

# Knowledge and perceptions of patients towards generic and local medications: The lebanese version

Amani Mehtar<sup>1</sup>, Azza Gazy<sup>2</sup>, Marwa Al Jamal<sup>2</sup>, May Saab<sup>2</sup>

<sup>1</sup> Department of Pharmacology and Therapeutics, Faculty of Pharmacy, Beirut Arab University, Beirut, Lebanon

<sup>2</sup> Department of Pharmaceutical Technology, Faculty of Pharmacy, Beirut Arab University, Beirut, Lebanon

Corresponding author: May Saab (saabk.may79@bau.edu.lb)

Received 11 December 2022 ♦ Accepted 2 February 2023 ♦ Published 9 February 2023

**Citation:** Mehtar A, Gazy A, Al Jamal M, Saab M (2023) Knowledge and perceptions of patients towards generic and local medications: The lebanese version. *Pharmacia* 70(1): 121–127. <https://doi.org/10.3897/pharmacia.70.e98699>

## Abstract

Lebanon is one of the Mediterranean countries that are devastated by economic crisis. Knowing that generic medications are less costly when compared to brands, it is crucial to assess patients' understanding and views regarding these medications.

A 25-item self-administered anonymous questionnaire was distributed to a total of 421 participants. The questionnaire appraised participants' knowledge and perceptions about generics versus brand medications, in addition to their perceptions and attitudes towards generic substitution. Most respondents agreed that generics are not inferior to their brand equivalents in terms of quality, efficacy and safety (66%, 68.9%, and 66.7%, respectively). On the other hand, 79.4% (n=334) accepted generic substitution for minor ailment medications, whereas, only 56.1% (n=236) accepted this substitution for their chronic medications. As a conclusion, the uncertainty about the use of generic medications, particularly those treating chronic illness is still an obstacle to overcome.

## Keywords

generic, imported, knowledge, local, medications, perceptions, substitution

## Introduction

The increase in healthcare costs has garnered public attention for over a decade (Dong et al. 2021). Most of healthcare costs are expended on medicines. Hence, out of pocket expenditures on medications would aggravate financial burden. A primary key to mitigate such economic burden is to provide cost effective treatments via generic substitutions (Chaudhary et al. 2021). As defined by the World Health Organization (WHO), "generic medications are pharmaceutical products commonly intended to be interchangeable with brand medications". They are produced without the need of an innovative company license and are put on the market after the expiry of the patency or exclusive rights

of their relevant brand products (Thakkar and Billa 2013; Almohammed et al. 2020) Generic medication companies are not required to replicate innovation, nor pre-clinical and clinical trials. The deliberate outcome of this law is to ensure that generic pharmaceuticals would be available at much lower cost than the comparable innovator products with equivalent pharmaceutical efficacy (Belay 2017).

The use of generic medications is increasing globally (Sharif et al. 2016; Huang et al. 2022). For instance, in 2005, 50% of the dispensed prescription drugs in USA were generic medications. Nevertheless, the dispense of these medications has increased gradually throughout the years, reaching 89% in 2021 (Mikulic 2022). Generic medications are produced under similar manufacturing standards as

their brand-name counterparts. They must have the same active ingredient, strength, route of administration, quality, purity, effectiveness and safety. Yet, some features can be different, such as excipients, color, appearance and product packaging (Saleh et al. 2017; He et al. 2022).

Generics are normally 20–80 percent less costly than their corresponding brands. Thus, initiatives encouraging their use are crucial. Therefore, the concept of generic substitution (GS) is widely endorsed by health authorities in many countries around the world, as the latter are facing a high economic strain imposed by rising pharmaceutical prices (Belay 2017; Saleh et al. 2017).

Generic medications account for 83% of all prescriptions in the United Kingdom and for over 70% in the United States (Straka et al. 2015). Additionally, according to a cost minimization analysis in the private sector of 17 developing nations, switching from 17 originator brands to their least expensive generic versions may save an average of 60% of costs (Mansilla et al. 2017). From here rises the importance of awareness to generic medications, and more specifically locally produced ones, for reducing overheads and consequently to attain better adherence.

Previous studies have revealed patients' misconception and insufficient awareness about generic medications. When compared to their corresponding brand, they consider these medications as less effective, of poorer quality and unsuitable for the treatment of major diseases. Consequently, some patients are always seeking for brand medications and refuse alternatives. On the other hand, patients with low income and those with no medical insurance coverage are less likely to adhere to their prescribed brand medications. Therefore, it is very important to highlight the availability of generic medications with affordable cost (Sharif et al. 2016).

