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Original Research

Critical appraisal of simulated patient methodology to assess the practice of community pharmacist in the Middle East and North Africa region: A systematic review

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Abstract

Background: The use of simulated patient (SP) methodology in pharmacy practice settings has increased recently. However, its applications can vary significantly within a region, hence affecting the quality of the SP methodology. **Objective:** The purpose of this systematic review is to critically assess the use of the SP methodology for assessing the practice of community pharmacists (CP) in the Middle East and North Africa (MENA) region. **Methods:** A comprehensive literature search was conducted using EMBASE, MEDLINE, ProQuest, and SCOPUS to identify articles published from 2011 to 2022. The selection of relevant studies for inclusion in the systematic review was based on the pre-determined inclusion criteria. The Mixed Method Appraisal Tool (MMAT) was used to assess the methodological quality of the included studies. **Results:** Electronic search yielded 478 publications. A total of 45 studies were reviewed. The studies were conducted in 12 countries of the MENA region. The sample size between the reviewed articles ranged from 20 to 1000 (median= 129). A greater number of the included studies measured the adequacy of skill (pre-dispensing and/or post-dispensing) 38 (84.4%). The vast majority of the studies reported unsatisfactory results regarding the competencies of CP. The number of the SP ranged from 1 to 37 (median= 2). Most of the studies recruited only one SP per pharmacy 35 (77.8%). The most common data collection method was written data collection form 42 (93.3%). Few studies only had a detection system for SP visits 11 (24.4%), and only six studies incorporated performance feedback (13.3%). More than two-thirds of the studies provided a training session for SP 37 (82.2%). There was variation in the symptoms and drugs used in the SP scenarios in the studies. **Conclusion:** Although the results demonstrate the growth in the use of the SP method in MENA region countries, studies showed high variability in the level of reporting the study methodology. Consequently, we argue the need for standardized reporting of these studies.

Keywords: simulated patient; community pharmacy; the Middle East and North Africa

INTRODUCTION

Over the past few years, the nature of pharmacy practice has changed considerably, especially after the introduction of the philosophy of pharmaceutical care (PC).[1,2] PC reshaped the approach of pharmacy practice to be a patient-centered rather than a product-centered profession which requires pharmacists to take responsibility as patients' direct care providers.[2,3] Several research works were carried out to determine and evaluate the pharmacists' abilities to improve health outcomes. The simulated patient (SP) method has been assumed to be one of the most reliable methods for evaluating the competencies of the community pharmacists (CP).[4-10]

The use of SP methodology in pharmacy practice settings has gained momentum recently.[10] For example, Mesquita et al reviewed the use of the SP method to enhance the communication skills of pharmacists and identified 15 studies that met their inclusion criteria.[11] Xu et al. explored the use of the method in community pharmacy for non-prescription medicines and found 30 studies between 1990 and 2010.[12] While, Watson et al[13] and Björnsdottir et al.[14] reviewed the use of the method in all areas of pharmacy practice and included 46 papers and 148 papers, respectively.

The number of studies using SP methods has increased considerably in developing countries, similar to the developed countries.[10] However, none of the previous reviews focused on developing regions like the Middle East and North Africa (MENA) region countries, where pharmacists often serve as the main source of medical services. Thus, the present review was designed to critically assess the use of the SP methodology for assessing the practice of community pharmacists (CP) in the Middle East and North Africa (MENA).

METHODS

Data sources and search strategy

The following databases were searched to identify relevant

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studies: EMBASE, MEDLINE (Ovid), ProQuest, and SCOPUS. The following keywords:

pseudo patient - pseudo customer - standardised patient - standardized patient - shopper patient - mystery shopper - simulated patient - pseudo patron - covert participant - surrogate shopper - disguised shopper - community pharmacy – community pharmacist was used to search for publications addressing the topic from different countries of the MENA region. The keywords were combined using Boolean operators (AND/OR) to retrieve relevant references. Specific limits were applied to each database if appropriate. A manual search of all relevant electronically-retrieved articles was also carried out to identify any additional studies not identified from the electronic searches.

Selection of studies

The selection of relevant studies for inclusion in the systematic review was based on the pre-determined eligibility criteria. Studies assessing the practice of CP using the SP methodology in the MENA region as a primary or secondary objective were included. The search strategy and review protocol were jointly developed by the four researchers. Data collection and extraction were carried out independently by FB and MD and data were entered into an Excel spreadsheet. Any disagreements that occurred between the two reviewers were resolved through discussion among all authors.

Data extraction

A data extraction form was designed according to the objectives of the review after an extensive literature review,[6,8,10,15] and included the following information: title, authors, year of publication, country, study design, study setting, population studied, sample size, sample recruitment method, outcomes measured, major findings, gender of SP, Background of SP, the total number of SP, number of SP per pharmacy, number of simulated visits per pharmacy, data collector, data collection method, detection system, performance feedback, pilot study, training details, number of standardized scenarios, followed guidelines, therapeutic group of the drug under investigation, disease/symptoms under investigation, ethical approval, consent to participate.

Prior to reviewing the included articles, the developed data extraction form and screening parameters were pilot tested to ensure inter-reviewer reliability of the tool and consistency in data extraction.

Quality assessment

The quality assessment of the methodology of the included articles was undertaken using the Mixed Method Appraisal Tool (MMAT).[16] The MMAT is a validated tool designed for the appraisal of different types of research designs (qualitative research, randomized controlled trials, non-randomized studies, quantitative descriptive studies, and mixed-methods studies). The MMAT checklist includes screening questions that can be used across all relevant studies to determine an overall quality score for each included study. The MMAT tool was used along with the tool guide to ensure consistency and reliability of scoring. Two researchers were involved in the quality assessment and any disagreements in assessment decisions were resolved through discussion among all authors.

Data synthesis

Meta-analysis of the findings was not possible due to considerable methodological heterogeneity between the included studies, including different study designs, and outcomes measures. Thus, data synthesis in this review was performed using a narrative approach. This systematic review was developed and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standards.[17]

RESULTS

Electronic search yielded 478 publications. Of these, 279 studies were potentially eligible based on title and abstract screening. Full-text of the 66 remaining articles and two additional articles identified manually were retrieved for further eligibility assessment. Finally, 45 articles[18-62] were considered eligible based on the predetermined inclusion and exclusion criteria. The PRISMA flow diagram for the studies selection process is presented in Figure 1.

Quality assessment of the included studies

The majority of the studies employed a cross-sectional SP methodology 42 (93.3%), one was an intervention study,[38] and two were a mixed-methods study, with an SP in its quantitative phase and an interview in the qualitative phase.[36,57]

The appraisal of the identified articles based on the MMAT checklist revealed that all the studies demonstrated sufficient methodological rigors and robustness. The key limitation of the cross-sectional survey studies was the lack of clear research questions. In addition, the two mixed-methods studies provided limited information on how the quantitative and qualitative data were integrated. Most of these studies also had an acceptable response rate (50-100%), appropriate measurement, description of sample characteristics, relevant sampling strategy, and data that addressed the aims/objectives of the studies.

The characteristics of the included studies

The identified studies were published between 2011 and 2022. The number of studies increased gradually from 2011, reaching a peak in 2019 and 2020 followed by a decline. Lower numbers in 2021 could be due to the effect of COVID-19 pandemic on observational researches. However, lowers numbers in 2020 could be the result of delays in indexing and abstracting (see Figure 2).

