outcomes. Some studies focused on follow-up and measured the impact of pharmacist intervention (Krishnan and Schaefer, 2000; Westerlund et al., 2003; Mehuys et al., 2009). Nevertheless, the advice given about medicine had a positive outcome (for example, relief of patient dyspepsia symptoms, patient satisfaction with the visit to the pharmacy or with pharmacists' consultation, patient adherence to the pharmacist's referral advice); usually, 1 encounter was not enough to demonstrate the full scope of pharmacist counseling (Aguiar et al., 2011). Researchers should develop more studies with two or more pharmacist encounter to understand and measure the improvement on patient health, for example relief of patient complaint. These studies should use artifices like future discounts on medicines purchase or telephone contact with the patient in order to inform the pharmacist about the effect of the proposed intervention.

To recommend properly a non-prescription medicine for a patient, pharmacist requires adequate time for gathering clinically relevant information and evaluating the need for the medicine. The literature advocates that pharmacists designate at least 3 min per patient (Oh et al., 2002). Future researchers should consider not only the duration of pharmacist-patient interaction, but also the quality and scope of information exchange and patients'

understanding of this information. Investigators who are experienced in qualitative research can fill these crucial gaps in our understanding of pharmacist intervention.

Although the scope of self-medication is increasing, which encourages patients to seek out community pharmacies, worldwide understanding of minor illness is not uniform. When a study does not clearly define minor illness, this may lead to different interpretations of the results; the impact of pharmacist intervention may not be measured. It is important that researchers standardize the definition of minor illness, because this would facilitate the exchange of pharmacist intervention data and influence continuing education. Likewise, few studies defined pharmacist intervention. The literature defines "intervention" as any activity that changes a patient's treatment (Cordina et al., 1998). Researchers need to understand what kind of activities would be investigated to assess the real impact of pharmacist intervention at a community pharmacy. Again, documentation (including audio and video recordings) could be a relevant indicator of the quality and extent of pharmacist intervention.

Although a number of studies specified the non-prescription medicines supplied, none of them defined the term non-prescription medicines. Non-prescription medicines are medications bought by patients without a physician's prescription. Studies have shown that self-care might empower patients to become responsible users of medications obtained after suitable counseling and education (Shoemaker and Oliveira, 2008). Examining patient experience with the minor illness and non-prescription medicines will help future investigators in planning management strategies; understanding the effect of new information on patient experience; and understanding how partnerships influence the patient's adherence to the pharmacist's advice (Shoemaker and Oliveira, 2008).

Some articles did not report the study design (Berih et al., 1989; Westerlund et al., 2003; Alte et al., 2007), and several studies reported quantitative (Krishnan and Schaefer, 2000; Chui and Li, 2005; Driesen and Vandenplas, 2009; Mehuys et al., 2009; Saengcharoen and Lerkiatbundit, 2010) and qualitative (Rutter et al., 2004) methods. The selection of one design over another depends on the research question, concerns about validity and efficiency, practical and ethical considerations and expected outcomes (Aschengrau and Seage, 2008). Future study designs must address how problems will be described and quantified and whether associations between variables will be assessed. Qualitative techniques, such as focal group, in-depth interviews and participant observation, could help future researchers comprehend patients' perception/understanding/ interpretation of the minor illness, and their experience managing medication (Shah and Chewning, 2006; Aschengrau and Seage, 2008). Similarly, methods like simulated patients or the theory of planned behavior might also be used in these investigations, depending upon the type of study being performed (Berih et al., 1989; Rutter et al., 2004; Alte et al., 2007; Driesen and Vandenplas, 2009; Saengcharoen and Lerkiatbundit, 2010).

As noted in this review, only Berih et al. (1989) did not use questions to gather evidence and explain the minor illness presented. Other studies showed that tools like mnemonic questions, clinical protocols, algorithms and software can also facilitate responsible self-medication (Krishnan and Schaefer, 2000; Westerlund et al., 2003; Driesen and Vandenplas, 2009; Mehuys et al., 2009). Watson et al. (2002) showed that educational strategies were important to optimize management of minor illness. Also, a stringent law enforcement component, peer influence, including education for people on the perils of irrational use of medicines as a result of poor pharmacy prescription, needs to be further studied and addressed (Chuc et al., 2002; Pham et al., 2013). Therefore, in future studies it will be important to explore the effectiveness of training or tools used by pharmacists to manage minor illness and reduce health risks.

Several criteria were reported as relevant to pharmacists' decisions to refer patients to medical practices or other services. According to Hassell and colleagues, pharmacists were considered a "filter" to the general practitioner: someone who could advise a visit to the doctor if necessary (Hassell et al., 1997). This is probably because pharmacists can assess the severity of the complaint and risk factors (Krishnan and Schaefer, 2000; Westerlund et al., 2003; Rutter et al., 2004; Alte et al., 2007; Driesen and Vandenplas, 2009; Mehuys et al., 2009). Although these competencies do qualify pharmacists to provide treatments or referrals, studies do not address whether pharmacist referral to medical consultation is indeed necessary for a particular patient (Berih et al., 1989; Krishnan and Schaefer, 2000; Westerlund et al., 2003; Rutter et al., 2004; Chui and Li, 2005; Alte et al., 2007; Driesen and Vandenplas, 2009; Saengcharoen and Lerkiatbundit, 2010). In the future, researchers need to design studies that consider medical opinions about community pharmacist intervention.

