

Medical Devices-Related Counseling Practices Among Community Pharmacists: A Nationwide Cross-Sectional Study from Saudi Arabia

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Objective: The current study was conducted to assess medical devices-related counseling practices among community pharmacists in Saudi Arabia.

Methodology: This was a cross-sectional study conducted among community pharmacists from Saudi Arabia using a convenience sampling technique. An online questionnaire based on Google forms was used to collect data. Descriptive and inferential analyses were conducted using SPSS statistics 22. Student *t*-test, one way ANOVA, and Pearson correlation statistics were used where applicable. Results with a *p*-value of <0.05 were considered statistically significant.

Results: One thousand and six community pharmacists responded to the survey. Males' rating of their ability to operate medical devices was significantly higher than females (overall average score of 3.8 versus 3.5, *p*=0.033). As years of experience increased there were slight but significant increases in the overall scores on ability to operate medical devices (*p*=0.002) and confidence to counsel patients about the devices (*p*=0.032). Those who got a board certification used devices for self-treatment significantly more than their counterparts (on average 6.9 devices versus 5.2, *p*=0.003). Those who received clinical training reported higher rates of ability to use/operate devices (*p*=0.011), confidence to counsel patients on devices (*p*=0.001), and counseling practice (*p*=0.044) than those who did not receive clinical training.

Conclusion: The present study revealed good to very good self-reported medical devices-related counseling practices. There is a need for more future rigorous research to evaluate pharmacists' actual practice in this area. Pharmacy educators and CPD programs should pay attention to updating pharmacists' knowledge and skills and improve their contribution to medical devices supportive services.

Keywords: community pharmacists, correlations, counseling practices, medical devices, Saudi Arabia

Introduction

Patients counseling represents a core part of classic and modern pharmacists' roles.¹⁻⁵ It has been documented and assessed worldwide and has been applied on both general pharmaceutical care and health⁶⁻⁹ and for caring about specific patients' conditions and needs.¹⁰⁻¹³ However, the literature on community pharmacy services and pharmacists' counseling practices in Saudi Arabia revealed conflicting findings. A substantial proportion of such literature showed poor patterns of practice, whereas some studies indicated clear positive and satisfactory findings. For example, Alanazi et al¹⁴ conducted a review on the literature

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documenting pharmaceutical care in community pharmacies in Saudi Arabia and reported that dispensing of medicines is the only service provided by community pharmacists with very limited scope of other pharmaceutical care services. Alfadl et al¹⁵ conducted a study on medication counseling practice at community pharmacies in Qassim region at the central region of Saudi Arabia and reported that only one fifth of the counseling content assessed in the study was found satisfactory and that the quality of medication counseling services provided to patients was poor. A systematic review on the studies addressing community pharmacists' patient-centered care services in Saudi Arabia indicated great shortages in providing high quality services.¹⁶ A cross-sectional study conducted in Riyadh, Saudi Arabia evaluating counseling practices in community pharmacies showed shortcomings in proper dispensing practices and medication counseling at community pharmacies.¹⁷

However, most previous studies were not directly addressing the counseling practices of a particular pharmaceutical care service. It is possible that such studies overlooked some of the available best practices because researchers focused on assessing counseling or medications centered care in general. There might be room for identifying positive findings when assessing a particular service like diabetic care, smoking cessation assistance, and supporting customers regarding their cosmetic products and medical devices. In this regard, there were reports documenting the presence of positive practices. For example, Gillani et al¹⁸ assessed community pharmacist perceptions of healthcare services in Saudi Arabia. Among findings, one third of the respondents claimed they provided clinical services to the community. The study revealed that confidence to practice can be predicted by knowledge to practice, value of practice, and need for practice.¹⁸ A sample of community pharmacists from Riyadh have been surveyed. They perceived counseling patients on OTC, prescription drugs, and other health-related problems as a top priority compared to other activities like dispensing, stocking, and purchasing.¹⁹ According to a study conducted by Alshahrani,²⁰ community pharmacists in Saudi Arabia showed extensive knowledge, were prepared to play a supportive role, and displayed positive attitudes towards the fight against coronavirus disease of 2019 (COVID-19). Regarding counseling, most community pharmacists considered that counseling customers on COVID-19 is an important activity. A survey of community pharmacists from the western

region of Saudi Arabia indicated good responses among pharmacists regarding their professional role in dispensing beauty products and their counseling practice in this area.²¹

To our knowledge, there has been no study conducted in Saudi Arabia addressing pharmacists counseling practice regarding medical devices. However, we conducted a study among a small sample of pharmacy students from Saudi Arabia to explore their preparedness to counsel patients about medical devices.²² Pharmacy students showed moderate knowledge and reported high-to-moderate perceived preparedness to counsel patients about medical devices. Students' perceived ability to use medical devices and perceived ability to counsel were highly correlated.²² Blood glucose monitor, blood pressure monitor, insulin pen, and metered dose inhaler (MDI) were rated highest compared to other devices regarding both use and counseling abilities.²² In the same context we conducted a pilot study among Sudanese pharmacists to assess their readiness to counsel patients about medical devices.²³ Devices commonly available in the market were perceived to be better used by pharmacists. Five devices, namely thermometers, weighing scales, syringes, blood glucose monitors, and blood pressure monitors, were the most-used personally by pharmacists and the pharmacists reported highest confidence to use them properly and highest confidence to counsel patients about them. The study generates a hypothesis that the ability to counsel patients about medical devices is likely a reflection of pharmacists' exposure to such devices, and is likely related to their ability to use such devices.²³

Hence, the present study was conducted to assess medical devices-related counseling practices among community pharmacists in Saudi Arabia using a large nationwide sample.