Despite the fact that locally manufactured medications are 15–40% less costly when compared to their imported generic counterparts (Gemayel 2022), these medications account for only 19% of the total pharmaceutical products available in the Lebanese market, where 12% of which are those produced under license from foreign companies (Lewis 2020). These local pharmaceutical products cover only 7% of market demand, which would be one of the contributing factors for reliance of Lebanese residents on imported medications to meet their needs (El Jamal et al. 2020). The major challenges behind the weak pharmaceutical production in Lebanon, are high manufacturing expenses and poor regulatory structure. Consequently, Lebanon is the leading market for imported pharmaceutical medications in the Levant region, with imports making up to 81% of the total pharmaceutical products available in the market (Lewis 2020).

In order to promote generic drug substitution in Lebanon, a unified health prescription (UHP) was released and adopted by the Lebanese physicians in 2015 (Lebanese ministry of Public Health 2015; Saleh et al. 2017). The UHP permits the physicians to mark a check box on the form with "NS", signifying that dispensing a brand product is vital and generic substitution is not allowed. On the other hand, the physician may leave the check box empty,

hence, informing the pharmacist that the prescribed medication can be substituted with a generic one, in an attempt to reduce medication cost (Saleh et al. 2017). However, the overuse of the "NS" drug category on the prescription forms, and the unclear guidance and resistance of physicians to support generic medications have hindered the effective implementation of this policy (Dimassi et al. 2020).

Lebanon is recently facing an economic crisis, along with a massive hyperinflation and drug subsidies to be lifted soon. Consequently, citizens are stocking up on their essential medications which led to shortage in many drugs, particularly those treating chronic diseases. Hence, patients' awareness towards available generic medications being equally effective alternatives to their brand counterparts is of prime importance. The dearth of studies in Lebanon concerning the understanding, acceptance and use of generic medications was the main factor that triggered this research. Patients' views and conviction in generic substitution and more precisely in locally manufactured medications are important, now more than ever, as the latter could play a significant role in improving the ongoing economic status. Moreover, this is the first research that quantitatively measured Lebanese patients' awareness, expectations, and behaviors toward locally manufactured medications.

## Methodology

### Research design

This was a cross-sectional observational study, where a questionnaire was used to collect data from Lebanese participants. Due to COVID-19 restrictions, the questionnaire was distributed to Lebanese citizens through a link created via Google forms and data was collected from January 2021 till April 2021. The Participants' confidentiality and autonomy was respected, and by filling the questionnaire, the participants gave their informed consent.

### Sample size

Sample size was calculated using 'Raosoft' sample size calculator. The sample size was calculated based on 95% confidence interval and an absolute precision of 5%. Thus, to achieve a representative sample, the calculated sample size was 385. A total of 421 respondents participated in the survey, which exceeded the minimum requirement.

### Questionnaire design

The questionnaire was extracted from earlier studies conducted by El-Dahiyat and Kayyali, and Sharif et al. (El-Dahiyat and Kayyali 2013; Sharif et al. 2016) with some modifications to fit with the Lebanese community. It contained 25 questions, prepared in both English and Arabic languages. It consisted of three sections. The first section described the demographic characteristics of the participants. The second one examined their knowledge about generic and brand

medications, where questions were close-ended (answered by yes, no, I don't know). The third section of the questionnaire evaluated the perceptions and attitudes of participants towards generic substitution, their preference between imported and locally produced medications, and their cost. Answers of the final section were based on Likert scale (strongly disagree, disagree, neutral, agree and strongly agree).

## Statistical analysis

All the collected data were entered into Statistical Package for the Social Sciences (SPSS version 17.0). The fraction of each group of respondents who answered on knowledge-based questions as well as those who agreed/strongly agreed, disagreed/strongly disagreed or were neutral in their answers on each statement was calculated using descriptive analysis. Chi square test was used to compute any significant difference between the participants' responses to particular statements in the questionnaire with respect to their demographic characteristics with a significance relevant to a p value <0.05.