The studies were conducted in 12 countries in MENA region (Egypt,[36,57] Iran,[25,28,52] Iraq,[32,34] Jordan,[31,38,42,53,60,61] Lebanon,[43,44,56,62] Libya,[27,48] Qatar[26,29,30,35] Saudi Arabia,[20,22,24,33,39,40,45,47] Sudan,[21,54,59] Syria,[18] United Arab Emirates, [19,41,46,50,51,55,58] Yemen.[23,37,49] One study was carried out in community pharmacies and clinics.[27] The sample size ranged from 20 to 1000 (median= 129). The target populations in all the studies were CP 28 (62.2%),[19-

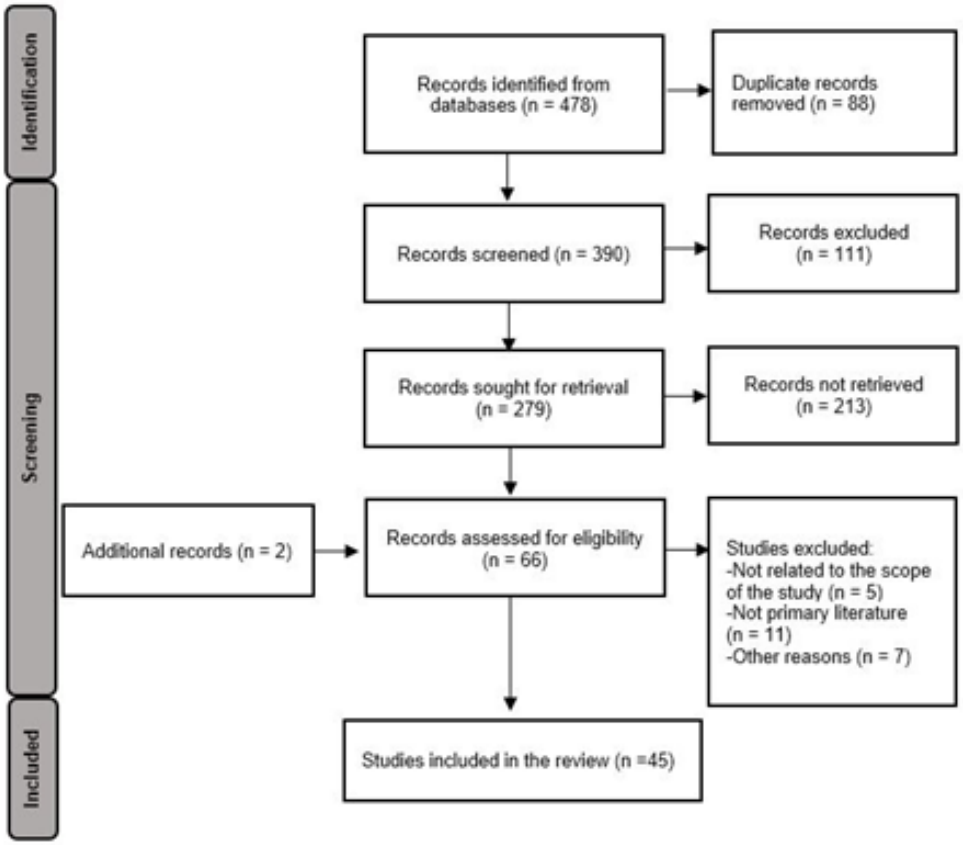

Figure 1. Flow diagram of paper selection process using PRISMA guidelines

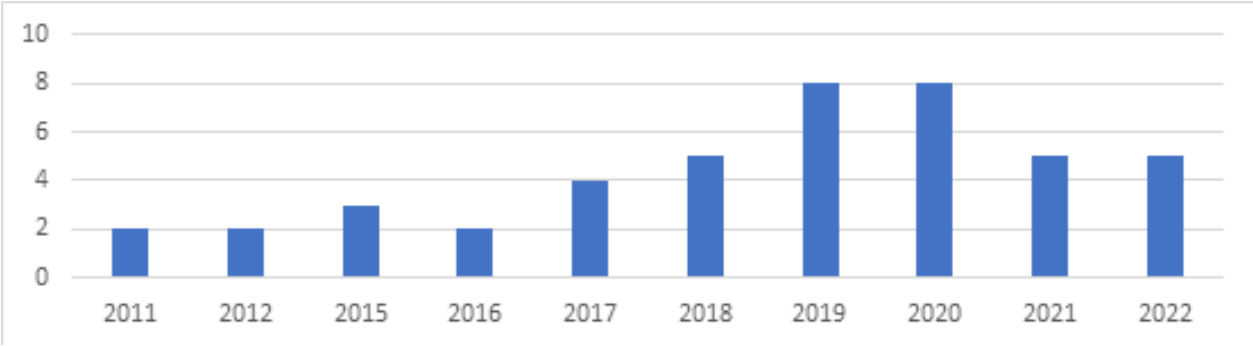

Figure 2. The number of studies used simulated patient methodology in community pharmacy practice in the MENA region

[22,24,26,29,30,32-35,38,39,41,42,46,47,49-55,58-60] pharmacy staff (pharmacists and non-pharmacists) 10 (22.2%),[18,23,31,36,37,43,44,48,57,60] and CP and GP 1 (2.2%).[27] Table 1 provides a summary of the descriptive characteristics of the included studies in the review.

The outcomes measures and major findings of the included studies

More than half of the studies reported the pharmacy and pharmacy staff related information 31 (68.9%).[19-26,28,29,31-33,35,36,38,41-44,46,48-52,57,58,60-62] Some studies got the information through direct questioning of the pharmacy representatives (manager or pharmacist in charge) 3 (6.7%),[23,25,28] or the participants whom the SP was interacting with 5(11.1%).[20,57,58,60,61] Others reported the information based on estimation 9 (20%),[19,26,31,36,38,42,49,61,61] or through surveying the participants 4 (8.9%).[22,30,35,46] In addition, some studies reported the counseling/dispensing duration 14 (31.1%),[26,28,31,35,36,41-43,45,48,50,52,56,58] visit duration 7 (15.6%),[19,29,42,52,60-62] and/or waiting duration 3 (6.7%).[22,36,52]

The most outcome measured in the included studies was the adequacy of skill (pre-dispensing and/or post-dispensing) 38 (84.4%),[19,21,22,24-36,38,40-45,47-56,58-62] the the drug use pattern 19 (42.2%).[18,24,26,27,29,31-33,36,41-44,46,47,49,52,54,57] The vast majority of the studies reported unsatisfactory results, including inadequate skill (pre-dispensing and/ or post-dispensing) 36 (80%),[19,21,22,24-28,30-36,38,40-43,45,47-56,58-62] and irrational drug use 15 (33.3%).[18,24,26,27,29,31,33,36,41-44,46,54,57] Table 2 presents a summary of the outcome's measures and major findings of the included studies (Supplementary document: Table 1).

Table 1. Descriptive characteristics of the included studies (arranged chronologically)

Author, Year	Country	Study design	Study setting	Target population	Sample size	Sample recruitment method
(Al-Faham et al., 2011)	Syria	Cross-sectional, SP	Community pharmacies	Pharmacy staff (pharmacists and non-pharmacists)	224	Random sampling
(Alomar et al., 2011)	United Arab Emirates	Cross-sectional, SP	Community pharmacies	CP	194	Convenience sampling
(Khan and Azhar, 2012)	Saudi Arabia	Cross-sectional, SP	Community pharmacies	CP	71	Cluster
(Osman et al., 2012)	Sudan	Cross-sectional, SP	Community pharmacies	CP	300	Convenience sampling
(Al-Worafi, 2015)	Yemen	Cross-sectional, SP	Community pharmacies	Pharmacy staff (pharmacists and non-pharmacists)	300	Convenience sampling
(Alaqeel and AbaNMy, 2015)	Saudi Arabia	Cross-sectional, SP and survey	Community pharmacies	CP	SP: 161, Survey: 400	Stratified convenience sampling
(Kashour et al., 2015)	Saudi Arabia	Cross-sectional, SP	Community pharmacies	CP	600	Stratified convenience sampling
(Foroutan and Dabaghzadeh, 2016)	Iran	Cross-sectional, SP	Community pharmacies	CP	94	NM
(Ibrahim et al., 2016)	Qatar	Cross-sectional, SP	Community pharmacies	CP	30	Random sampling
(Atia and Abired, 2017)	Libya	Cross-sectional, SP	Community pharmacies and clinics	CP and GPs	20 (10 Community pharmacies and 10 clinics)	Random convenience sampling
(Dabaghzadeh and Hajjari, 2017)	Iran	Cross-sectional, SP	Community pharmacies	CP	97	NM
(Mohamed Ibrahim et al., 2017)	Qatar	Cross-sectional, SP	Community pharmacies	CP	25	Random sampling
(Paravattil et al., 2017)	Qatar	Cross-sectional, SP and survey	Community pharmacies	CP	129	Random sampling
(Hammad et al., 2018)	Jordan	Cross-sectional, SP	Community pharmacies	Pharmacy staff (pharmacists and non-pharmacists)	72	Cluster, stratified convenience sampling
(Ibrahim et al., 2018)	Iraq	Cross-sectional, SP	Community pharmacies	CP	75	Convenience sampling
(Mahmoud et al., 2018)	Saudi Arabia	Cross-sectional, SP	Community pharmacies	CP	300	Convenience sampling
(Mikhael et al., 2018)	Iraq	Cross-sectional, SP	Community pharmacies	CP	54	Convenience sampling
(Zolezzi et al., 2018)	Qatar	Cross-sectional, SP and survey	Community pharmacies	CP	50	Convenience sampling
(Abdelaziz et al., 2019)	Egypt	Cross-sectional, mixed method (SP and interview)	Community pharmacies	Pharmacy staff (pharmacists and non-pharmacists)	SP:150, interview: 100	Random convenience sampling
(Al-Worafi et al., 2019)	Yemen	Cross-sectional, SP	Community pharmacies	Pharmacy staff (pharmacists and non-pharmacists)	166	Convenience sampling
(Elayeh et al., 2019)	Jordan	Cross-sectional, intervention (SP and workshop)	Community pharmacies	CP	60	Random sampling
(Khojah, 2019a)	Saudi Arabia	Cross-sectional, SP	Community pharmacies	CP	80	Random sampling
(Khojah, 2019b)	Saudi Arabia	Cross-sectional, SP	Community pharmacies	CP	100	Random sampling
(Mobark et al., 2019)	United Arab Emirates	Cross-sectional, SP	Community pharmacies	CP	201	Stratified convenience sampling