Methodology

Study Design and Participants

A cross-sectional survey-based study was conducted between August to November 2020 involving community pharmacists from different regions of Saudi Arabia. Convenience sampling was employed as a sampling technique.

Study Setting

The study setting included community pharmacies from different regions of Saudi Arabia. All pharmacies have

a licence from the health authority to provide services to all patients and customers from the broad community population were eligible for inclusion. This includes chain and individual pharmacies and pharmacies affiliated to hospitals and health centers but open outside the institution to provide services to the whole community. In Saudi Arabia, community pharmacies' basic scope of services normally includes dispensing prescribed and over-the-counter medications as well as cosmetic and household products and medical devices. Pharmacists are allowed to provide counseling to the patients and customers as a core part of their services. In-patient and out-patient hospital pharmacies and pharmacies located inside health centers to service only patients attending the institutions were not included.

Ethical Considerations

Taif university research ethics committee approved the study (reference number 41–00193). A brief description of the study and its importance and goals was displayed at the beginning of the survey with a question asking pharmacists to choose “yes” if they were voluntarily willing to participate. Respondents were informed that participation was optional, and that data would be anonymously analyzed and presented. All agreed to participate in the survey. The data was downloaded anonymously from Google Forms in the form of an Excel sheet. Nothing can be used to uncover the identity of the participants.

Data Collection

Respondents completed an online survey using Google forms. The link to the survey was shared with key persons in community pharmacy groups and by distribution among pharmacists using social media like WhatsApp and Facebook groups. To encourage the participation of community pharmacists, reminders were sent frequently.

Sample Size

According to most recently available statistics reported by AlRuthia et al in 2018,²⁴ the number of community pharmacists working in different regions of Saudi Arabia was 8,419. By convention, surveying a sample of 10% of a population would be representative. In the light of such information, the researcher assumed that surveying 850 pharmacists would be representative of the community pharmacists in the whole country (ie, 10%).

The Survey

The original questionnaire included 10 items developed specifically for the purpose of this study based on general reading of literature. The present analysis included only seven, as follows: 1) types of medical devices respondents encountered during practice (12 therapeutic categories); 2) medical devices used personally by the respondents for self-treatment (20 medical devices/responses; no or yes); 3) medical devices representing patients' common inquiry (20 medical devices/each rated on a 5-point Likert scale, with possible scores ranging from 1–5); 4) self-rating of ability to use or operate medical devices (20 medical devices/each rated on a 5-point Likert scale, with possible scores ranging from 1–5); 5) self-rating of confidence to counsel patients about medical devices (20 medical devices/each rated on a 5-point Likert scale, with possible scores ranging from 1–5); 6) reported counseling practice (20 medical devices/each rated on a 5-point Likert scale, with possible scores ranging from 1–5); and 7) medical devices being supplied to patients (20 medical devices/each rated on 5-point Likert scale, with possible scores ranging from 1–5).

Validation of Questionnaire

Five academic staff from different origins, countries, and academic institutions who had excellent experiences in pharmacy practice and healthcare services in addition to a practicing clinician validated the questionnaire items for face and content. Their feedback has been used to edit the questionnaire regarding phrasing and contents until they were satisfied. Furthermore, the questionnaire has been piloted on smaller sample of pharmacists from Sudan and the data has been published elsewhere.²³ Questions measuring ability to use medical devices (20 items, Cronbach's alpha=0.887), confidence to counsel patients about medical devices (20 items, Cronbach's alpha=0.921), medical devices representing patients' common inquiry (20 items, Cronbach's alpha=0.912), reported counseling practice (20 items, Cronbach's alpha=0.937), and supplying devices to the patients (20 items, Cronbach's alpha=0.938) showed high reliability. Slight edits in some wordings were made in the version used in the current study, such as using the description Metered Dose Inhalers (MDIs) instead of inhalers and adding the description “diskus” with “accuhalers”. The questionnaire is provided as [Supplementary material](#).

Statistical Analysis and Data Presentation

Descriptive and inferential analyses were conducted using IBM SPSS version 22.²⁵ For all variables with 5-point Likert scale responses, scores on average ratings were computed for every device (minimum score=0, maximum score=5). This included scores on the following: 1) the device representing patients' common inquiry, 2) pharmacists' ratings on their ability to use the device, 3) pharmacists' ratings on their confidence to counsel patients about the device, 4) pharmacists' ratings on counseling practice regarding the device, and 5) pharmacists' ratings of supplying patients with the device. A final average score was computed for each of the previous five items representing the counseling-related practices on all 20 medical devices (ie, five variables on overall counseling practices scores). For the purpose of this study, self-reported practice of pharmacists was considered excellent when the average score is ≥ 4 , very good when the average score is ≥ 3.5 – <4 , good when the average score is ≥ 3 – <3.5 , average when the average score is ≥ 2 – <3 , poor when the average score is <2 – ≥ 1.5 , and very poor when the average score is <1.5 . A variable was computed from the 20 questions on medical devices use for self-treatment by calculating the sum of the yes responses (theoretically, maximum possible score should be 20 but actually no respondent selected yes for all devices).