## Results

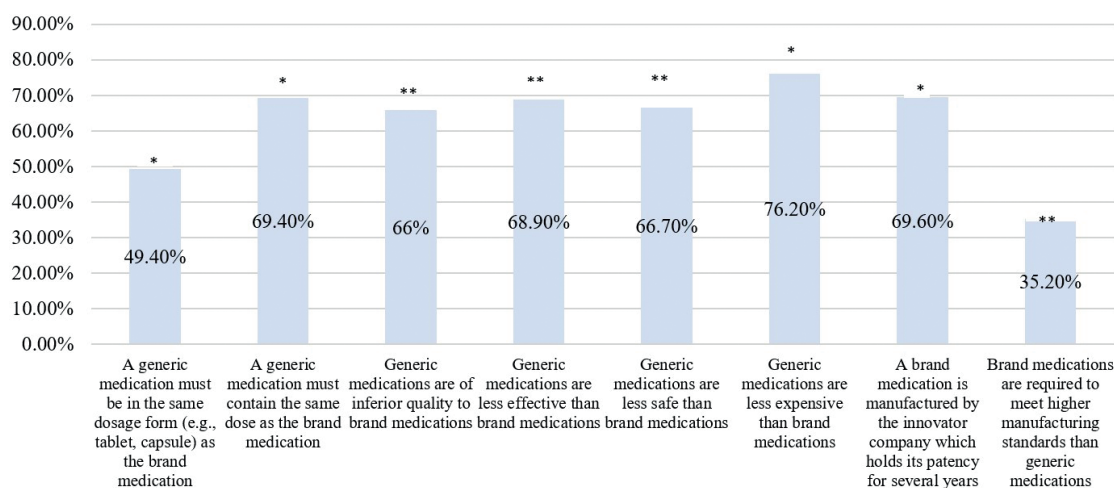
A total of 421 individuals participated in this survey, where participants revealed different demographic characteristics (Table 1). The number of female respondents (254, 60.3%) was higher than that of males (167, 39.7%) and more than half of participants were young (18–29 years). Two-third of the participants are holders of a university degree (277, 65.8%) and from a non-medical background (274, 65.1%). The majority have private insurance or NSSF (342, 81.2%) and do not suffer from any chronic medical condition (319, 75.8%). More than 60% of respondents are employed (263) and more than one third of them have a monthly income of 1–3 million LBP (157, 37.3%) and live in Beirut (172, 40.9%).

The knowledge of respondents about brand and generic medications was investigated (Fig. 1). The similarity in dosage form between brands and generics and

**Table 1.** Demographic data of participants.

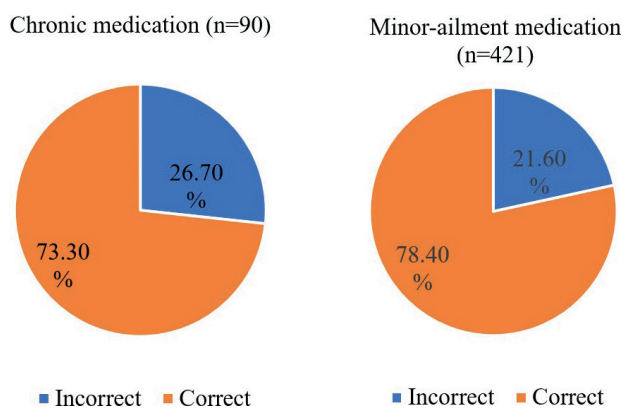
Criteria	n=421, (%)
<b>Gender</b>	
Male	167 (39.7%)
Female	254 (60.3%)
<b>Age</b>	
18–29	237 (56.4%)
30–44	109 (25.6%)
45–59	64 (15.4%)
>60	11 (2.6%)
<b>Educational level</b>	
Uneducated	3 (0.7%)
Middle school	2 (0.5%)
High school	23 (5.5%)
University	277 (65.8%)
Master/ Ph.D.	116 (27.6%)
<b>Educational background</b>	
Medical	147 (34.9%)
Non-medical	274 (65.1%)
<b>Private insurance/ NSSF</b>	
Yes	342 (81.2%)
No	79 (18.8%)
<b>Chronic medical conditions</b>	
No diseases	319 (75.8%)
Cardiovascular	24 (5.7%)
Endocrine	15 (3.6%)
Respiratory	18 (4.3%)
Others	45 (10.7%)
<b>Employment status</b>	
Student	85 (20.2%)
Employed	263 (62.5%)
Un-employed	60 (14.3%)
Retired	13 (3.1%)
<b>Household monthly income in LBP</b>	
<1 million	29 (6.9%)
1–3 millions	157 (37.3%)
3–6 millions	105 (24.9%)
6–9 millions	60 (14.3%)
>9 millions	70 (16.6%)
<b>Area of living</b>	
Beirut	172 (40.9%)
Beqaa	47 (11.2%)
Mount Lebanon	99 (23.5%)
North	60 (14%)
South	44 (10.5%)

the requirements of brands to meet higher manufacturing standards were the least statements answered correctly by the majority (49.4% and 35.2% respectively).



**Figure 1.** Knowledge of participants about generic and brand medications (\*correctly answered by yes, \*\*correctly answered by no).

Most of the participants answered correctly regarding the generic drug dose (69.4%), quality (66%), efficacy (68.9%), safety (66.7%), cost (76.2%) and patency of brand medications (69.6%). Moreover, the majority of patients who take chronic medications (73.3%) and/or minor-ailment medications (78.4%) have been able to appropriately classify them as brands or generics (Fig. 2).