(Wazaify et al., 2019)	Jordan	Cross-sectional, SP	Community pharmacies	CP	67	Stratified convenience sampling
(Yaacoub et al., 2019a)	Lebanon	Cross-sectional, SP	Community pharmacies	Pharmacy staff (pharmacists and non-pharmacists)	250	Stratified random sampling
(Yaacoub et al., 2019b)	Lebanon	Cross-sectional, SP	Community pharmacies	Pharmacy staff (pharmacists and non-pharmacists)	250	Stratified random sampling
(Al Qarni et al., 2020)	Saudi Arabia	Cross-sectional, SP	Community pharmacies	CP	90	Stratified convenience sampling
(Al-Amad et al., 2020)	United Arab Emirates	Cross-sectional, SP	Community pharmacies	CP	120	Random convenience sampling
(Al-Tannir et al., 2020)	Saudi Arabia	Cross-sectional, SP	Community pharmacies	CP	327	Stratified random sampling
(Atia, 2020)	Libya	Cross-sectional, SP	Community pharmacies	Pharmacy staff (pharmacists and non-pharmacists)	169	Convenience sampling
(Halboup et al., 2020)	Yemen	Cross-sectional, SP	Community pharmacies	CP	1000	Stratified convenience sampling
(Palaian et al., 2020)	United Arab Emirates	Cross-sectional, SP	Community pharmacies	CP	50	Convenience sampling
(Rashid et al., 2020)	United Arab Emirates	Cross-sectional, SP	Community pharmacies	CP	510	Stratified random sampling
(Soltani et al., 2020)	Iran	Cross-sectional, SP	Community pharmacies	CP	405	Convenience sampling
(Al-Qudah et al., 2021)	Jordan	Cross-sectional, SP	Community pharmacies	CP	30	Random sampling
(Hamadouk et al., 2021)	Sudan	Cross-sectional, SP	Community pharmacies	CP	235	Random sampling
(Hasan et al., 2021)	United Arab Emirates	Cross-sectional, SP	Community pharmacies	CP	214	Random sampling
(Itani et al., 2021)	Lebanon	Cross-sectional, SP	Community pharmacies	CP	100	Random sampling
(Tawfik et al., 2021)	Egypt	Cross-sectional, mixed method (SP and interview)	Community pharmacies	Pharmacy staff (pharmacists and non-pharmacists)	SP:150, interview: 100	Stratified random sampling
(Alzubaidi et al., 2022)	United Arab Emirates	Cross-sectional, SP	Community pharmacies	CP	133	Stratified random sampling
(Hamadouk et al., 2022)	Sudan	Cross-sectional, SP	Community pharmacies	CP	232	Systematic sampling
(Hammad et al., 2022a)	Jordan	Cross-sectional, SP	Community pharmacies	Pharmacy staff (pharmacists and non-pharmacists)	72	Convenience sampling
(Hammad et al., 2022b)	Jordan	Cross-sectional, SP	Community pharmacies	CP	57	Cluster, stratified convenience sampling
(Karout et al., 2022)	Lebanon	Cross-sectional, SP	Community pharmacies	CP	100	Random sampling

Abbreviations: SP= simulated patient, CP= community pharmacist, NM= not mentioned, GP= general practitioners

Table 2. Outcomes measures and major findings of the included studies

Main outcomes N (%)		**Major findings N (%)**	
Adequacy of skill (pre-dispensing and/ or post dispensing)	38 (84.4%)	Adequate	1 (2.2%)
		Inadequate	38 (84.4%)
Drug use	19 (42.2%)	Rational	4 (8.9%)
		Irrational	15 (33.3%)
Communication skills	8 (17.8%)	Adequate	1 (2.2%)
		Inadequate	6 (13.3%)
		NR	1 (2.2%)
Knowledge level	6 (13.3%)	High	1 (2.2%)
		Low	5 (11.1%)

Barriers to counseling/ and or management	3 (6.7%)	Inaccessibility to the patient medical history	1 (2.2%)
		Inadequate space	1 (2.2%)
		Lack of support	1 (2.2%)
		Lack of time	3 (6.7%)
		Patient is not interested	1 (2.2%)
Cost level	3 (6.7%)	High	1 (2.2%)
		Low	0
		NR	2 (4.4%)
Privacy level	3 (6.7%)	High	2 (4.4%)
		Low	1 (2.2%)
Acceptability of SP visit	2 (4.4%)	Positive	2 (4.4%)
		Negative	0
Conformity rate to international guidelines	2 (4.4%)	High	1 (2.2%)
		Low	1 (2.2%)
Self-reported skill	2 (4.4%)	Adequate	2 (4.4%)
		Inadequate	0
Attitude level	1 (2.2%)	High	1 (2.2%)
		Low	0
Diagnosis	1 (2.2%)	Proper	0
		Improper	1 (2.2%)
Number of pharmacists	1 (2.2%)	Sufficient	0
		Insufficient	1 (2.2%)
Perceived preparedness	1 (2.2%)	High	1 (2.2%)
		Low	0
Professional collaboration	1 (2.2%)	High	0
		Low	1 (2.2%)

Abbreviations: NR= not reported, SP= simulated patient

The characteristics of the simulated patient and simulated visit

A broad variety of terms were used in the studies to the individuals used to perform the simulated visits. The individuals were described as SP 37 (82.2%),[19,20,22-28,30-36,38,41-45,47-52,54-56,58-63] simulated client 10 (22.2%),[18,21,24,27,29,35,39,40,47,57] and mystery shopper 10 (22.2%),[23,26,29,32,40-42,54,55,59] mystery patient 3 (6.7%),[21,26,32] pseudo patient 4 (8.9%),[21,23,24,55] pseudo customer 3 (6.7%),[23,24,42] investigator 2 (4.4%),[18,47] covert patient 1 (2.2%),[21] pseudo patron 1(2.2%),[23] standardized client 1(2.2%),[21] standardized patient 1 (2.2%),[55] shopper patient 1(2.2%),[23] simulated customer 1 (2.2%),[39] simulated shopper 1 (2.2%),[21] secret shopper 1 (2.2%),[58] surrogate shopper 1 (2.2%),[21] surrogate client 1 (2.2%).[21] In addition, many articles provided brief background or defined what was meant by SP or the equivalent term 17 (37.8%).[19,21-26,28-30,32-36,38,41,42,45,46,50,52-60,62]

The SP were recruited from a different range of backgrounds, including students 25 (55.6%),[18,20,22,24,26-29,33,34,36,39,41,42,46,48,49,52-55,57,59-61] pharmacists 11 (24.4%),[21,23,31,32,37,38,43-45,50,62] or researcher 5 (11.1%).[19,51,56,58,62] The total number of the SP ranged from 1 to 37 (median= 2). Most of the studies recruited only one SP entering each pharmacy 35 (77.8%).[18,19,21-32,34,35,37,38,40-42,46,48-52,54-57,59-62] The majority of the pharmacists were evaluated one time 36 (80%).[18-25,28,30-35,37-44,46-49,51,52,55-58,60-62]

Data of the visits were recorded by SP alone that incorporated the simulated visit 29 (64.4%).[18,19,21-23,26,27,29-32,34,35,37,41,42,46,48-56,59,61,62] Furthermore, data were recorded using written data collection form 42 (93.3%),[19-27,29-45,47-62] audio recording 10 (22.2%),[23,25,28,37,38,42,54,59-61] or video recording 2 (4.4%).[23,37] Most of the studies reported the data immediately after the visit 31 (68.9%),[21,22,24,26,29-35,38-42,44,47,49-56,58-62] or during the visit over the phone 4 (8.9%)[20,36,56,57] where one of the SP entered the pharmacy and asked the pharmacist to talk with his relative via phone. This relative was another SP who's responsible for reporting the data while talking to the pharmacist.