One of the key findings of this study was that pharmacists selected non-prescription medicines based on protocols or the patient's previous experiences with the medicine (Westerlund et al., 2003; Chui and Li, 2005; Alte et al., 2007; Driesen and Vandenplas, 2009; Mehuys et al., 2009). Protocols provide guidance to help pharmacists ascertain the need for the medication and provide individualized advice (NPA, 1989; Krishnan and Schaefer, 2000; Emmerton, 2009). Ideally, a pharmacist's decision to recommend non-prescription medicines should be evidence based and lead to safe and effective treatment (Krishnan and Schaefer, 2000). Future researchers can explore the utility of treatment protocols and guidelines at community pharmacies.

The type of pharmacist intervention varied considerably, probably because of the different minor illness presented. "Appropriate self-care advice" was defined as

"the correct product and advice for the actual symptom, based on relevant questions by the pharmacy practitioner (Holtmann et al., 2011). Future studies would enable us to understand how pharmacist intervention changed the natural course of a disease. However, to better understand and measure the impact of pharmacist counseling on self-medication outcomes, such studies must include a follow-up phase.

Positive outcomes were reported, including patient satisfaction with the pharmacist's services (Krishnan and Schaefer, 2000; Westerlund et al., 2003; Chui and Li, 2005) and symptom relief (Westerlund et al., 2003; Mehuys et al., 2009). However, researchers cannot prove whether these positive outcomes are related to use of the non-prescription medicines or adherence to pharmacist advice (Berih et al., 1989; Rutter et al., 2004; Chui and Li, 2005; Alte et al., 2007; Driesen and Vandenplas, 2009). Because of the ongoing changes in healthcare systems, it is essential that researchers not ignore the role of the pharmacist in promoting health and preventing disease (Awad and Abahussain, 2010). Thus, research about pharmacist intervention for minor illness might include follow-up. Again, a qualitative approach to investigation of pharmacist counseling in self-medication might demonstrate that pharmacist's involvement improves patient health.

The inter-observer and intra-observer variability could not be measured in some studies because more than 1 simulated patient was included (Rutter et al., 2004; Alte et al., 2007). Variation in measurements could arise from various sources. In particular, an observer (that is, simulated patient) could fail to repeat his or her own measurements when carrying out successive observations (that is, simulations), or there may be disagreement between observers (Bland and Altman, 1996). Measurements may vary with choice of technique or with time. Future researchers could explore standardization of patient simulations to guarantee the reproducibility of measurements; long-term role-playing workshops could be conducted to standardize behavior during the interaction and minimize variability. Some authors assert that to reduce differences in how information obtained by simulated patients is recorded, video and audio records could be adopted (Weiss et al., 2010). Ethical issues related to consent of the pharmacist must be considered in this regard. Future researchers must not ignore the limitations of simulated patients, even if the same examiner and measuring techniques are used. Furthermore, these aspects are not applicable to studies intended to simulate different scenarios and symptoms.

Studies must distinguish between pharmacists and other pharmacy personnel to avoid reporting inaccurate results (Driesen and Vandenplas, 2009; Saengcharoen and Lerkiatbundit, 2010). Equally, the advice concept lack was also a limitation found (Westerlund et al., 2003). These limitations are important because they influence quality outcomes and could generate interview bias. Other reported limitations relate to the pharmacist's understanding of the necessity of referral and medical consultation (Mehuys et al., 2009), the extent of their consultation (Alte et al., 2007) and the quality of their service (Driesen and Vandenplas, 2009). In future studies, these topics might be addressed with qualitative and quantitative approaches.

The present study is not without limitations. Firstly, the use of other relevant keywords, such as ''pharmacist counseling'', ''patient consultation'', ''pharmacist recommendation'', "simulated patient", "mystery shopping" may have yielded a larger sample. Xu et al. (2012) reviewed studies that used the simulated patient methodology, but it is not exclusive to this type of research. Secondly, researchers did not search, because access is unavailable in Brazil, the International Pharmaceutical Abstracts (IPAs) database, which indexes pharmacy-specific journals that are not included in any other database. Similarly, important articles that were not indexed in the selected databases would have been excluded. Hence, some studies that would have met inclusion criteria could have been left out of the review. Finally, although articles worldwide are looking into the role of the community pharmacist in managing minor illness, non-English published articles were omitted, current findings are limited to countries which publish in the English language.

CONCLUSION

Most of the studies included in this systematic review evaluated pharmacist actions in providing nonprescription medicines to treat minor illness, the level of patient adherence, and the impact of pharmacist counseling on the patient's complaint. However, this revealed deficits in quality of some variables of the studies analyzed, such as sample size calculations, participant age and duration of pharmacist-patient interaction. The systematic review revealed that although pharmacist interventions occur, like indication of non-prescription medicines and physician referral, these were few and were not evaluated for their impact on improving the minor illness because there is not a follow-up stage. As well as, the impact of patient adherence to pharmacist intervention on the minor illness relief was not observed and even the articles that deal with this verified a lack of practical measures that indicate their impact. Thus, even accounting for health promotion, pharmacist had not seized indeed that non-prescription medicines provision requires systematic and critical evaluation of the patient signs and symptoms beyond their pharmacotherapy needs. Therefore, it is necessary to improve research methods by combining qualitative and quantitative approaches to address the patient's perception of pharmacist attendance and the relationship on the assessment of complaints, the medicine indicated and clinical outcome, the economic, clinical and humanist impact

of pharmacist interventions and the applicability of minor illness diagnosis and treatment protocols in community pharmacy.

Conflict of interest

The author(s) declare(s) that they have no conflicts of interest to disclose.

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