

1 **Abstract**

2 **Objectives** This study aim to evaluate published original studies in Saudi Arabia about
3 knowledge, attitude, roles and practices of community pharmacists in providing patient
4 centered care services.

5 **Methods** Systematic searching of original studies published between 1st January 2007 and
6 31st December 2017 using electronic databases: PubMed, International Pharmaceutical
7 Abstracts (IPA), Scopus, Science Direct, Cochrane Library, TRiP database, Springer Link, and
8 Google Scholar. Studies were included if they outlined community pharmacist’s knowledge,
9 role, attitude and professional practice behaviors toward patient-centered care provided by
10 pharmacists alone or in collaboration with other health care professional (s). The studies were
11 identified and data was extracted independently by two reviewers. The modified Newcastle-
12 Ottawa scale for cross-sectional studies was used to assess the quality of each study.

13 **Key Findings** Twenty-four original studies conducted in Saudi Arabia were included.
14 Majority of studies were questionnaire-based surveys (62.5%). One quarter of the studies
15 investigated knowledge, roles and attitude of community pharmacists about irrational
16 dispensing and prescribing of antibiotics and prescription only medicines. Included studies
17 highlighted numerous gaps in knowledge, attitude, roles and practices of community
18 pharmacists in Saudi Arabia in providing efficient patient-centered care services. Lack of
19 knowledge and time, absence of pharmacy information database, deficiency of continued
20 professional development training, unavailability of adverse drug reaction reporting forms,
21 and professional and cultural issues were some of the barriers in providing patient-centered
22 care.

23 **Conclusions** The studies showed that though community pharmacists in Saudi Arabia do
24 provide medicine counselling and other patient-centered care services, however these
25 services need substantial improvement. This review may be useful for policy makers,
26 regulators, pharmacy educators and researchers in understanding the work being done in the
27 community pharmacy setting in Saudi Arabia.

28 **Keywords:** Community pharmacy, knowledge, patient-centered care, practices,
29 Saudi Arabia

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34 Introduction

35 The Kingdom of Saudi Arabia is a high-income country with a population of approximately 27
36 million and GDP per capita, PPP of US \$54416¹⁻³. Ministry of Health (MOH) of Saudi Arabia
37 provides free healthcare services and free of cost medicines to all citizens through primary,
38 secondary and tertiary health care facilities³. The extensive health care system of Saudi Arabia
39 is facing challenges from a growing burden of non-communicable chronic diseases
40 (hypertension, obesity and diabetes) which accounts for 71% of all mortality in Saudi Arabia
41^{2,4,5}. In addition, the urban population growth and socio-economic indicators in Saudi Arabia
42 are leading to unhealthy eating habits, increased tobacco consumption and lifestyle-related
43 communicable diseases². Therefore, demand for health care services such as periodic check-
44 up of risk factors, monitoring of diseases and early disease detection is increasing^{2,4,5}.

45 The vision 2030 of Saudi Arabia is a broad comprehensive plan for reforming the entire
46 economic structure of Saudi Arabia. Regarding healthcare, the vision 2030 of Saudi Arabia
47 emphasizes on increasing private sector share of providing and improving primary healthcare
48 services⁶. As a result, the government of Saudi Arabia has taken measures to deal with the
49 growing demand for primary healthcare from society. The ministry of health of Saudi Arabia
50 has introduced Saudi Health Strategy in 2009, which focuses on supporting information
51 systems in the health care sector and ensuring the quality and efficiency of health care
52 services. The ministry of health is also promoting public-private health care partnership to
53 relieve the pressure on the ministry of health in providing continually demanding efficient
54 public healthcare system^{7,8}.

55 In Saudi Arabia, about 6000 privately owned community pharmacies offer dispensing of a
56 wide range of pharmaceuticals^{7,8}. These community pharmacies can play a vital role in
57 providing patient centered care services to patients^{4,5,9}. However, there is a need to revamp
58 and reorganize community pharmacist's professional role in providing patient centered care
59 services effectively. In comparison with other developed and high-income countries, the
60 patient centered care is in infancy stage in Saudi Arabia^{2,4,10}.

61 The MOH of Saudi Arabia ensures that that community pharmacists in Saudi Arabia follow its
62 rules and regulations of drug dispensing and counselling. However, it is a common practice
63 among community pharmacists to dispense prescription only medicines without a
64 prescription from a physician. Medicines are easily accessible to the public and dispensed
65 without proper counselling that could lead to potential harm to patients^{2,4,8,10}.