Few studies only had a detection system for SP visits 11 (24.4%).[25,28,35,38,45,51,51,52,57,60-62] Also, only few studies incorporated performance feedback 6 (13.3%).[23,29,37,38,60,61] Of them, the performance feedback was delivered verbally immediately after the simulated visit.[60,61] One study did a workshop that was held after the SP study, which involved one on one training, small group discussions, and post-workshop evaluation to assess the efficacy of the workshop.[38] In another two studies by Al-Worafi, the feedback was delivered through a 30 min meeting along with educational materials (Video and brochures) about metered-dose inhaler (MDI) appropriate use.[23,37] In another study, the authors briefed the participants about the findings and recommended steps to enhance their performance.[29] More than two-thirds of the studies provided a training session for the SP 37 (82.2%).[20,22-25,2742,44,45,48-51,53-62] Table 3 provides a summary of the characteristics of the SP and simulated visits.

The characteristics of the employed scenarios

The scenarios were drug only 27 (60%),[18-23,25,28,30,34-41,45,47-51,57,59-61] symptoms of a condition 19 (42.2%),[24,26,27,29,31-33,42-44,46,47,52-56,58,62] or drug and condition 5 (11.1%).[18,36,47-49] All the scenarios were standardized, with details mentioned within the paper or supplementary material. The number of the standardized scenarios ranged from 1 to 6 (median= 1).

The scenarios used a variety of symptoms and drugs to investigate different aspects. Drug under investigation in most studies was antibacterials for systemic use 14 (31.1%).[18,22,25,36,43-45,47,49,50,52,53,57,59] A vast array of medical conditions were assessed in the studies, most commonly minor acute conditions 33 (73.3%).[18-23,25-54,56-62] More details are presented in Table 4.

Ethics and consent

More than three quarters of the studies reported that ethical approval was obtained for the conduct of the study 40 (88.9%).[20-26,28-42,45-62] While, consent to participate was obtained in half of the studies only 22 (48.9%).[23,25,28-31,34-38,41,42,46,51,54,55,57-61] Consent to participate was collected mainly prospectively 14 (31.1%).[23,25,28,31,37,38,41,42,51,54,55,59-61]

DISCUSSION

The present review was designed to explore the use of SP methodology in the community pharmacy setting in the MENA region countries and to recognize significant characteristics that

Table 3. Characteristics of the SP and simulated visits (arranged chronologically)

Author, Year	Gender of SP	Background of SP	Total number of SP	Number of SP per pharmacy	Number of simulated visits per pharmacy	Data collector	Data collection method	Detection system (survey, SP judgment, notification from pharmacy staff)	Performance feedback	Pilot study	Training			
											Training	Trainer	Duration	Content
(Al-Faham et al., 2011)	Female	Student	3	1	1	SP	NM	None	None	None	None			
(Alomar et al., 2011)	Female	Researcher	1	1	1	SP	Written form	None	None	None	None			
(Khan and Azhar, 2012)	NM	Student	6	2	1	Observer	Written form (during the visit)	None	None	None	Yes	NM	NM	Scenario
(Osman et al., 2012)	NM	Pharmacist	1	1	1	SP	Written form (immediately after)	None	None	None	None			
(Al-Worafi, 2015)	NM	Pharmacist	3	1	1	SP	Audio, video, and written form	None	Yes (delayed)	None	Yes	Researcher and external examiners	NM	Metered-dose inhaler use, scenario, data collection method
(Alaqeel and abanmy, 2015)	Female	Student	4	1	1	SP	Written form (immediately after)	None	None	8	Yes	Researchers	NM	Scenario and data collection method
(Kashour et al., 2016)	Male	Student	37	2	1	SP and observer	Written form (immediately after)	None	None	20 (excluded)	Yes	Researcher	NM	Scenario
(Foroutan and Dabaghzadeh, 2016)	Female	NM	3	1	1	Researcher	Audio and written form	Yes (SP judgment)	None	None	Yes	Researcher	8 hours	Scenario
(Ibrahim et al., 2016)	NM	Student	2	1	2	SP	Written form (immediately after)	None	None	3 (excluded)	Yes	NM	2-3 hour in 2 sessions	Scenario
(Atia and Abired, 2017)	NM	Student	12	1	2	SP	Written form	None	None	None	Yes	NM	I week	Scenario and data collection method
(Dabaghzadeh and Hajjari, 2017)	Male	Student	2	1	1	Researcher	Audio	Yes (SP judgment)	None	None	Yes	Researchers	3 hours	Scenario, data collection method and knowledge about multivitamins then evaluation

(Mohamed Ibrahim et al., 2017)	NM	Student	2	1	2	SP	Written form (immediately after)	None	Yes (delayed)	10 (excluded)	Yes	Two pharmacy faculty members and one physician	2 hours	Scenario
(Paravattil et al., 2017)	Males and females	NM	4	1	1	SP	Written form (immediately after)	None	None	None	Yes	Researchers	3 months	Scenario
(Hammad et al., 2018)	Female	Pharmacist	1	1	1	SP	Written form (immediately after)	None	None	5 (excluded)	Yes	NM	NM	Scenario
(Ibrahim et al., 2018)	Female	Pharmacist	1	1	1	SP	Written form (immediately after)	None	None	None	None			
(Mahmoud et al., 2018)	NM	Student	2	2	1	SP and observer	Written form (immediately after)	None	None	5	Yes	NM	NM	NM
(Mikhael et al., 2018)	Female	Student	1	1	1	SP	Written form (immediately after)	None	None	None	Yes	Certified diabetes educator	NM	Insulin injecting use
(Zolezzi et al., 2018)	Males and females	NM	2	1	1	SP	Written form (immediately after)	Yes (SP judgment)	None	3 (excluded)	Yes	NM	NM	Scenario and data collection method
(Abdelaziz et al., 2019)	Male	Student	2	2	2	Observer	Written form (during the visit)	None	None	10 (included)	Yes	CP	NM	Scenario
(Al-Worafi et al., 2019)	NM	Pharmacist	2	1	1	SP	Audio, video, and written form	None	Yes (delayed)	None	Yes	Researchers and external examiners	NM	Metered-dose inhaler use, scenario, data collection method
(Elayeh et al., 2019)	Male	Pharmacist	1	1	1	Researcher	Audio and written form (immediately after)	Yes (survey)	Yes (delayed)	5	Yes	Researchers	2 hours	Scenario
(Khojah, 2019a)	Males and females	Student	4	2	1	SP and observer	Written form (immediately after)	None	None	None	Yes	NM	NM	Scenario
(Khojah, 2019b)	NM	NM	4	1	1	SP	Written form (immediately after)	None	None	None	Yes	NM	NM	Scenario
(Mobark et al., 2019)	Female	Student	1	1	1	SP	Written form (immediately after)	None	None	10 (excluded)	Yes	Researchers	2 hour	Scenario and data collection method
(Wazaify et al., 2019)	Female	Student	1	1	1	SP	Audio and written form (immediately after)	None	None	5 (excluded)	Yes	Researchers	1 day	Scenario, data collection method