Comparisons regarding computed scores between dichotomous demographic and background variables were conducted using Student's *t*-test. One-way analysis of variance (ANOVA) was used to test differences between demographic and background groups having multicategory responses. Correlational analyses were performed using Pearson correlation. In all analyses, results with a *p*-value of <0.05 were considered statistically significant.

Results

Demographic Characteristics

One thousand and six community pharmacists responded to the online survey. The highest category of participants was those aged 25–34 years old (73.6%) (Table 1). Males represented the majority (97.1%). The majority were non-Saudi (92.8%), located in cities (92.5%), and were bachelor's degree holders (84.4%). Slightly more than one fifth of the respondents received clinical training (23.4%) or got a board certification (22%). By geographical region, most respondents were from Makkah region ($n=388$,

Table 1 Demographic and Background Information of Respondents (N=1,006)

Variable	Categories	Frequency (%)
Age	<25 Years	34 (3.4)
	25–34 Years	740 (73.6)
	35–44 Years	208 (20.7)
	45–54 Years	23 (2.3)
	≥ 55 years	1 (0.1)
Gender	Male	977 (97.1)
	Female	29 (2.9)
Nationality	Saudi	72 (7.2)
	Non-Saudi	934 (92.8)
Work location	City	931 (92.5)
	Village	75 (7.5)
Highest qualification	Diploma	21 (2.1)
	Bachelor	849 (84.4)
	Pharm.D.	121 (12.0)
	Master	13 (1.3)
	PhD	2 (0.2)
Years of experience	<2	62 (6.2)
	2–5	215 (21.4)
	6–9	375 (37.3)
	10–13	210 (20.9)
	14–17	101 (10.0)
	18–21	32 (3.2)
	≥ 21	11 (1.1)
Extra qualifications and experiences*	Holds board certification	221 (22.0)
	Received clinical training	235 (23.4)

Notes: *Categories are not mutually exclusive, reported response in each is yes.

38.6%), which included three populous provinces: Makkah, Taif, and Jeddah (Figure 1). This was followed by Riyadh region that included the capital city and other provinces ($n=228$, 22.7%). The third highest category of respondents were from Asir ($n=106$, 10.5%) followed by Al Madinah region ($n=77$, 7.7%) as the fourth highest category of respondents. Few of the respondents were from the other regions of Saudi Arabia.

Awareness About Medical Devices

Awareness about medical devices arises from being exposed to the devices during practice or early training (Figure 2) or because of personal use of a device for self-treatment (Figure 3). From Figure 2, the types of medical devices (by therapeutic categories) the respondents

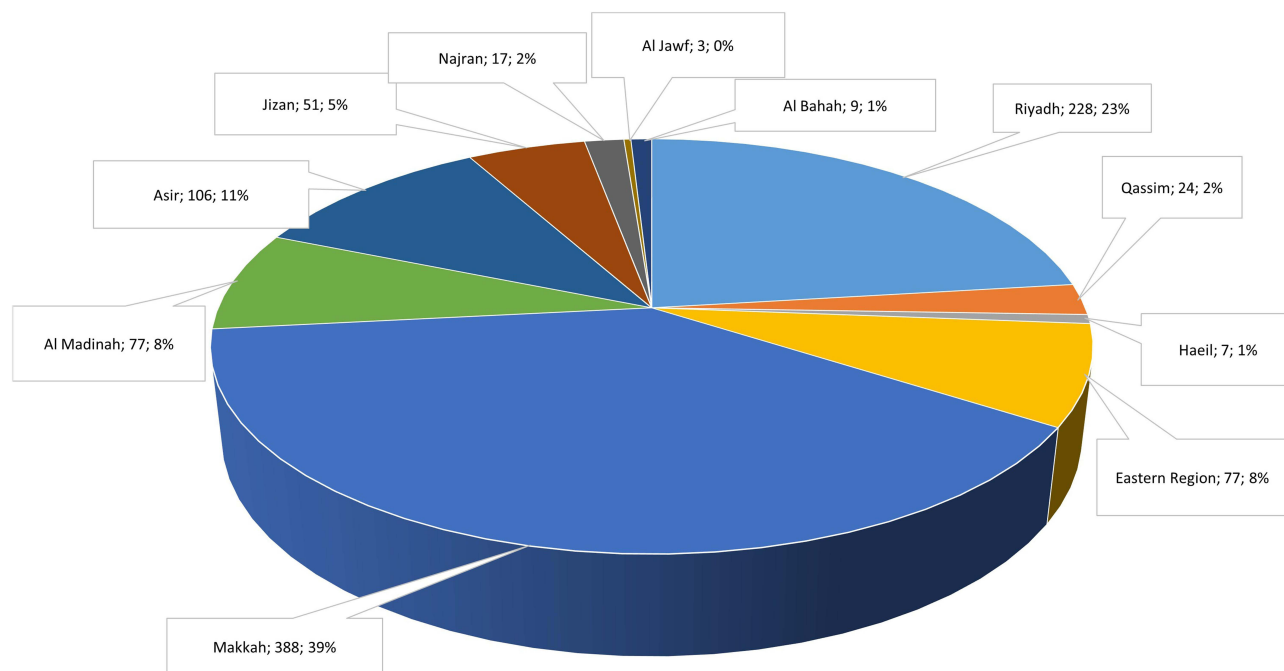


Figure 1 Distribution of community pharmacists by region (N=1,006).

encountered were mostly pulmonary (89.6%) followed by cardiology (71.2%). **Figure 3** shows medical devices used by respondents for self-treatment. Thermometers (57.3%), weighing scales (54.2%), first aid equipment (46.2%), blood pressure monitors (39.6%), and blood glucose monitors (34.3%) were the devices most used personally by pharmacists. Implanted devices (12.9%) were the least used devices.