66 This systematic review documents the studies which evaluate community pharmacist's roles,
67 attitudes, knowledge and professional practice behaviors towards patient-centered care in
68 Saudi Arabia. This is important in the context to assess the situation in the primary care setting
69 across Saudi Arabia. The study findings would be useful to promote better community
70 pharmacy practice in the country.

71 **Methods**

72 **Scope of Review: Eligibility Criteria**

73 PRISMA guidelines were followed in preparing and reporting this systematic review ¹¹. The
74 review protocol was registered with PROSPERO [Registration number CRD 42017073705] ¹².
75 The key themes were community pharmacist's knowledge, attitude, professional roles and
76 practices towards patient-centered care in Saudi Arabia. The activities included in the scope
77 of patient-centred care in this systematic review include community pharmacist's effort to
78 promote health, prevent, detect healthcare related problems and promote self-monitoring of
79 diseases by patients. The primary outcome measures include community pharmacist's
80 knowledge, roles, attitude and professional practice behaviors. Studies reporting community
81 pharmacist's views regarding barriers to providing patient-centered care were also screened

82 Original research articles of either survey-based and/or simulated patient methodology were
83 included if they report one or more of the primary outcomes. The studies were excluded if
84 they do not aim to investigate community pharmacist's knowledge, attitude, roles and
85 professional practices in providing patient-centered care in Saudi Arabia. They were also
86 excluded if they were not available in full text, was not in English language and published
87 before 1st January 2007. Studies with no clear details on community pharmacist's roles,
88 attitude, knowledge and practices and those investigating both community and hospital
89 pharmacists were excluded. The studies included were published in past 10 years (2007-
90 2017). We also excluded conference proceedings or abstracts, letters to the editors and short
91 communications.

92 **Information Sources**

93 A literature search of published articles from 1st Jan 2007 till 31st December 2017 was
94 undertaken between 1st November 2017 till 28th February 2018 in seven health-related
95 databases: PubMed, Science Direct, ProQuest central (IPAs), Cochrane Library, Google
96 Scholar, Scopus, and Turning Research into Practice (TRiP) database. Reference lists of articles
97 identified in the search and relevant review articles were included and were subject to the
98 same eligibility evaluation.

99 **Searching**

100 The search strategy identified research on knowledge, roles, attitudes and practice involving
101 community pharmacists in providing patient-centered care. The lead author searched
102 following keywords: "community pharmacy" or "pharmacy practice" or "community
103 pharmacist" or "healthcare system" or "retail pharmacy" or "community pharmacy services"
104 or "pharmaceutical care" or "community pharmacist's knowledge" or "community
105 pharmacist's attitude" or "community pharmacist's role" or "community pharmacist's
106 practices" and "Saudi Arabia". Titles and abstracts were screened to remove studies that

107 were clearly irrelevant to the aim of the review. The full texts of the remaining studies were
108 then examined to determine eligibility.

109 **Study Selection**

110 Two investigators (MKR and ZUB) assessed abstracts independently against eligibility criteria.
111 Studies were conducted in community pharmacy settings with the involvement of
112 pharmacists, and reported in English. Full papers of potential studies were independently
113 assessed by the 2 investigators for their suitability. Studies involving the pharmacists in
114 hospitals or other care settings were excluded as the nature and impact of the involvement
115 could vary. After hand searching of retrieved studies for duplicate records, the remaining
116 studies were screened at the title and abstract level by two authors. The two authors
117 reviewed all the studies against the study eligibility criteria and were scrutinized by the lead
118 author to check relevance to community pharmacist's knowledge, attitudes, roles and
119 practices in providing patient centered care to patients in Saudi Arabia. All studies selected
120 for this systematic review were screened by two reviewers independently to validate the
121 results. Any difference of opinion or disagreement between the authors over the eligibility of
122 a particular study was agreed through mutual discussion.

123 **Data Collection Process**

124 The data from all the retrieved studies were subsequently collected and tabulated using a
125 form developed by the lead author that was verified by the second reviewer. Extracted
126 information from studies is mentioned in Table 1. The extracted information included study
127 design, study participants and settings, objectives of the study, response rate and sample size,
128 outcomes measured, summarized results and main findings of the study. Criteria for quality
129 assessment of included studies in this systematic reviews were based on those of the NHS
130 Centre for Reviews and Dissemination (CRD) ¹².