(Yaacoub et al., 2019a)	NM	Pharmacist	2	2	1	SP and observer	Written form	None	None	None	None	Yes	NM	NM	Scenario
(Yaacoub et al., 2019b)	NM	Pharmacist	2	2	1	SP and observer	Written form (immediately after)	None	None	None	None	Yes	NM	NM	Scenario
(Al Qarni et al., 2020)	NM	Pharmacist	2	2	1 to 2	SP and observer	Written form	Yes (SP judgment)	None	None	None	Yes	NM	NM	Scenario
(Al-Amad et al., 2020)	NM	Student	5	1	1	SP	NM	None	None	None	None	None			
(Al-Tannir et al., 2020)	NM	NM	2	2	1	SP and observer	Written form (immediately after)	None	None	None	None	None			
(Atia, 2020)	Female	Student	13	1	1	SP	Written form	None	None	None	None	Yes	NM	NM	Scenario
(Halboup et al., 2020)	Female	Student	5	1	1	SP	Written form (immediately after)	None	None	25 (excluded)	None	Yes	Pharmacist	NM	Scenario
(Palaian et al., 2020)	Female	Pharmacist	5	1	5	SP	Written form (immediately after)	None	None	5	None	Yes	Researchers	NM	Scenario and data collection method
(Rashid et al., 2020)	Female	Researcher	1	1	1	SP	Written form (immediately after)	Yes (notification from pharmacy staff)	None	10 (excluded)	None	Yes	Researchers	2 hours	NM
(Soltani et al., 2020)	Female	Student	1	1	1	SP	Written form (immediately after)	Yes (SP judgment)	None	50	None	None			
(Al-Qudah et al., 2021)	NM	Student	2	2	2	SP	Written form (immediately after)	None	None	4 (included)	None	Yes	Researchers and pharmacist	1.5 hours	Scenario
(Hamadouk et al., 2021)	Males and females	Student	6	1	2	SP	Audio and written form (immediately after)	None	None	18 (excluded)	None	Yes	NM	NM	Scenario
Hasan et al., 2021	Female	Student	3	1	1	SP	Written form (immediately after)	None	None	10 (excluded)	None	Yes	NM	NM	Scenario
(Itani et al., 2021)	Female	Researcher	1	1	1	SP	Written form (during the visit or immediately after)	None	None	15 (excluded)	None	Yes	Nm	NM	Scenario
(Tawfik et al., 2021)	Male	Student	1	1	1	Observer	written form (during the visit)	Yes (notification from pharmacy staff)	None	None	None	Yes	Pharmacists	3 days, 4 hours each	Scenario
(Alzubaidi et al., 2022)	Males and females	Researcher	5	2	1	SP and observer	Written form (immediately after)	None	None	None	None	Yes	NM	5 sessions, 45 minutes each	Scenario

(Hamadouk et al., 2022)	Males and females	Student	10	1	2	SP	Audio and written form (immediately after)	None	None	30 (excluded)	Yes	NM	2 weeks		Scenario
(Hammad et al., 2022a)	Males and females	Student	4	1	1	SP and researcher	Audio and written form (immediately after)	Yes (survey)	Yes (immidiately)	8	Yes	Researcher	1 day		Scenario and data collection
(Hammad et al., 2022b)	Males and females	Student	4	1	1	SP	Audio and written form (immediately after)	NM	Yes (immidiately)	8	Yes	Researcher	2 day		Scenario and data collection
(Karout et al., 2022)	Female	Researcher and pharmacist	1	1	1	SP	Written form (immediately after)	Yes (SP judgment)	None	10 (excluded)	Yes	Researcher	NM		Scenario and data collection

Abbreviations: SP= simulated patient, NM= not mentioned

Table 4. Characteristics of the employed scenarios (arranged chronologically)

Author, Year	identity of the patient	Scenario	Number of standardized Scenario	Followed guidelines	Therapeutic Group of the Drug under investigation (according to ATC classification)	Disease/symptoms under investigation
(Al-Faham et al., 2011)	Relative or friend	Drug and condition	1	EPOS	Antibacterials for systemic use, without prescription	Minor, acute (rhinosinusitis)
(Alomar et al., 2011)	SP	Drug only	1	ASHP	Drugs used in diabetes: glibenclamide, metformin, Drugs for obstructive airway diseases: salbutamol, corticosteroids for systemic use: Prednisolone, with prescription	NA
(Khan and Azhar, 2012)	SP	Drug only	1	NAEPP	Drugs for obstructive airway diseases: metered-dose inhaler, without prescription	NA
(Osman et al., 2012)	SP	Drug only	4	previously published article/s	Drugs for obstructive airway diseases: Vental®, Aero-chamber®, Symbicort®, Seretide®, without prescription	NA
(Al-Worafi, 2015)	SP	Drug only	1	NAEPP	Drugs for obstructive airway diseases: Salbutamol, without prescription	NA
(Alaqeel and AbaNMy, 2015)	SP	Drug only	4	previously published article/s	Antianemic (iron supplement), Drugs for acid-related disorders: Aluminium-containing antacid, Antibacterials for systemic use: amoxicillin, Lipid modifying agents: Simvastatin, without prescription	NA
(Kashour et al., 2016)	Relative or friend	Symptoms of condition	2	NM	NA	Major, acute: (acute cardiac symptoms (acute coronary syndrome (ACS) scenariom or an acute heart failure (AHF) scenario)
(Foroutan and Dabaghzadeh, 2016)	SP	Drug only	1	FIP and WHO	Antibacterials for systemic use: Ciprofloxacin, with prescription and Sex hormones and modulators of the genital system: oral contraceptive without prescription	NA
(Ibrahim et al., 2016)	SP	Symptoms of condition	1	Consultation with a physician and a pharmacist	NA	Minor, acute (gastroenteritis)

(Atia and Abired, 2017)	SP	Symptoms of condition	1	NM	NA		Minor, acute (common cold)
(Dabaghzadeh and Hajjari, 2018)	SP	Drug only	1	FIP, WHO, and ASHP	Vitamins, Anti-acne preparations: isotretinoin, without prescription		NA
(Mohamed Ibrahim et al., 2018)	NM	Symptoms of condition	2	FIP and WHO	NA		Minor, acute (common cold), minor, chronic (allergic rhinitis)
(Paravattil et al., 2017)	SP	Drug only	4	ASHP, ASCP, FIP, NAPRA. PSA	Drugs used in diabetes: glimepiride and Drugs for obstructive airway diseases: Salbutamol, with prescription		NA
(Hammad et al., 2018)	SP	Symptoms of condition	1	previously published article/s and WWHAM counseling frameworks	NA		Minor, acute (headache)
(Ibrahim et al., 2018)	SP	Symptoms of condition	1	WHO	NA		Minor, acute (diarrhea)
(Mahmoud et al., 2018)	SP	Symptoms of condition	1	previously published article/s	NA		Minor, acute (lower back pain)
(Mikhael et al., 2018)	SP	Drug only	1	previously published article/s	Drugs used in diabetes: Lente and regular insulin, with prescription		NA
(Zolezzi et al., 2019)	SP	Drug only	2	previously published article/s, AFPC, and NAPRA	Antithrombotic agents: Aspirin®, Lipid modifying agents: Crestor®, without prescription		NA
(Abdelaziz et al., 2019)	Relative or friend	Drug and condition	2	ACP and FIP	Antibacterials for systemic use: amoxicillin, without prescription		Minor, acute (Viral bronchitis and common cold)
(Al-Worafi et al., 2019)	SP	Drug only	1	previously published article/s	Drugs for obstructive airway diseases: Salbutamol		NA
(Elayeh et al., 2019)	SP	Drug only	1	previously published article/s	Drugs for obstructive airway diseases: Ventolin® and Pulmicort®, with prescription		NA
(Khojah, 2019a)	Relative or friend	Drug only	1	NM	Non-specified vaginal tablet, without prescription		NA
(Khojah, 2019b)	SP	Drug only	1	NM	Antihistamines for systemic use (first generation antihistamine), without prescription		NA
(Mobark et al., 2019)	SP	Drug only	1	Standard Procedures Algorithm for Oregon RPh Prescribing of Contraceptives and previously published article	Sex hormones and modulators of the genital system: oral contraceptive, with and without prescription		NA
(Wazaify et al., 2019)	SP	Symptoms of condition	1	previously published article/s	NA		Minor, acute (insomnia)