Medical Devices Represent Patients' Common Inquiry

The top five devices which represented patients' common inquiry (**Table 2**, the first four devices got a rating score ≥ 4) were blood glucose monitors (score=4.28), blood pressure monitors (4.23), thermometers (4.14), weighing scales (4.04), and metered dose inhalers (MDIs, 3.97). Implanted devices (2.68), stethoscope (2.67), and testing kits (2.66) represented devices with the least patients' inquiry. The overall average score of this counseling-related practice (ie, being a patient's common inquiry) on the five-point Likert scale was acceptable (score=3.46).

Pharmacists' Self-Rating of Ability to Use/Operate Medical Devices

The top seven devices rated highest (all got a rating score ≥ 4) by pharmacists in terms of ability to be used

(**Table 2**) were blood glucose monitors (score=4.35), blood pressure monitors (4.33), thermometers (4.29), weighing scales (4.22), nebulizers (4.16), metered dose inhalers (MDIs, 4.13), and insulin pens (4.07). Implanted devices (2.64), respirometers (2.92), and testing kits (2.98) represented the devices that pharmacists were least able to use/operate. The overall average score of this counseling-related practice (ie, ability to use/operate medical devices) on the five-point Likert scale was excellent (score=3.77).

Pharmacists' Self-Rating of Confidence to Counsel Patients About Medical Devices

The top seven devices rated highest (all got a rating score ≥ 4) by pharmacists in terms of confidence to counsel about (**Table 2**) were blood glucose monitors (score=4.26), blood pressure monitors (4.24), thermometers (4.22), weighing scales (4.15), nebulizers (4.05), insulin pens (4.01), and metered dose inhalers (MDIs, 4.00). Implanted devices (score=2.75), respirometers (3.03), and testing kits (3.09) represented the devices that pharmacists were least confidence to counsel about. The overall average score of this counseling-related practice (ie, confidence to counsel patients about medical devices) on the five-point Likert scale was excellent (score=3.75).

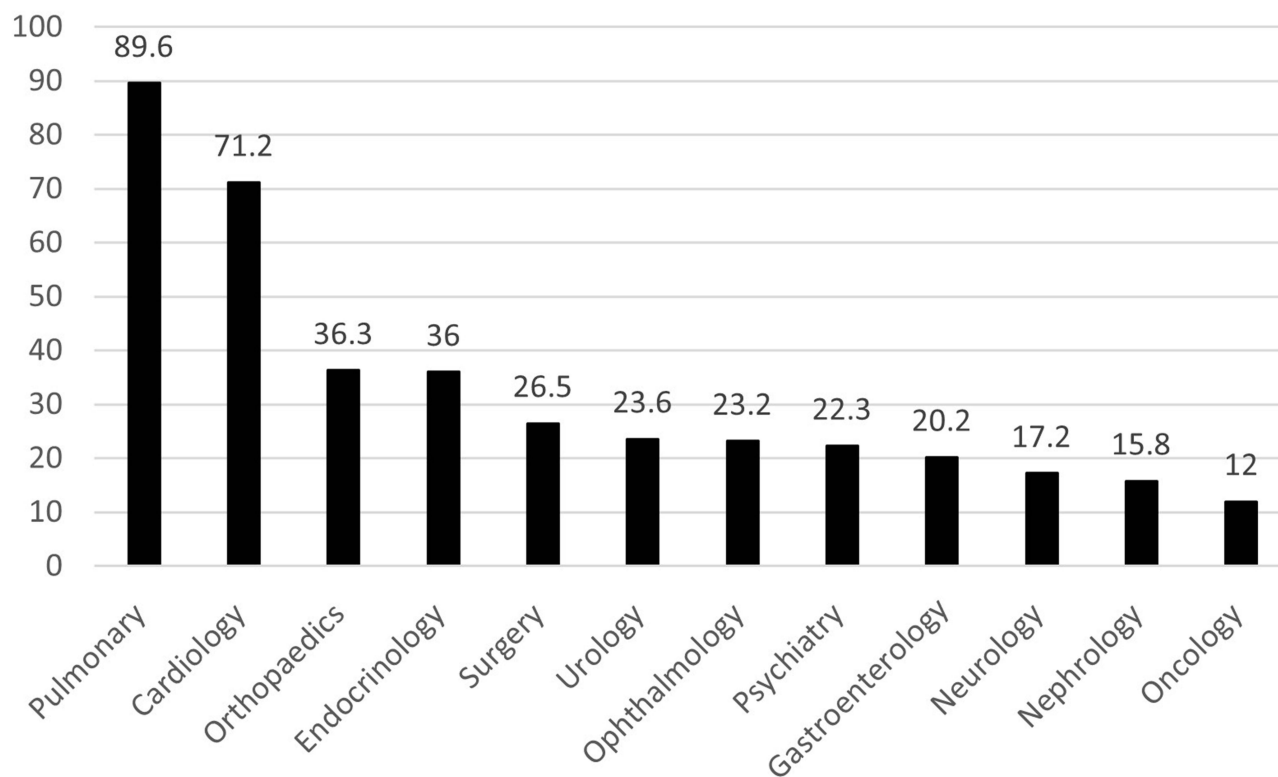


Figure 2 Types of medical devices (by therapeutic categories) that pharmacists (N=1,006) come across during practice (y-axis represents percentage).