131 **Assessment of Quality and Risk of Bias in Included Studies**

132 All authors showed 100% agreement in assessing the risk of bias in all 24 studies through
133 modified Newcastle-Ottawa Scale for cross sectional studies. All authors also agreed in
134 assigning points for the bias assessment. The lead author independently assessed the risk of
135 bias of each of the included studies and discussed their assessments with other two authors
136 to achieve consensus. The modified Newcastle-Ottawa Scale was selected because it was
137 easier to use and considered reliable to measure biasness in cross-sectional studies ¹³⁻¹⁵. Each
138 of the 24 selected studies was evaluated for selection, performance and detection and
139 information bias. The lead author rated each paper using the NOS scale to assess methods for
140 selecting study participants, methods to control confounding, using appropriate statistical
141 methods and methods for measuring outcome variables. The legend of the scale ranges from
142 0 to 3, in which a score of 0 represents a high risk of bias and a score of 3 represents a low
143 risk of bias.

144 **Results**

145 **Search Results and Study Characteristics**

146 The search yielded 211 unique abstracts. After application of eligibility criteria and removal
147 of duplicate records, 28 studies were included. Of these, 4 studies were also excluded because
148 they measured both community and hospital pharmacists' roles. Finally, 24 studies were
149 selected and included for analysis in this systematic review (Figure 1).

150 Twenty-four studies met the inclusion criteria of this systematic review. The Figure 1
151 illustrates the study selection process and Table 1 summarizes the studies included in this
152 systematic review. The majority of studies were conducted in Riyadh ^{19,20,22,23,27,28,31,37}
153 followed by five in Al-Ahsa ^{16,17,33,36,38}, and three in Al-Qassim region of Saudi Arabia ^{26,32,34}.
154 Two studies were performed in Makkah/Jeddah region ^{10,18}. One study was performed each
155 in Al-Kharj ²⁴, Madina ²⁵ and Dwadmi ³⁰. Three studies were conducted in multiple cities in
156 Saudi Arabia. One study was conducted in Riyadh, Buraydah and Hail ²¹, one in Riyadh and
157 Jeddah ³⁵ and one in Riyadh, Jeddah, Makkah and Madina ²⁹. Majority of studies were
158 questionnaire-based surveys ^{16,17,26-30,18-25}. Five studies used simulated patient methodology
159 ³¹⁻³⁵, while two studies used face to face interview and questionnaire-based survey as their
160 evaluation method ^{36,38}. The remaining two studies used both questionnaire based survey and
161 simulated patient methodology ^{10,37}. Three questionnaire based survey studies had a
162 response rate of less than 70% ^{25,26,29}, among them one had a response rate of only 36% ²⁵.
163 One study did not report the response rate at all ³⁰.

164 Majority of studies in this review investigated the knowledge, role and attitude of community
165 pharmacists about irrational dispensing and prescribing of antibiotics and over the counter
166 drug dispensing ^{10,18,25,31,36,38} followed by the counselling practices of community pharmacists
167 ^{27,32,35,37}. Three studies investigated the knowledge of community pharmacists about proper
168 use of inhalers ^{30,33,34} and three studies explored the attitude and practices of adverse drug
169 reaction reporting by community pharmacists in Saudi Arabia ^{17,22,24}. Community pharmacist's
170 knowledge and practices of pharmaceutical care were evaluated by two studies ^{26,29}. There
171 were five studies which targeted specific areas of pharmaceutical care like community
172 pharmacist's knowledge attitude and practices to provide medication counseling and patient
173 education in oral health, herbal products, pregnancy and mental illnesses ^{19-21,23,28}. All studies
174 included in this review represented community pharmacist's knowledge, role, attitude and
175 professional practices toward the patient centered care.

176 **Outcome evaluation**

177 Four main outcomes of community pharmacist's knowledge, role, attitude and practice
178 toward patient centered care were identified and their analysis were carried out accordingly.
179 Most of the included studies in this systematic review evaluated more than one outcome
180 which is mentioned in Table 1.

181 **Pharmacist's knowledge of patient centered care**

182 Two studies observed that community pharmacist's had inadequate knowledge to educate
183 patients with asthma on correct use of inhalers^{33,34}. Another study showed similar results,
184 however, the majority of community pharmacists in that study considered their basic
185 knowledge about asthma as satisfactory³⁰. Three studies reported that adverse drug
186 reactions are under reported by community pharmacists and only a small number (10-22%)
187 of community pharmacists were even familiar with the adverse drug reaction reporting
188 process in Saudi Arabia^{17,22,24}.