(Yaacoub et al., 2019a)	Relative or friend	Symptoms of condition	1	IDSA, ESCMID, EAU, and AAFP	NA		Minor, acute (uncomplicated cystitis)
(Yaacoub et al., 2019b)	Relative or friend	Symptoms of condition	1	IDSA	NA		Minor, acute (Bacterial Rhinosinusitis)
(Al Qarni et al., 2020)	NM	Drug only	2	NM	Analgesics (ibuprofen), Antibacterials for systemic use: Coamoxicillin, without prescription		NA
(Al-Amad et al., 2020)	Relative or friend	Symptoms of condition	4	NM	NA		Minor, acute (candidasis and aphthous ulcer), minor, chronic (erosive lichen planus), and major, chronic (squamous cell carcinoma)
(Al-Tannir et al., 2020)	Relative or friend	Drug and condition	6	previously published article/s	Antibacterials for systemic use, without prescription		minor, acute (Sore throat, Acute sinusitis, Otitis media, Acute bronchitis, Diarrhea, UTI)
(Atia, 2020)	SP	Drug and condition	1	NM	Antihistamines for systemic use (first generation antihistamine), without prescription		Minor, acute (common cold)
(Halboup et al., 2020)	Relative or friend	Drug and condition	5	previously published article/s	Antibacterials for systemic use, without prescription		Minor, acute (sore throat, otitis media, cough, diarrhea, and UTI)
(Palaian et al., 2020)	Relative or friend	Drug only	5	PCNE	Drugs for obstructive airway diseases: MDI, Ventolin, Fluticasone, Analgesics: ibuprofen, Antibacterials for systemic use: Augmentin®, Antidiarrheals, intestinal anti-inflammatory/anti-infective agents (oral rehydration salts), Drugs for functional gastrointestinal disorders: Metoclopramide, Drugs for constipation: Bisacodyl, Antithrombotic agents: clopidogrel, Lipid modifying agents: Atorvastatin, with prescription	NA	
(Rashid et al., 2020)	SP	Drug only	1	previously published article/s and BAD	Anti-acne preparations: oral isotretinoin, with prescription	NA	
(Soltani et al., 2020)	Relative or friend and SP	Symptoms of condition	2	ESCMID and IDSA	NA		Minor, acute (sore throat and dysuria)
(Al-Qudah et al., 2021)	SP	Symptoms of condition	2	FIP/ WHO Guidelines on Pharmacy Practice	NA		Minor, acute (common cold) and minor, chronic (allergic rhinitis)
(Hamadouk et al., 2021)	Relative or friend	Symptoms of condition	2	WHO, the American College of Gastroenterology Clinical Guidelines.	NA		Minor, acute (diarrhea)
(Hasan et al., 2021)	SP	Symptoms of condition	1	previously published article/s	NA		Major, chronic (asthma)

(Itani et al., 2021)	SP	Symptoms of condition	1	previously published article/s and (CDC)	NA		Major, chronic (diabetes mellitus) and minor, acute (COVID-19)
(Tawfik et al., 2021)	Relative or friend	Drug only	1	previously published article/s	Antibacterials for systemic use, without prescription		NA
(Alzubaidi et al., 2022)	SP	Symptoms of condition	2	previously published article/s and American Psychological Association, National Institute for Health and Clinical Excellence (NICE)	NA		Minor, chronic (Smoking)
(Hamadouk et al., 2022)	Relative or friend	Drug only	2	STROBE Statement	Antimycotics for systemic use: itraconazole, Antibacterials for systemic use: clarithromycin, metronidazole, cotrimoxazole, Lipid modifying agents: simvastatin, Antithrombotic: warfarin, with prescription		NA
(Hammad et al., 2022a)	Relative of friend	Drug only	1	previously published article/s	Lipid modifying agents: Simvastatin, without prescription		NA
(Hammad et al., 2022b)	SP	Drug only	1	previously published article/s	Drugs for acid-related disorders: Rennie antacid, without prescription		NA
(Karout et al., 2022)	SP	Symptoms of condition	1	CDC	NA		Minor, acute (COVID-19)

Abbreviations: SP= simulated patient, NM= not mentioned, EPOS= European Position Paper on Rhinosinusitis and Nasal Polyps, NAEPP= *National Asthma Education* and *Prevention Program*, FIP= International Pharmaceutical Federation, WHO= World Health Organization, ASHP= The American Society of Health–System Pharmacists, ASCP= American Society of Consultant Pharmacists, NAPRA= National Association of Pharmacy Regulatory Authorities, PSA= Pharmaceutical Society of Australia, AFPC= The Association of Faculties of Pharmacy of Canada, ACP= American College of Physicians, IDSA= Diseases Society of America, PCNE= The Pharmaceutical Care Network Europe, ESCMID= The European Society of Clinical Microbiology and Infectious Diseases, EAU= European Association of Urology, AAFP= American Association of Family Physicians, PCNE= Pharmaceutical Care Network Europe Association, BAD= the British Association of Dermatologists, NA= not applicable, UTI=rinary tract infection.

Table 5. Securing ethical approval and obtaining informed consent from the participating sites

Author, Year	Ethical approval	Consent				
		Consent	From	By	Type	Time
(Al-Faham et al., 2011)	None	None				
(Alomar et al., 2011)	None	None				
(Khan and Azhar, 2012)	Yes	None				
(Osman et al., 2012)	Yes	None				
(Al-Worafi, 2015)	Yes	Yes	Authorized representative of the pharmacy	NM	NM	Before
(Alaqeel and AbaNMy, 2015)	Yes	None				
(Kashour et al., 2015)	Yes	None				
(Foroutan and Dabaghzadeh, 2016)	Yes	Yes	Authorized representative of the pharmacy	SP	Verbal and written	Before
(Ibrahim et al., 2016)	Yes	None				
(Atia and Abired, 2017)	None	None				
(Dabaghzadeh and Hajjari, 2017)	Yes	Yes	Authorized representative of the pharmacy	Researcher	Verbal and written	Before
(Mohamed Ibrahim et al., 2017)	Yes	Yes	NM	NM	NM	After
(Paravattil et al., 2017)	Yes	Yes	Participants	SP	Written	After
(Hammad et al., 2018)	Yes	Yes	Participants	Researcher	Written	Before
(Ibrahim et al., 2018)	Yes	None				
(Mahmoud et al., 2018)	Yes	None				
(Mikhael et al., 2018)	Yes	Yes (indirect)	Participants	NM	Online survey	NM
(Zolezzi et al., 2018)	Yes	Yes	Participants	Researcher	Written	After
(Abdelaziz et al., 2019)	Yes	Yes	Participants	NM	NM	After
(Al-Worafi et al., 2019)	Yes	Yes	Authorized representative of the pharmacy	NM	NM	Before
(Elayeh et al., 2019)	Yes	Yes	Authorized representative of the pharmacy and participants	Researcher	Written	Before
(Khojah, 2019a)	Yes	None				
(Khojah, 2019b)	Yes	None				
(Mobark et al., 2019)	Yes	Yes	Authorized representative of the pharmacy	Researcher	Verbal	Before
(Wazaify et al., 2019)	Yes	Yes	Authorized representative of the pharmacy and participants	Researcher	Written	Before
(Yaacoub et al., 2019a)	None	None				
(Yaacoub et al., 2019b)	None	None				
(Al Qarni et al., 2020)	Yes	None				
(Al-Amad et al., 2020)	Yes	Yes	Participants	SP	Written	After
(Al-Tannir et al., 2020)	Yes	None				
(Atia, 2020)	Yes	None				
(Halboup et al., 2020)	Yes	None				
(Palaian et al., 2020)	Yes	None				
(Rashid et al., 2020)	Yes	Yes	Authorized representative of the pharmacy	SP	Verbal	Before
(Soltani et al., 2020)	Yes	None				
(Al-Qudah et al., 2021)	Yes	None				

(Hamadouk et al., 2021)	Yes	Yes	Participants	NM	Written	Before and after
(Hasan et al., 2021)	Yes	Yes	Participants	NM	Verbal	Before
(Itani et al., 2021)	Yes	None				
(Tawfik et al., 2021)	Yes	Yes	Participants	NM	NM	After
(Alzubaidi et al., 2022)	Yes	Yes	Participants	SP	Written	After
(Hamadouk et al., 2022)	Yes	Yes	Participants	NM	NM	Before
(Hammad et al., 2022a)	Yes	Yes	Authorized representative of the pharmacy	Researcher	Written	Before
(Hammad et al., 2022b)	Yes	Yes	Authorized representative of the pharmacy	Researcher	Written	Before
(Karout et al., 2022)	Yes	None				

Abbreviations: SP= simulated patient, NM= not mentioned

should be considered in studies that use this methodology. The first question in this review was to address the characteristics of the studies that used the SP methodology as an assessment tool in the MENA region. The second question was to identify the outcomes being assessed. The third question was to identify the characteristics of the SP and simulated visits. The fourth question sought to recognize the scenarios employed to assess the practice of the CP. The fifth question was related to the ethics and consent issues of the included studies.