Reported Counseling Practice Related to Medical Devices

The top five devices rated highest by pharmacists in terms of counseling practice (Table 2, the first four devices got a rating score ≥ 4) were blood glucose monitors (score=4.17), blood pressure monitors (4.15), thermometers (4.10), weighing scales (4.02), and nebulizers (3.92). Implanted devices (score=2.79), respirometers (3.00), testing kits (3.06), and stethoscope (3.07) represented the devices which got the least counseling. The overall average score of this counseling-related practice (ie, reported counseling about medical devices) on the five-point Likert scale was excellent (score=3.63).

Pharmacists' Supply of Medical Devices

The top five devices rated highest in terms of being supplied by pharmacists to the patients (Table 2, none got a rating score ≥ 4) were blood glucose monitors (score=3.68), blood pressure monitors (3.66), thermometers (3.65), weighing scales (3.62), and nebulizers (3.35). Implanted devices (score=2.59), respirometers (2.73), stethoscope (2.76), and testing kits (2.77) represented the devices least supplied to patients. The overall

average score of this counseling-related practice (ie, supplying patients with medical devices) on the five-point Likert scale was acceptable (score=3.20).

Comparisons Between Groups

Comparisons by demographic categories were conducted concerning the mean scores (on the five-point Likert scale) for each one of the five counseling-related practices (ie, “devices representing patients’ common inquiry”, “pharmacists’ self-rating of ability to use/operate the devices”, “pharmacists’ self-rating of confidence to counsel about the devices”, “reported counseling practice”, and “devices being supplied to patients”), besides the variable “being used personally by pharmacists for self-treatment”.

Table 3 shows variability in the medical devices counseling-related practices by gender and years of experience. Males’ rating of their ability to operate medical devices was significantly higher than females (overall average score of 3.8 versus 3.5, Student’s *t*-test *p*-value=0.033). As years of experience increased there were slight but significant increases in the overall scores on ability to operate medical devices and confidence to counsel patients about the devices (ANOVA *p*-values=0.002 and 0.032, respectively). Table 4 shows variability in the medical

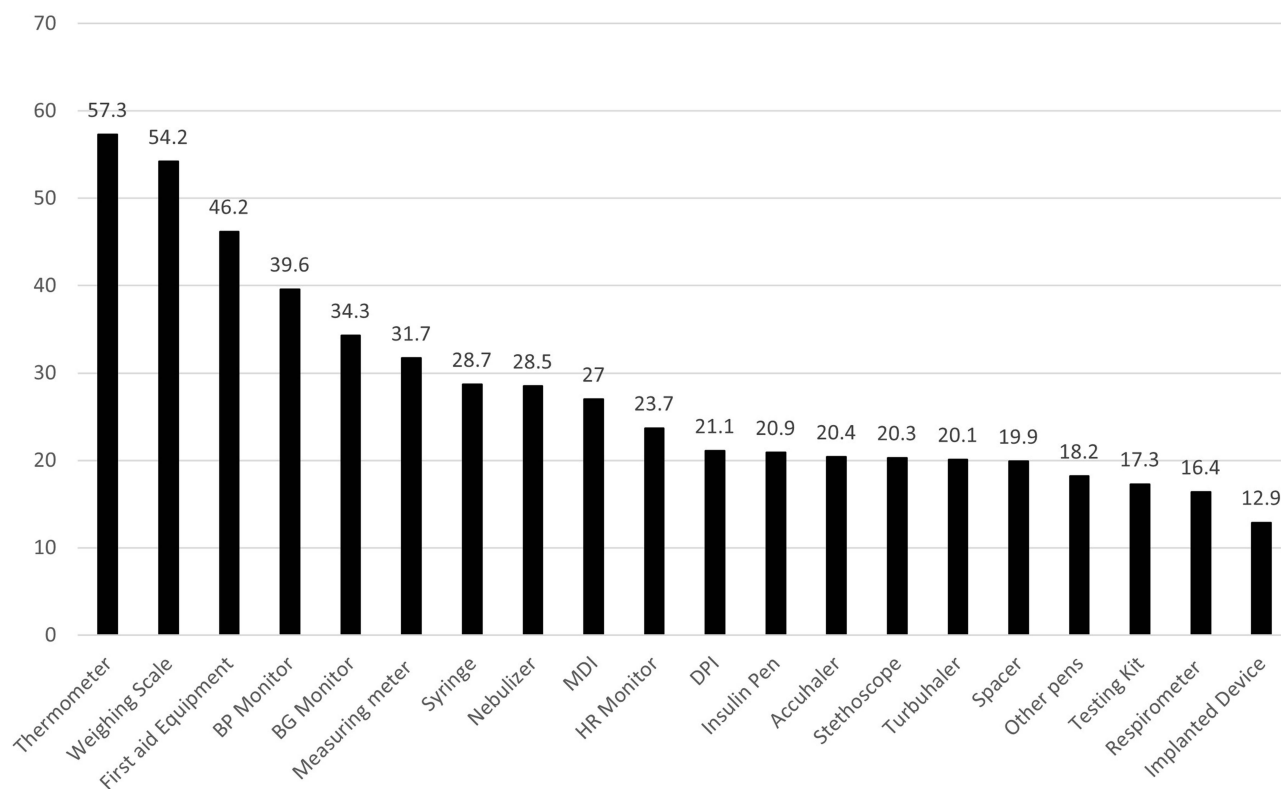


Figure 3 Medical devices used by pharmacists (N=1,006) for self-treatment (y-axis represents percentage).