**Figure 2.** Ability of patients to classify their own medications as brands or generics.

The correlation between demographic data and knowledge score was tested (Table 2). There was no statistical significance among the knowledge score of males and females. Likewise, the educational level had no impact on the knowledge of the participants about brand and generic medications. On the other hand, there was a significant correlation between age, and knowledge score ( $p < 0.01$ ), and between the latter and educational background ( $p < 0.001$ ).

**Table 2.** Correlation between demographic data and knowledge score about generic and brand medications.

Demographics	Mean score* $\pm$ SD	Significance	P value
<b>Gender</b>			
Male	4.89 $\pm$ 2.09	-	0.35
Female	5.09 $\pm$ 2.22		
<b>Age</b>			
18-29	5.23 $\pm$ 2.11	-	
30-44	4.38 $\pm$ 2.25	0.004*	0.005
45-59	5.15 $\pm$ 2.00	0.993	
>60	5.63 $\pm$ 2.50	0.930	
<b>Educational level</b>			
Uneducated	4.66 $\pm$ 3.06	-	
Middle school	3.50 $\pm$ 2.94	0.977	0.745
High school	4.60 $\pm$ 1.73	1.000	
University	5.05 $\pm$ 2.18	0.998	
Master/ Ph.D.	5.03 $\pm$ 2.18	0.998	
<b>Educational background</b>			
Medical	6.17 $\pm$ 1.75	-	<0.001
Non-medical	4.39 $\pm$ 2.12		

\*Minimum score is 0, maximum score is 8

Perceptions and attitudes of respondents towards generic substitution and locally manufactured medications was examined (Table 3). More than half of the participants (54.4%) agreed that the pharmacist needs the doctor's confirmation in case of any generic substitution (n=229). On the other hand, 47% accepted generic substitution by the

**Table 3.** Perceptions and attitudes of patients towards generic substitution and locally manufactured medications.

Statement	n=421, (%)				
	SA	A	N	D	SD
Physicians should ask patients about their medication preference (generic or brand)	120 (28.5%)	154 (36.6%)	99 (23.5%)	42 (10%)	6 (1.4%)
Patients should have the option of choosing between generic and originator in the pharmacy	140 (33.3%)	187 (44.4%)	65 (15.4%)	25 (5.9%)	4 (1%)
I don't mind my prescribed medication to be substituted from originator to generic	127 (30.2%)	195 (46.3%)	65 (15.4%)	30 (7.1%)	4 (1%)
I don't mind the pharmacist substituting my prescribed medication to an equivalent locally produced one.	104 (24.7%)	186 (44.2%)	68 (16.2%)	55 (13.1%)	8 (1.9%)
I don't mind generic substitution of my chronic medication by the pharmacist.	85 (20.2%)	151 (35.9%)	86 (20.4%)	75 (17.8%)	24 (5.7%)
I don't mind generic substitution of my medication for minor ailment by the pharmacist.	119 (28.3%)	215 (51.1%)	50 (11.9%)	31 (7.4%)	6 (1.4%)
The pharmacist needs the doctor's confirmation in case of any generic substitution	93 (22.1%)	136 (32.3%)	84 (20%)	73 (17.3%)	36 (8.3%)
Only in case of shortage in brand medications, I accept generic substitution by the pharmacist	58 (13.8%)	139 (33%)	100 (23.8%)	109 (25.9%)	15 (3.6%)
I prefer to be prescribed locally produced medications	55 (13.1%)	104 (24.7%)	185 (43.9%)	63 (15%)	14 (3.3%)
I always stick to the same medication brand	78 (18.5%)	125 (29.7%)	136 (32.3%)	68 (16.2%)	14 (3.3%)
I prefer to be prescribed imported rather than locally produced medications	57 (13.5%)	102 (24.2%)	164 (39%)	84 (20%)	14 (3.3%)
I don't mind whether my prescribed / dispensed medication is locally produced or imported as long as it is effective	139 (33%)	193 (45.8%)	58 (13.8%)	24 (5.7%)	7 (1.7%)
Costs should be considered before a drug is prescribed	125 (29.7%)	182 (43.2%)	75 (17.8%)	31 (7.4%)	8 (1.9%)
Cost is not an issue for me as long as the medication will treat my condition	96 (22.8%)	188 (44.7%)	87 (20.7%)	41 (9.7%)	9 (2.1%)
A more expensive medication is a better one	26 (6.2%)	44 (10.5%)	96 (22.8%)	168 (39.9%)	87 (20.7%)

pharmacist only in case of shortage in brand medications (n=197), whereas 48% agreed that they always adhere to the same medication brand (n=203).