The characteristics of the included studies

Our review reported a huge variation in the sample size calculation between reviewed articles. Some studies claimed that since studies that use SP methodology are considered observational studies where representativeness is more important than a large sample size, there is no specific calculation method to measure the sample size of the population. However, a small sample size might have resulted in an inability to detect differences even if they exist and hence hinder the generalizability. One way to resolve this issue is by using a consistent sample size calculator. ClinCalc sample size calculator (available at www.clincalc.com) utilizes equations to determine the minimum number of subjects that need to be enrolled in a study in order to have sufficient statistical power to detect a treatment effect.[64]

Moreover, half of the reviewed studies used convenience sampling at any stage of the sampling process, which is a type of nonrandom sampling of participants that meets certain practical criteria, such as easy accessibility, geographical proximity, availability at a given time, or the willingness to participate.[65] This type of sampling method is prone to bias and may lead to the under-representation or over-representation of particular groups within the sample.[66] Hence, it might be useful for future studies to randomly select the participants across the entire country to overcome concerns related to generalizability and to increase the significance level of the findings.

The outcomes measures and major findings of the included studies

It was found that some studies that reported the pharmacy and pharmacy staff related information, gave critical information like professional status and age of the participants by estimation. Reporting pharmacy and pharmacy-related information are important in addressing the factors that affect the CP performance. However, estimation is not always accurate and is prone to biases. One study by Norja, R. et al. concluded that the ability of individuals to estimate the age of adolescents is generally low.[67] Although, in some countries in the MENA region the law mandates that medication dispensing services should be performed by or under the supervision of licensed pharmacists, the professional status of the participants should be confirmed by checking the identification tag or asking to talk with the pharmacist particularly to share with them the patient complains. In addition, age should be confirmed by asking the authorized representative of the pharmacy or through surveys.

Moreover, the vast majority of the reviewed studies reported unsatisfactory results regarding the performance of the pharmacy staff. It is worth noting that, satisfactory results were mainly concluded by studies that use surveys along with the SP methodology. In fact, one study that used SP and survey-based methodology found the presence of a knowledge-practice gap between participants after analyzing the results of the SP and the survey. This may be explained by the fact that findings from survey-based research, although they provide a useful baseline, they are restricted by social desirability bias, which occurs when participants hide their real practices to appear more desirable to the surveyors. In the field of psychology, this behavior is identified as the Dunning–Kruger phenomenon, which assumes that unskilled people tend to inflate their abilities and performance more than do those who are more skilled.[68] The SP methodology, however, offers the advantage of overcoming bias due to the Hawthorne effect (also referred to as the observer effect), where individuals may alter their behavior because of their consciousness of being observed.

The characteristics of the simulated patient and simulated visit

Terms used to describe the individuals used to perform the visits were found to be inconsistent across the included studies. This finding correlates fairly well with recent systematic

reviews by Björnsdottir et al and Mesquita et al.[11,14] This lack of uniformity in the studies can generate confusion and difficulty in expanding the use of this approach in pharmacy practice settings. So, standardization of terminology would be helpful to assist in the identification of future studies that use this technique.

Moreover, only one SP was involved in most studies 35 (77.8%). Although the results from studies that use only a few SP may be more limited and less generalizable than other studies that use greater numbers of SP, this may be considered a strength in terms of consistency, standardizing the approach, and minimizing inter-rater variability. This concern can be eliminated if the pharmacy was visited more than once. Evaluating the same pharmacist more than once may give an accurate view of the quality of services the pharmacies provide and may confirm and validate the behavior and practices of pharmacists. However, visiting the same pharmacy by the same SP more than once may lead to the detection of the SP. Many ways can be applied to minimize the detection of the SP. Some of the included studies reported that the SP purchased the drug that was recommended to authenticate the interaction.

Data were recorded using written form immediately after the visit in most of the studies. This finding was in accordance with the findings of two systematic reviews.[12,13] In fact, the use of self-completed questionnaires is the most common method of data collection in pharmacy practice research in general.[69] However, problems can arise because of time separation between observation and data recording with regards to poor recall abilities. This concern can be addressed by recording the data immediately after the visits to minimize potential biases associated with missing information (both omissions and distortions). In addition, the use of a standard written form, accompanied by audio recording might be helpful in validating the manually documented data and minimizing the recall bias rather than relying entirely on the SP. However, the audio recording may pose some ethical concerns. To overcome concerns related to ethical approval and ensure validation of recorded data, some included studies employed two persons for each simulated visit. One is the SP who`s responsible for performing the scenario and the other is an observer who's responsible for observing the interaction between SP and CP without engagement.

Our review reported that the performance feedback was delivered in only six studies. It is useful for a person to get information regarding the degree to which his or her actual performance resembles expected behavior in order to assess opportunities for improvement. The provision of performance feedback enhances the engagement of SP as an assessment tool and as an educational tool. This optimizes CP practice by addressing needed areas of improvement and serves as a useful way of refining practice skills.

In addition, it was evident in our review that although the majority of the reviewed articles conducted a training session for the SP, few of them reported the details of the training session. Similar findings were reported by Björnsdottir et al.[14] The training details offered to SPs need to be reported properly. The extent of training required varies depending on the case's complexity, but without information on the training offered, the reader is unable to assess the quality of the training. Rigorous and extensive training can eliminate the subjectivity of the SP evaluation if only one SP is employed. Also, it can help to minimize the interindividual variability if more than one SP were employed by ensuring the quality and the consistency of the scenario and SP performance. Training can also impact the validity and reliability of the results of SP studies. In an online survey of 85 SPs in the United Kingdom, nearly 97.5% had received training, and there were considerable variations in the type, extent, and content of the training received.[70] The pilot study also served as a practice session for the SPs to improve their professional practice and produce a real-life scenario while performing as SPs in the main study. During training, SP should be trained to use lay language and refrained from using any jargon during visits. This is to avoid any possibility of language bias since some pharmacists might perform better when using their mother tongue.

The characteristics of the employed scenarios

The target drug or condition studied varies greatly and reflects the complexity of problems people present at pharmacies. Also, this reflects the adaptability of SP methodology to different scenarios. However, it is interesting to note that studies mainly have had a specific focus on minor conditions (i.e., common cold) rather than major conditions (i.e., cardiovascular diseases). This highlights the lack of studies assessing the pharmacists' ability to deal with major problems. It might be useful to promote future use of SP methodology in practice evaluation and professional development, as it seems to be an accurate and ideal method for assessing the pharmacists' real-life behavior.

Ethical considerations

The SP methodology may be seen as an ethically dubious method since participating pharmacists do not give their consent to participate. The number of studies reporting that consent to participate was obtained from the participants or the authorized representative of the pharmacy is high compared to finding by Björnsdottir et al,[14] reflecting the growing awareness about research ethics and the development of processes for ethical oversight in many MENA region countries. Consent to participate (direct or indirect) might be important to allow the pharmacists the choice to participate. Some researchers claimed that waiving consent to participate is justifiable in such studies since it has an anticipated minimal risk to participants and the research can generate socially valuable information while protecting participants' identity. However, efforts should be made to minimize the Hawthorne effect and the detection of the SP. This may be done by allowing sometime between the consent and the SP visiting day. Also, it is important not to disclose the characteristic of the SP, the details of the scenario, and the time of the visit. In addition, it is recommended to obtain consent by someone other than the SP responsible for roleplaying the scenario before the visit takes place, most often months before the visits.