devices counseling-related practices by highest qualification, board certification, and clinical training. Those who got a board certification used devices for self-treatment significantly more than their counterparts (on average 6.9 devices versus 5.2, Student's *t*-test *p*-value=0.003). Those who received clinical training reported higher rates of ability to use/operate devices, confidence to counsel patients on devices and reported counseling practice than those who did not receive clinical training (Student's *t*-test *p*-values=0.011, 0.001, and 0.044, respectively). By age group there were no significant differences in the overall scores of all counseling-related practices.

Correlational Analyses

Table 5 shows the correlations between medical devices counseling-related practices. "Reported ability to use medical devices", "confidence to counsel patients about medical devices", and "reported counseling about medical devices" were all highly and significantly correlated with each other. "Supplying patients with medical devices" correlated slightly but significantly with "using devices personally for self-treatment" and moderately and significantly with all other counseling practices. "Devices representing patients' common inquiry" correlated moderately

and significantly with all counseling practices, except "using devices personally for self-treatment", where the correlation was low.

Discussion

The influence of community pharmacists as health and pharmaceutical care providers is great on their societies worldwide due to their high accessibility and availability.²⁶⁻³¹ Serving community needs concerning medical devices is an essential emerging role expected to be fulfilled efficiently by community pharmacists everywhere.^{32,33} This is specifically important due to the increasing concerns about bioethical and healthcare concepts like autonomy, patients' rights, and self-care, which give patients and consumers more rights and roles in making decisions and caring for their own health.³⁴⁻³⁸ In some countries, patients and customers go to community pharmacies and request a variety of pharmaceutical products, cosmetics, and medical devices without prescriptions.³⁹⁻⁴⁴ Saudi Arabia is not different in this regard.⁴⁵ This requires a control from community pharmacists to reduce harms associated with misuse and irrational use and to ensure achievement of intended outcomes. This in turns necessitates pharmacists' preparedness with

Table 2 Medical Devices Counseling-Related Practices Concerning the 20 Devices Covered by the Study

Medical Device	Representing Patients' Common Inquiry	Self-Rating of Ability to Use	Self-Rating of Confidence to Counsel	Actual Counseling Practice	Being Supplied to Patients
	Mean Score (SD)	Mean Score (SD)	Mean Score (SD)	Mean Score (SD)	Mean Score (SD)
Metered Dose Inhalers	3.97 (1.00)	4.13 (0.90)	4.00 (0.95)	3.87 (0.97)	3.27 (1.23)
Spacers	3.46 (1.05)	3.91 (1.04)	3.87 (1.03)	3.75 (1.06)	3.24 (1.23)
Dry powder inhalers	3.36 (1.09)	3.84 (1.07)	3.82 (1.05)	3.70 (1.08)	3.17 (1.26)
Nebulizers	3.82 (1.04)	4.16 (0.93)	4.05 (0.98)	3.92 (1.01)	3.35 (1.22)
Accuhalers/ Diskus	3.44 (1.07)	3.87 (1.04)	3.84 (1.05)	3.72 (1.08)	3.20 (1.26)
Turbuhalers	3.42 (1.08)	3.84 (1.07)	3.83 (1.04)	3.73 (1.08)	3.19 (1.24)
Blood pressure monitors	4.23 (0.91)	4.33 (0.90)	4.24 (0.94)	4.15 (0.95)	3.66 (1.20)
Heart rate monitors	3.35 (1.15)	3.53 (1.16)	3.54 (1.17)	3.46 (1.20)	3.01 (1.31)
Blood glucose monitors	4.28 (0.94)	4.35 (0.90)	4.26 (0.95)	4.17 (0.95)	3.68 (1.23)
Insulin pens	3.84 (1.10)	4.07 (1.00)	4.01 (1.00)	3.85 (1.05)	3.27 (1.32)
Pens other than insulin	3.38 (1.15)	3.75 (1.14)	3.71 (1.12)	3.62 (1.12)	3.09 (1.32)
Implanted devices	2.68 (1.26)	2.64 (1.29)	2.75 (1.31)	2.79 (1.33)	2.59 (1.32)
Weighing scales	4.04 (1.02)	4.22 (0.94)	4.15 (0.97)	4.02 (1.02)	3.62 (1.22)
Syringes	3.36 (1.19)	3.81 (1.15)	3.82 (1.11)	3.66 (1.13)	3.19 (1.30)
Stethoscope	2.67 (1.17)	3.28 (1.26)	3.28 (1.28)	3.07 (1.30)	2.76 (1.32)
Thermometers	4.14 (0.99)	4.29 (0.92)	4.22 (0.96)	4.10 (0.99)	3.65 (1.22)
Testing kits	2.66 (1.26)	2.98 (1.28)	3.09 (1.25)	3.06 (1.30)	2.77 (1.31)
First aid equipment	3.37 (1.13)	3.88 (1.08)	3.83 (1.09)	3.65 (1.13)	3.34 (1.23)
Measuring meters	2.83 (1.21)	3.69 (1.19)	3.72 (1.16)	3.43 (1.24)	3.03 (1.31)
Respirometers	2.85 (1.23)	2.92 (1.31)	3.03 (1.30)	3.00 (1.33)	2.73 (1.33)
Average score	3.46 (0.72)	3.77 (0.74)	3.75 (0.78)	3.63 (0.83)	3.20 (1.01)

required knowledge and skills and their willingness to counsel patients about such products.