A relatively large percentage of participants (43.9%) were neutral when asked if they prefer to be prescribed locally produced medications (n=185). When asked if they prefer imported medications, 39% were also neutral (n=164). Two-third of the participants (67.5%, n = 284) agreed that cost is not an issue as long as the medicine will treat their condition. Most of the respondents (60.6%, n = 255) disagreed that a more expensive medicine is a better one. A large proportion of participants agreed on the pharmacist substituting both their chronic medication and their medication for minor ailment to a generic one. However, while 79.4% (n=334) accepted switching their minor ailment medication to a generic one, only 56.1% (n=236) accepted the substitution of their chronic medication.

Any significant correlation between demographic data and perceptions/attitudes towards generic and brand



**Table 4.** Statistical correlation between perceptions/attitudes towards generic and brand medications and demographic characteristics.

Statements		Private insurance/	Chronic medical	Employment	Monthly	Area of
		NSSF	conditions	status	income	living
The pharmacist needs the doctor's confirmation in case of any generic substitution	Chi-square	6.268	9.791	9.070	11.043	12.832
	Sig.	<b>.044</b>	.280	.170	.199	.118
Only in case of shortage in brand medications, I accept generic substitution by the pharmacist	Chi-square	.257	13.502	8.117	10.862	19.000
	Sig.	.879	.096	.230	.210	<b>.015</b>
I prefer to be prescribed locally produced medications	Chi-square	.543	9.824	12.457	26.646	10.618
	Sig.	.762	.278	.053	<b>.001</b>	.224
I always stick to the same medication brand	Chi-square	.592	7.041	20.026	13.386	24.192
	Sig.	.744	.532	<b>.003</b>	.099	<b>.002</b>
I prefer to be prescribed imported rather than local medications	Chi-square	2.556	10.372	14.327	24.836	8.823
	Sig.	.279	.240	<b>.026</b>	<b>.002</b>	.357
Cost is not an issue for me as long as the medication will treat my condition	Chi-square	1.028	8.770	6.846	23.591	3.958
	Sig.	.598	.362	.335	<b>.003</b>	.861
A more expensive medication is a better one	Chi-square	5.774	8.794	25.554	13.693	11.354
	Sig.	.056	.360	<b>.000</b>	.090	.182

medications was investigated as illustrated in Table 4. There was a significant correlation between insurance/NSSF coverage and the tendency of patients to ask for the doctor's confirmation before substituting their medications ( $p < 0.05$ ). Moreover, the preference of locally produced medication was significantly correlated with the monthly income ( $p < 0.01$ ). When asked about their tendency to choose imported generic medications, there was a significant correlation ( $p < 0.01$ ) between their answers and employment status, as well as their monthly income; interestingly, neutrality in answers was relatively dominant for retired participants (46.2%) and those with high monthly income (46.7%) (data not shown). Finally, the correlation between participants' employment status and their perceptions towards expensive medications was statistically significant ( $p < 0.01$ ); most of un-employed participants (70%) disagreed to the statement 'a more expensive medication is a better one' (data not shown).

## Discussion

Adequate knowledge and comprehension of patients about generic medications is of utmost importance for their acceptance. Misconceptions and negative beliefs are said to be important barriers to patients' usage of generic medications (Stewart et al. 2014; Colgan et al. 2015). This may result in serious health implications and avoidable expenses (Kesselheim et al. 2016). In our study, the majority of participants (66%–76.2%) had accurate knowledge about the quality, efficacy, safety and cost of generic medications compared to brands. Similarly, a study conducted in Adelaide, South Australia, showed that approximately half of the participants considered that generics have the same quality and effectiveness as their brand counterparts (Stewart et al. 2014). In contrast, a study in Alabama, USA reported that patients had a relatively poor knowledge regarding generic and brand drugs (Sewell et al. 2012). Likewise, in Bulgaria, the vast majority (94%) believed that generic medications are inferior to brands in terms of quality, efficacy and safety (Lebanova et al. 2012).