189 One study by Alrabiah et al., (2017) found that only 54% of the community pharmacists ask
190 female patients about pregnancy status before dispensing medicines²⁰. Similarly, another
191 study showed that only 53% of the community pharmacists surveyed had knowledge about
192 the correct pregnancy risk category of medicines²¹. Al-Kharfy et al., (2010) reported that
193 despite the high proportion of herbal medicine use in community pharmacies of Saudi Arabia,
194 the knowledge of community pharmacists about the safety of herbal medicines and herb-
195 drug interactions was moderate²⁸. A study done by Abdulhak et al., (2011) showed that
196 majority of the surveyed community pharmacists lacked the appropriate knowledge to
197 provide effective counseling while dispensing antibiotics³¹.

198 The majority of community pharmacists cited lack of time and deficiency of continue
199 professional development training as main barriers in providing appropriate medication
200 counseling to patients^{19,30,34}.

201 **Pharmacist's attitude toward the patient centered care**

202 The majority of community pharmacists in Saudi Arabia did not recognize that irrational use
203 of antibiotics by patients can cause potential harm and could lead to antimicrobial resistance
204^{18,36}. One study revealed that only 26.5% of community pharmacists felt confident in providing
205 oral health advice to patients¹⁶. Similarly, in another study medication counseling provided
206 to simulated cardiac patients were found to be inadequate³⁵. Another study reported that
207 more than half of community pharmacists (56%) expressed concern about the safety of herbal
208 products²⁸. In an another study, majority of community pharmacists dispensed psychotropic
209 medications upon patient's request without a prescription and without understanding the
210 potential harm that may cause to the patients¹⁰. In two studies, most of the participating
211 community pharmacists believe that the adverse drug reaction reporting is the responsibility
212 of the physician or the hospital pharmacist^{22,24}.

213 A study by Gillani et al., (2017) performed in four major cities of Saudi Arabia with a sample
214 size of 1257 community pharmacists found that almost two-third of the surveyed pharmacists
215 (66%) refused to provide pharmaceutical care services citing lack of knowledge and pharmacy
216 information database²⁹. By contrast, another study showed a positive attitude in providing
217 the patient centered care towards mentally ill patients, however, community pharmacists felt
218 uncomfortable in counseling and following up of mentally ill patients in the study²³.

219 **Pharmacist's role in the patient-centered care**

220 Two studies reported that despite acknowledging that reporting adverse drug reaction is part
221 of the professional role of the community pharmacist, the majority of them didn't report
222 adverse drug reactions observed by patients ^{22,24}. Similarly, four studies in this systematic
223 review also showed that community pharmacists performed irrational prescribing and
224 dispensing of antibiotics ^{18,25,34,36}.

225 A study done by Al-otaibi et al., (2016) assessed that the role of community pharmacist in
226 managing asthmatic patients was inadequate ³⁰. Nine studies performed in different cities
227 and regions of Saudi Arabia observed that the role of community pharmacists in providing
228 effective medication counseling to pregnant women, cardiac and patients with diabetes and
229 mentally ill patients specifically was limited and deficient of patient-centered care practices
230 ^{16,19–21,23,26,27,35,38}.

231 **Pharmacist's professional practice behaviors with respect to patient-centered care**

232 Although community pharmacists in Saudi Arabia were approached frequently by the patients
233 for advice on health and drug related problems, only a few of the community pharmacists
234 surveyed provided appropriate medication counseling and health related advice to patients
235 ^{26,37}. The majority of community pharmacists in their current practice did not report adverse
236 drug reactions to the MOH of Saudi Arabia ^{17,22}. Studies in this systematic review showed that
237 majority of the surveyed community pharmacists dispensed and prescribed antibiotics,
238 antipsychotics, antihypertensive, anti-diabetics and other non-over the counter medications
239 upon patient's request only and without a prescription from a physician ^{18,20,25,27,29,31,33,35–37}.
240 A study by Abdulhak et al., (2011) observed that majority of the community pharmacists
241 dispensed antibiotics for common infections without asking about the associated symptoms
242 ³¹. Another study done by Alfadl., (2018) et al reported that medication counseling skills of
243 the majority of surveyed community pharmacists were of the poor standard ³². It was
244 observed by Nahid et al., (2016) that taking patient history before dispensing medications was
245 performed by half of the community pharmacists, while only 16.5% asked about medication
246 allergy history and only 12.5% monitored the outcome of patient's drug therapy ²⁶. By
247 contrast, one study showed that 89% of the community pharmacists asked about pregnancy
248 status before dispensing a medication which can have an adverse effect on pregnant patients
249 ²⁰. In another study, Bawazir et al., (2014) observed that majority of community pharmacists
250 provided medication counselling to patients based on their personal experiences with the
251 medicine rather than scientific knowledge ¹⁹.