The present study revealed good to very good medical devices-related counseling practices, as the average scores of most devices-related counseling practices assessed were above 3.5. The study covered five medical devices-related counseling practices. There were high-to-weak, but always significant correlations between such practices. The reported ability to use medical devices, confidence to counsel about devices, and reported counseling were all highly and significantly correlated with each other. For all counseling practices, the four top rated devices were the

same, which were blood glucose monitors, blood pressure monitors, thermometers, and weighing scales. Among other top-rated devices in certain counseling practices were nebulizers, metered dose inhalers, and insulin pens. The consistent pattern of highly scored devices across different counseling practices (ie, reported use for self-treatment, ability to use, confidence to counsel, counseling, and supplying devices) and the high correlations between such counseling practices indicates the coherence and consistency of the findings of this study.

Improving counseling practice of community pharmacists requires the presence of enabling factors and removal

Table 3 Variability in the Medical Devices Counseling-Related Practices by Gender and Years of Experience

Devices-Related Counseling Practice	Gender			Experience							
	M (n=977)	F (n=29)	Test Statistic (p-value) ^a	<2 years (n=62)	2-5 years (n=215)	6-9 years (n=375)	10-13 years (n=210)	14-17 years (n=101)	18-21 years (n=32)	≥ 21 years (n=11)	Test Statistic (p-value) ^b
Used personally by respondent [Mean score (SD)]	5.6 (6.4)	5.1 (5.5)	0.514 (0.611)	5.1 (6.2)	5.1 (6.7)	5.2 (6.5)	6.4 (6.2)	6.3 (5.6)	6.3 (6.7)	8.0 (7.6)	1.600 (0.144)
Representing patients' common inquiry [Mean score (SD)]	3.4 (0.7)	3.5 (0.8)	-0.714 (0.475)	3.4 (0.8)	3.5 (0.7)	3.4 (0.7)	3.5 (0.7)	3.4 (0.6)	3.4 (0.6)	3.6 (0.7)	1.000 (0.424)
Self-rating of ability to use [Mean score (SD)]	3.8 (0.7)	3.5 (0.8)	2.137 (0.033)*	3.4 (0.8)	3.7 (0.7)	3.8 (0.7)	3.7 (0.7)	3.8 (0.7)	3.8 (0.6)	4.1 (0.5)	3.561 (0.002)**
Self-rating of confidence to counsel [Mean score (SD)]	3.8 (0.8)	3.6 (0.6)	1.297 (0.195)	3.5 (0.9)	3.6 (0.8)	3.8 (0.8)	3.8 (0.8)	3.8 (0.7)	3.7 (0.9)	3.9 (0.7)	2.315 (0.032)*
Actual counseling practice [Mean score (SD)]	3.6 (0.8)	3.4 (0.9)	1.432 (0.152)	3.4 (1.0)	3.6 (0.8)	3.7 (0.8)	3.6 (0.8)	3.7 (0.7)	3.6 (0.9)	3.8 (0.8)	1.051 (0.391)
Being supplied to patients [Mean score (SD)]	3.2 (1.0)	3.2 (1.0)	0.331 (0.741)	3.1 (1.1)	3.2 (0.9)	3.1 (1.0)	3.2 (1.0)	3.2 (0.9)	3.2 (1.2)	3.0 (1.2)	0.353 (0.908)

Notes: ^aStudent's t-test, ^bOne way ANOVA, *Statistically significant at p-value<0.05, **Statistically significant at p-value<0.01.

of obstacles and barriers encountered during practice, as had been established from previous research. The lack of knowledge and time, absence of pharmacy information database, deficiency of continued professional development training, and professional and cultural issues were barriers to providing counseling in Saudi Arabia.¹⁶ Nationalization of practice and the presence of incentives and rewards for providing patient-centered care have been identified as motivators of positive practice change in community pharmacy in Saudi Arabia.⁴⁶ The authors highlighted the importance of effective collaboration between community pharmacy owners or chief operating

officers, professional pharmacy organizations, and pharmacy colleges for the successful implementation of the change process in community pharmacy practice in the KSA.⁴⁶

The presence of a small proportion of female pharmacists in this sample reflects the actual pattern of practice in Saudi Arabia. AlRuthia et al²⁴ documented the status of the licensed pharmacy workforce in Saudi Arabia and reported that females represented only 14.84% of pharmacists working in different settings of practice. Most of those were working in hospitals and academia. Almaghaslah et al⁴⁷ also documented the pharmacy

Table 4 Variability in the Medical Devices Counseling-Related Practices by Highest Qualification, Board Certification, and Clinical Training