The present work revealed that only 56.1% of respondents did not mind the pharmacist substituting their brand

chronic medications with generic ones, whereas, 79.4% of them accepted substitution of minor ailment medications. The former percentage may reflect the uncertainty of patients in using generics when it is related to their serious medical conditions. Additionally, more than half of the participants (54.4%) agreed that the pharmacist must obtain the doctor's approval before giving any generic alternative. According to the WHO, patients' low perceived efficacy and safety, along with prescribers' concerns about efficacy and therapeutic equivalence, are common reasons for generic medicines' underuse (O'Leary et al. 2015). Physicians and pharmacists play critical roles in the prescription and distribution of generics (Čatić et al. 2017). Despite the fact that generic medication use has increased, there is an evidence that many health care professionals have negative attitudes toward generics (Chong et al. 2011; Shrank et al. 2011). Unfortunately, some healthcare practitioners lack adequate knowledge about generics, hence, reflecting their hesitancy in prescribing these products. Most of them have concerns about their efficacy in treating medical conditions, and this is becoming a significant obstacle to the broader use of generic medications (Belay 2017). The majority of health care providers would still suggest a brand medication if available regardless of the fact that they have found generics to be of equal quality and efficacy as brand medications (Čatić et al. 2017). Consequently, the acceptance of substituting the brand medication by a generic one is affected. In Istanbul, 26% of the patients immediately accepted the substitution given by the physician, while only 10% accepted it from the pharmacist (Toklu et al. 2012). Likewise, a study conducted in Poland has revealed that the opinions of doctors (4 on a 5-point scale) were shown to have an impact on respondents' attitudes about generics and, to a lesser extent, opinions of pharmacists (3.78 on a 5-point scale) (Dunne and Dunne 2015).

Attitudes and perceptions of participants towards locally produced medications in our study showed that only 37.8% of the participants revealed preference for locally produced medications. The majority of this category of respondents (51.7%) had a low income (data not shown), hence, justifying their tendency to purchase local medications that are usually less costly. Similarly, in Addis Ababa, perceptions and attitudes of patients were inferior despite

the fact that most of survey participants had adequate understanding on the notion of generic medicines (Nasir et al. 2019). Likewise, another study conducted in Latvia, showed that the population is familiar with generic drugs, yet, only a small percentage of patients would choose them if offered the choice (Salmane Kulikovska et al. 2019).

A previous study conducted in Jordan showed high confidence and trust by Jordanians in generic medications manufactured locally (El-Dahiyat and Kayyali 2013). In contrast, large numbers of patients in Ethiopia had a negative view of the efficacy and safety of domestic medications (Redwan et al. 2018). The same applies in UAE, where most patients believed that imported medications are of higher quality, more reliable, and more prescribed than drugs manufactured locally (Sharif et al. 2016).

When asked about their preference for imported rather than local medications, agreement level reached 37.7%. Such finding was in alignment with an earlier study conducted in Ethiopia recording 41.1% agreement (Gebresillassie et al. 2018). It is noteworthy to mention that a high percentage of participants in the current study were neutral about their preference (43.9% and 39%) for local and imported medications, respectively. This could be attributed to the ambiguity of their decision and would signify their tendency to change positively their perceptions towards local pharmaceutical products, with some education and support from healthcare professionals. On the other hand, an earlier study conducted in Asmara, Eritrea, reported patients' negative perception about locally manufactured paracetamol and their preference towards the more expensive paracetamol brand, even though laboratory specifications of the local product met the norms (Idris et al. 2021).

## References

- Almohammed OA, Aldwihi LA, Alhifany AA (2020) Public knowledge, perception, and experience with generic medications in Saudi Arabia. *Saudi Medical Journal* 41: 413–20. <https://doi.org/10.15537/SMJ.2020.4.24992>
- Belay Y (2017) Assessment of knowledge, attitude and practice of pharmacy professionals toward generic medicines, Northern Ethiopia, Mekelle: a cross sectional study. *Journal of Basic and Clinical Pharmacy* 8: 193–9.
- Čatić T, Avdagić L, Martinović I (2017) Knowledge and attitudes of physicians and pharmacists towards the use of generic medicines in Bosnia and Herzegovina. *Medicinski Glasnik* 14: 25–32. <https://doi.org/10.17392/867-16>
- Chaudhary RK, Philip MJ, Santhosh A, Karoli SS, Bhandari R, Ganachari MS (2021) Health economics and effectiveness analysis of generic anti-diabetic medication from jan aushadhi: An ambispective study in community pharmacy. *Diabetes and Metabolic Syndrome: Clinical Research and Reviews* 15(6): e102303. <https://doi.org/10.1016/j.dsx.2021.102303>
- Chong CP, Hassali MA, Bahari MB, Shafie AA (2011) Exploring community pharmacists' views on generic medicines: A nationwide study from Malaysia. *International Journal of Clinical Pharmacy* 33: 124–131. <https://doi.org/10.1007/s11096-010-9470-1>
- Colgan S, Faasse K, Martin LR, Stephens MH, Grey A, Petrie KJ (2015) Perceptions of generic medication in the general population, doctors and pharmacists: a systematic review. *BMJ Open* 5: e008915. <https://doi.org/10.1136/bmjopen-2015>
- Dimassi H, Maroun AB, Saadeh M, Khabsa J, Abdou J-L, Saleh S (2020) Views of community pharmacists in Lebanon on the unified prescription: a mixed method study. *Eastern Mediterranean Health Journal* 26: 1539–1547. <https://doi.org/10.26719/emhj.20.127>
- Dong X, Tsang CCS, Kotian A, Zeng J, Tran M, Wang J (2021) A comparison between the effects of drug costs and share of family income on drug costs in determining drug price. *Medicine* 100: e26877. <https://doi.org/10.1097/MD.00000000000026877>
- Dunne SS, Dunne CP (2015) What do people really think of generic medicines? A systematic review and critical appraisal of literature on stakeholder perceptions of generic drugs. *BMC Medicine* 13: e173. <https://doi.org/10.1186/s12916-015-0415-3>
- El-Dahiyat F, Kayyali R (2013) Evaluating patients' perceptions regarding generic medicines in Jordan. *Journal of Pharmaceutical Policy and Practice* 6: 1–3. <https://doi.org/10.1186/2052-3211-6-3>
- Gebresillassie BM, Belachew SA, Tefera YG, Abebe TB, Mekuria AB, Haile KT, Erku D (2018) Evaluating patients', physicians' and phar-