252 **Risk of bias in included studies**

253 Four studies ^{24,30,36,38} in this systematic review were thought to be unrepresentative of the
254 general population because they included a small sample population size of community
255 pharmacists. Half of the selected studies ^{16,19,34,36,38,21,22,24,26,27,30–32} in this systematic review
256 received a high risk of detection bias for assessment of statistical methods in studies because

257 it is thought that they didn't use statistical methods appropriately. Seven studies
258 ^{19,24,26,27,30,34,36} received high risk of bias in the assessment of their outcomes.

259 **Discussion**

260 The present study found that community pharmacists in Saudi Arabia are frequently
261 approached by patients and the general public to seek health related advice, medication
262 counselling and for multiple drugs or disease related problems ^{16,17,23,29-31,38}. However, the
263 knowledge and attitude of the majority of community pharmacists in Saudi Arabia are
264 inadequate and unsatisfactory to provide quality patient centered care services ^{27,29}. By
265 contrast, a study by Salah Abu Ruz et al., (2012) evaluated that community pharmacists in
266 Jordan have very good attitude and understanding of the pharmaceutical care ³⁹.

267 This review documented that community pharmacists in Saudi Arabia provide inadequate and
268 poor quality medication counseling and instructions on medicines to patients ^{16,26,29,33-35,37,38}.
269 Similar results were found in a previous study done by Hasan et al., (2012) in the United Arab
270 Emirates, which reported that only 28% of the surveyed community pharmacist provided
271 medication counseling to patients ⁴⁰. In comparison, a previous study by van Eikenhorst et al.,
272 (2017) reported that community pharmacists in the United Kingdom and other developed
273 countries do provide medication counseling but only to a limited number of patients ⁴¹.
274 Providing appropriate medication counselling and instructions to patients, for example,
275 proper inhaler techniques to achieve therapeutic outcomes is a vital area for pharmacists for
276 further improvement.

277 The results of this review evaluated that majority of community pharmacists had insufficient
278 knowledge of the pharmacy laws and regulations regarding adverse drug reaction reporting
279 in Saudi Arabia. As a result, the majority of community pharmacists are not aware of adverse
280 drug reaction reporting procedures of the MOH of Saudi Arabia. Hence adverse drug reactions
281 are either under reported or not reported at all by community pharmacists ^{17,22}. This is very
282 different in Canada where the majority of community pharmacists are familiar with adverse
283 drug reaction reporting process and almost two third of them report it as well ⁴².

284 This review assessed that the community pharmacist in Saudi Arabia commonly prescribes
285 and dispenses a wide variety of prescription only medications such as but not limited to
286 antibiotics, cardiovascular and antidiabetic medications ^{16,18,19,34,35}. This is consistent with the
287 practice of community pharmacists in other parts of the Middle East where prescription only
288 medicines are dispensed without prescription quite commonly ^{43,44}. This practice could lead
289 to misuse of medicines, treatment failures, over or under dosage, unnecessary costs and
290 antimicrobial resistance in Saudi Arabia.

291 This review evaluated that the majority of the community pharmacists in Saudi Arabia is of
292 the view that they need additional training and continued professional programs to deliver
293 patient centered care effectively ^{17,19,26,27,29,31,35,37}. One of the study in this review found that

294 continue professional development of community pharmacists are necessary because
295 overwhelming majority of them are expatriates with diversity in educational background and
296 training from their respective countries²⁹. According to the results of this review, specific area
297 of continue professional development need to be targeted that can be beneficial for
298 community pharmacists in providing adequate patient centered care.

299 The results of this review showed that majority of community pharmacists cited logistical
300 barriers like unavailability of adverse drug reaction reporting forms, lack of time and
301 professional environment and cultural barriers as main barriers in providing effective patient
302 centered care services^{24,26,27,29-32,38}.

303 Future research is needed around issues such as factors impacting pharmacist's attitude as
304 well as what constitute better knowledge and skills for pharmacists' care services in Saudi
305 Arabia. Knowledge gaps can then be identified to determine relevant and specific continued
306 professional development programs for their training and development of clinical
307 competencies.

308 **Limitation of the review**

309 There were very few studies in Saudi Arabia on the topic depicting that more mature validated
310 work is needed on the issue. Some of the included studies either had the poor sample size,
311 inadequate statistical measurements, poor response rate or inappropriate outcomes. This
312 may lead to inconsistencies in the survey findings.

313 **Conclusion**

314 The studies showed that though community pharmacists in Saudi Arabia do provide medicine
315 counselling and other patient-centered care services, however these services need
316 substantial improvement. This review may be useful for policy makers, regulators, pharmacy
317 educators and researchers in understanding the work being done in the community pharmacy
318 setting in Saudi Arabia.

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