Devices-Related Counseling Practice	Qualification							Board Certification			Clinical Training		
	Diploma (n=21)	Bachelor (n=849)	PharmD (n=121)	Master (n=13)	PhD (n=2)	Test Statistic (p-value) ^b	No (n=785)	Yes (n=221)	Test Statistics (p-value) ^a	No n=771	Yes n=235	Test Statistic (P value) ^a	
Used personally by respondent [Mean score (SD)]	4.6 (6.2)	5.4 (6.2)	6.6 (7.2)	8.2 (8.0)	12 (8.5)	2.053 (0.085)	5.2 (6.2)	6.8 (7.1)	2.983 (0.003)**	5.4 (6.2)	6.3 (7.0)	1.891 (0.059)	
Representing patients' common inquiry [Mean score (SD)]	3.2 (0.7)	3.4 (0.7)	3.5 (0.7)	3.7 (0.5)	3.9 (1.0)	1.354 (0.248)	3.5 (0.7)	3.4 (0.8)	-0.363 (0.717)	3.4 (0.7)	3.5 (0.7)	1.296 (0.195)	
Self-rating of ability to use [Mean score (SD)]	3.5 (0.7)	3.8 (0.7)	3.7 (0.8)	4.0 (0.7)	4.7 (0.5)	2.040 (0.087)	3.8 (0.7)	3.8 (0.8)	0.992 (0.321)	3.7 (0.7)	3.9 (0.8)	2.560 (0.011)*	
Self-rating of confidence to counsel [Mean score (SD)]	3.4 (0.8)	3.8 (0.8)	3.7 (0.8)	3.9 (0.8)	4.6 (0.3)	2.059 (0.084)	3.7 (0.8)	3.8 (0.8)	1.870 (0.062)	3.7 (0.8)	3.9 (0.8)	3.261 (0.001)**	
Actual counseling practice [Mean score (SD)]	3.3 (0.8)	3.6 (0.8)	3.7 (0.9)	3.7 (0.8)	4.7 (0.4)	2.282 (0.059)	3.6 (0.8)	3.7 (0.8)	1.670 (0.095)	3.6 (0.8)	3.7 (0.8)	2.015 (0.044) *	
Being supplied to patients [Mean score (SD)]	2.9 (0.9)	3.2 (1.0)	3.2 (1.1)	3.1 (0.7)	4.5 (0.7)	1.415 (0.227)	3.2 (0.9)	3.3 (1.1)	1.733 (0.083)	3.2 (0.9)	3.3 (1.1)	1.443 (0.149)	

Notes: ^aStudent's t-test, ^bOne-way ANOVA, *Statistically significant at p-value<0.05, **Statistically significant at p-value<0.01.

Table 5 Correlations Between Medical Devices Counseling-Related Practices

	Used Personally by Respondent [ρ (p-value)]	Representing Patients' Common Inquiry [ρ (p-value)]	Self-Rating of Ability to Use [ρ (p-value)]	Self-Rating of Confidence to Counsel [ρ (p-value)]	Actual Counseling Practice [ρ (p-value)]	Being Supplied to Patients [ρ (p-value)]
Used personally by respondent [ρ (p-value)]		0.121*	NS	NS	NS	0.129*
Representing patients' common inquiry [ρ (p-value)]	0.121*		0.492*	0.408*	0.469*	0.314*
Self-rating of ability to use [ρ (p-value)]	NS	0.492*		0.794*	0.706*	0.435*
Self-rating of confidence to counsel [ρ (p-value)]	NS	0.408*	0.794*		0.759*	0.461*
Actual counseling practice [ρ (p-value)]	NS	0.469*	0.706*	0.759*		0.530*
Being supplied to patients [ρ (p-value)]	0.129*	0.314*	0.435*	0.461*	0.530*	

Notes: ρ : Pearson correlation coefficient, *Significant at p-value<0.001.

Abbreviation: NS, not significant.

workforce in Saudi Arabia and reported that community pharmacists represent 74.5% of total pharmacists in the private sector and females account for 0.3% only.

The strengths of the present study were the large sample size and the relative representation of different geographical regions of Saudi Arabia, making it a nationwide survey. A limitation of the study was the absence of a sampling frame (a list of all pharmacists in Saudi Arabia with their emails or contact information) which prevented researchers from taking a probability sample which in turns prevented the stratification of the sample by geographical region. Thus, a convenient sampling technique was used as the only feasible sampling technique for this huge number of participants. Another limitation of the study was its relay on self-reporting of practice rather than assessing actual practice. This might be associated with the possibility of some reporting bias which cannot be totally ruled out. However, nothing throws doubt on the validity of findings of this study given that most pieces of

findings were consistent. As baseline data, the findings of this study would represent an excellent starting point and a base for future more rigorous study designs in this overlooked area of practice. Another limitation was the nature of the online survey. Surveying this huge number of participants was difficult to achieve face-to-face. In addition, the time of data collection was during the mid-time of the COVID-19 outbreak in Saudi Arabia, which was associated with complete lockdown. Hence, it was impossible to survey pharmacists face-to-face. However, an advantage of the online survey which has been gained in this study is the possibility of surveying a large sample of respondents. The participation of pharmacists from different regions of Saudi Arabia made the study representative of pharmacists working all over the Kingdom.

Conclusion

The present study revealed good-to-very good self-reported medical devices-related counseling practices. There is

a need for more rigorous future research to evaluate pharmacists' actual practice in this area. Pharmacy educators and CPD programs should pay attention to updating pharmacists' knowledge and skills and improve their contribution to medical devices supportive services.

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Disclosure

The author reports no conflicts of interest in this work.

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