Implications

In developing countries, pharmacists often serve as the first contact for the patient and the last before taking the drugs dispensed. So, it is crucial to assess their competencies and practice. We anticipate that the use of SPs in pharmacy practice research can be a useful tool for obtaining valid and reliable outcomes that are difficult to be obtained using other methods. The current review provides new and in-depth insights into the use of SP methodology in the MENA region countries. Greater knowledge of the SP methodology can help in conducting the SP methodology in an ideal situation. The results highlight several areas where future studies that use SP methods yield higher quality results, for instance by considering the information provided in the Discussion section.

Strengths and limitations

A vital strength of our review is the heterogeneous nature of the reviewed studies, in terms of the measured outcomes, which augments the generalizability of the review results to the countries of the MENA region. Moreover, the assessment of the quality of the study design, and data collection and extraction, fulfill well-recognized international methodologies. Another strength of this study is the inclusion of multiple secondary databases which can provide comprehensive results.

Despite efforts made to achieve a comprehensive review, there were several limitations. First, because of the many synonyms for the term "simulated patient", some studies may have been overlooked during the search. However, all the relevant terms were identified by an extensive literature search prior to starting this review. Secondly, researchers included Google scholar only through manual research due to multiple limitations, such as limitation of the research words, the inability to directly export results in bulk as citations, and the display of only the first 1,000 search records. Hence, some studies that would have met inclusion criteria could have been left out of the review. Thirdly, the search strategy was restricted to English publications which may result in excluding non-English articles, therefore relevant studies published in languages other than English could have been overlooked. Fourthly, grey literature was excluded which may have resulted in some bias in the findings.

CONCLUSION

This review systematically explored the use of the SP method in 45 studies in the community pharmacy setting in the MENA region. The results of this review show the broad range of pharmacy services for which this method was used to derive and assess different outcomes. However, there was high variability in the level of reporting the study methodology between studies. Consequently, we argue that the need for a clear standardized reporting of the studied not only to enable researchers to easily adopt it but also to improve the quality and consistency of SP studies. In addition, studies were published in almost half of the countries of the MENA region. It would be interesting to widen the use of this method out to other countries.

CONFLICTS OF INTEREST

None.

FUNDING INFORMATION

None.

AUTHOR CONTRIBUTIONS

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Supplementary Table

Table 1. Main outcomes measures and major findings (arranged chronologically)

Author, Year	Outcomes measures	Major findings
(Al-Faham et al., 2011)	Drug use	Irrational drug use
(Alomar et al., 2011)	Skills (pre-dispensing and post-dispensing)	Inadequate skills
(Khan and Azhar, 2012)	Knowledge level	Low knowledge
(Osman et al., 2012)	Skills (post-dispensing), knowledge level	Inadequate skills, Low knowledge
(Al-Worafi, 2015)	Knowledge level	Low knowledge
(Alaqeel and AbaNMy, 2015)	Skills (pre-dispensing and post-dispensing), self-reported skill, barriers to counseling	Inadequate skill, adequate self-reported skill, barriers (lack of time and inaccessibility to the patient medical history)
(Kashour et al., 2015)	Skills (pre-dispensing and post-dispensing), drug use	Inadequate skill, irrational drug use
(Foroutan and Dabaghzadeh, 2016)	Skills (pre-dispensing and post-dispensing)	Inadequate skills
(Ibrahim et al., 2016)	Skills (pre-dispensing and post-dispensing), drug use, cost level	Inadequate skill, irrational drug use, cost level (NR)
(Atia and Abired, 2017)	Skills (pre-dispensing and post-dispensing), drug use	Inadequate skill, irrational drug use
(Dabaghzadeh and Hajjari, 2017)	Skills (pre-dispensing and post-dispensing)	Inadequate skills
(Mohamed Ibrahim et al., 2017)	Skills (pre-dispensing and post-dispensing), drug use, cost level	Inadequate skill, irrational drug use, high-cost level
(Paravattil et al., 2017)	Skills (pre-dispensing and post-dispensing), barriers to counseling, knowledge level	Inadequate skill, low knowledge, barriers (lack of time and patient is not interested)

(Hammad et al., 2018)	Skills (pre-dispensing and post-dispensing), drug use, communication skills	Inadequate skill, irrational drug use, inadequate communication skills
(Ibrahim et al., 2018)	Skills (pre-dispensing and post-dispensing), drug use, cost level	Adequate pre-dispensing skill, inadequate post-dispensing skill, rational drug use, cost level (NR)
(Mahmoud et al., 2018)	Skills (pre-dispensing and post-dispensing), drug use	Inadequate skill, irrational drug use
(Mikhael et al., 2018)	Skills (post-dispensing)	Inadequate skills
(Zolezzi et al., 2018)	Skills (pre-dispensing and post-dispensing), communication skills, perceived preparedness, barrierst to counseling and management	Inadequate skills, inadequate communication skills, high perceived preparedness, barriers (lack of time, inadequate space, and lack of support)
(Abdelaziz et al., 2019)	Skills (pre-dispensing), drug use, self-reported skill, knowledge level, attitude level	Inadequate skill, irrational drug use, adequate self-reported skill, high knowledge, high attitude
(Al-Worafi et al., 2019)	Knowledge level	Low knowledge
(Elayeh et al., 2019)	Skills (post-dispensing), effectiveness of educational workshop on pharmacists' skills	Inadequate skill, effective educational workshop
(Khojah, 2019a)	Privacy level, number of pharmacists	Low privacy level, insufficient number of pharmacists
(Khojah, 2019b)	Skills (pre-dispensing and post-dispensing)	Inadequate skill
(Mobark et al., 2019)	Skills (pre-dispensing and post-dispensing), drug use	Inadequate skill, irrational drug use
(Wazaify et al., 2019)	Skills (pre-dispensing and post-dispensing), drug use, communication skills	Inadequate skill, irrational drug use, communication skills (NR)
(Yaacoub et al., 2019a)	Skills (pre-dispensing and post-dispensing), drug use, conformity rate to international guidelines	Inadequate skill, irrational drug use, low conformity rate to international guidelines
(Yaacoub et al., 2019b)	Skills (pre-dispensing and post-dispensing), drug use, conformity rate to international guidelines	Inadequate skill, irrational drug use, high conformity rate to international guidelines
(Al Qarni et al., 2020)	Skills (pre-dispensing and post-dispensing)	Inadequate skill
(Al-Amad et al., 2020)	Diagnosis, drug use	Improper diagnosis, irrational drug use
(Al-Tannir et al., 2020)	Skills (pre-dispensing and post-dispensing), drug use	Inadequate skills, rational drug use
(Atia, 2020)	Skills (pre-dispensing and post-dispensing)	Inadequate skills
(Halboup et al., 2020)	Skills (pre-dispensing and post-dispensing), drug use	Inadequate skills, rational drug use
(Palaian et al., 2020)	Skills (pre-dispensing and post-dispensing), professional collaboration	Inadequate skill, low professional collaborations
(Rashid et al., 2020)	Skills (pre-dispensing and post-dispensing)	Inadequate skills
(Soltani et al., 2020)	Skills (pre-dispensing and post-dispensing), drug use	Inadequate skills, rational drug use
(Al-Qudah et al., 2021)	Skills (pre-dispensing and post-dispensing), diagnosis	Inadequate skills, improper diagnosis
(Hamadouk et al., 2021)	Skills (pre-dispensing and post-dispensing), drug use	Inadequate skills, irrational drug use
(Hasan et al., 2021)	Skills (pre-dispensing and post-dispensing)	Inadequate skills
(Itani et al., 2021)	Skills (pre-dispensing and post-dispensing), communication skills	Inadequate skills, inadequate communication skills
(Tawfik et al., 2021)	Drug use	Irrational drug use
(Alzubaidi et al., 2022)	Skills (pre-dispensing and post-dispensing), and communication skills	Inadequate skills, inadequate communication skills
(Hamadouk et al., 2022)	Skills (pre-dispensing and post-dispensing)	Inadequate skills
(Hammad et al., 2022a)	Skills (pre-dispensing and post-dispensing), privacy level, acceptability of the SP visit, communication skills	Inadequate skills, high privacy level, positive acceptability of the SP visit, adequate communication skills
(Hammad et al., 2022b)	Skills (pre-dispensing and post-dispensing), privacy level, acceptability of the SP visit, communication skills	Inadequate skills, high privacy level, positive acceptability of the SP visit, inadequate communication skills
(Karout et al., 2022)	Skills (pre-dispensing and post-dispensing), communication skills	Inadequate skills, inadequate communication skills