Interestingly, the current work revealed that the majority of the participants (60.6%) did not perceive that a more expensive medication is a better one. All the above findings would contribute to the encouragement for the use of generic medications, by stressing on their lower cost and equivalent safety and efficacy when compared to their brand counterparts.

## Conclusions

The study findings showed that Lebanese citizens have a rich knowledge regarding generic medications, either imported or locally manufactured, and relatively optimistic attitudes and perceptions towards their use. The recent economic situation was a key factor in accepting generic substitution. However, the uncertainty about the use of these medications, particularly those treating chronic illness is still an obstacle to overcome. Awareness campaigns about locally produced pharmaceuticals conducted by the Ministry of Public Health, and targeting both, patients and health care providers are of prime importance. Moreover, media coverage about the high standards used in our local manufacturing firms could leverage patients' trust in local medications. Additionally, financial support for these firms should be considered to increase the production of high-quality medicines, to cover as many medical conditions as possible and to reach national sufficiency. Lastly, a great responsibility rests with health care professionals, including physicians and pharmacists, as their fundamental role in educating patients and promoting generic medicines can influence consumers' acceptance and generic substitution.

- macy professionals' perception and concern regarding generic medicines in Gondar town, northwest Ethiopia: A multi-stakeholder, cross-sectional survey. *PLoS ONE* 13(11): e0204146. <https://doi.org/10.1371/journal.pone.0204146>
- Gemayel F (2022) How the new subsidy halt will (finally) give Lebanese industry a boost. <https://today.lorientlejour.com/article/1295033> [Accessed 1 February 2023]
- He JH, Shang DW, Wang ZZ, Li XF, Wen YG (2022) Physicians' perceptions of generic drugs in China. *Health Policy Open* 3: e100067. <https://doi.org/10.1016/j.hopen.2022.100067>
- Huang T, Bai L, Wushouer H, Wang Z, Yang M, Lin H, Shen P, Guan X, Shi L (2022) Clinical outcome and medical cost of originator and generic antihypertensive drugs: a population-based study in Yinzhou, China. *Frontiers in Pharmacology* 13: e575398. <https://doi.org/10.3389/fphar.2022.757398>
- Idris IM, Hassan DN, Hassen HA, Araya RZ, Weldemariam DG (2021) Consumers' perception of generic medicines and evaluation of in vitro quality control parameters of locally manufactured paracetamol tablets in asmara, eritrea: a cross-sectional study. *BioMed Research International* 2021: e6642826. <https://doi.org/10.1155/2021/6642826>
- El Jamal N, Usta U, Nasrallah M, Al-Chaer E, Hamadeh G (2020) Solutions for the “Vanishing Drug” conundrum in Lebanon: a change in the subsidy system coupled with a digital prescribing platform. <http://Arab-ReformNet/Publication> [Accessed 08 July 2022]
- Kesselheim AS, Gagne JJ, Franklin JM, Eddings W, Fulchino LA, Avorn J, Campbell E (2016) Variations in patients' perceptions and use of generic drugs: results of a national survey. *Journal of General Internal Medicine* 31(6): 609–614. <https://doi.org/10.1007/s11606-016-3612-7>
- Lebanese Ministry of Public Health (2022) Launching of the unified medical prescription. <https://www.moph.gov.lb/en/Pages/127/1456/meeting-at-moph-concerning-the-unified-medical-prescription>
- Lebanova H, Manolov D, Getov I (2012) Patients' attitude about generics-Bulgarian perspective. *Marmara Pharmaceutical Journal* 16(1): 36–40. <https://doi.org/10.12991/201216418>
- Lewis E (2020) Pharmaceutical drugs in Lebanon, explained. <https://today.lorientlejour.com/article/1236592> [Accessed 10 July 2022]
- Mansilla C, Cárdenas J, Kaplan WA, Wirtz VJ, Kuhn-Barrientos L, de Zárate MO, Tobar C, Herrera C (2017) Evaluation of the effects of a generic substitution policy implemented in Chile. *BMJ Global Health* 2: e000922. <https://doi.org/10.1136/bmjgh-2018-000922>
- Mikulic M (2022) Proportion of branded versus generic drug prescriptions dispensed in the United States from 2005 to 2022. <https://www.statista.com/statistics/205042/proportion-of-brand-to-generic-prescriptions-dispensed> [Accessed 12 November 2022]
- Nasir BB, Muhammed OS, Buseir MS (2019) Assessment of knowledge, attitude and practice among pharmacy professionals towards generic medicines in Addis Ababa, Ethiopia. *Journal of Generic Medicines: The Business Journal for the Generic Medicines Sector* 15: 185–192. <https://doi.org/10.1177/1741134319875764>
- O'Leary A, Usher C, Lynch M, Hall M, Hemeryk L, Spillane S, Gallagher P, Barry M (2015) Generic medicines and generic substitution: Contrasting perspectives of stakeholders in Ireland. *BMC Research Notes* 8: e790. <https://doi.org/10.1186/s13104-015-1764-x>
- Redwan W, Abubeker H, Gebremedhin B, Zelalem T (2018) Consumers' Perception towards Domestically Manufactured Medicines, Addis Ababa, Ethiopia: A Cross-Sectional Survey. *Sudan Medical Journal* 54: 129–140. <https://doi.org/10.12816/0051880>
- Saleh S, Abou Samra C, Jleilaty S, Constantin J, El Arnaout N, Dimassi H, Al-Bittar D (2017) Perceptions and behaviors of patients and pharmacists towards generic drug substitution in Lebanon. *International Journal of Clinical Pharmacy* 39: 1101–1109. <https://doi.org/10.1007/s11096-017-0509-4>
- Salmene Kulikovska I, Poplavska E, Ceha M, Mezinska S (2019) Use of generic medicines in Latvia: Awareness, opinions and experiences of the population. *Journal of Pharmaceutical Policy and Practice* 12: 1. <https://doi.org/10.1186/s40545-018-0159-5>
- Sewell K, Andreae S, Luke E, Safford MM (2012) Perceptions of and barriers to use of generic medications in a rural African American population, Alabama, 2011. *Preventive Chronic Disease* 9: e120010. <https://doi.org/10.5888/pcd9.120010>
- Sharif SI, Chaar RJ, Albadrani ZZ, Shahwan JS, Badreddin MN, Charbaji MAK (2016) Evaluation of the knowledge and perceptions of patients towards generic medicines in UAE. *Pharmacology & Pharmacy* 7(9): 369–78. <https://doi.org/10.4236/pp.2016.79045>
- Shrank WH, Liberman JN, Fischer MA, Girdish C, Brennan TA, Choudhry NK (2011) Physician perceptions about generic drugs. *Annals of Pharmacotherapy* 45(1): 31–38. <https://doi.org/10.1345/aph.1P389>
- Stewart K, Alrasheedy A, Hassali A, Kong D, Aljadhey H, Ibrahim M, Al-Tamimi S (2014) Patient knowledge, perceptions, and acceptance of generic medicines: a comprehensive review of the current literature. *Patient Intelligence* 6: 1–29. <https://doi.org/10.2147/pi.s46737>
- Straka RJ, Keohane DJ, Liu LZ (2015) Potential clinical and economic impact of switching branded medications to generics. *American Journal of Therapeutics* 24: 278–289. <https://doi.org/10.1097/MJT.0000000000000282>
- Thakkar K, Billa G (2013) The concept of: generic drugs and patented drugs vs. brand name drugs and non-proprietary (generic) name drugs. *Frontiers in Pharmacology* 4: e113. <https://doi.org/10.3389/fphar.2013.00113>
- Toklu H, Dülger GA, Hidiroğlu S, Akici A, Yetim A, Gannemoğlu H, Günes H (2012) Knowledge and attitudes of the pharmacists, prescribers and patients towards generic drug use in Istanbul-Turkey. *Pharmacy Practice* 10(4): 199–206. <https://doi.org/10.4321/S1886-36552012000400004>