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Knowledge, attitude, perception, and practices of generic substitution of community pharmacists in the north al -Batinah governorate of Oman: a pilot study

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ABSTRACT

Background: The availability of generic drugs in the drug markets has increased noticeably, and generic substitution is a regular practice in many countries. The current study assesses community pharmacists' knowledge, attitude, perception, and practices toward generic drug substitution in the North Al-Batinah Governorate of Oman. **Methods:** This is a cross-sectional survey. A self-administered questionnaire was distributed to a convenience sample of community pharmacists in the North Al Batinah Governorate, Oman. The survey was conducted for three months, from November 2018 to January 2019. The data collected was analyzed using SPSS-IBM v20. **Results**: A total of 60 community pharmacies were surveyed, with a response rate of 86%. The study assessed the responses of 53 community pharmacists who met the inclusion criteria, the majority (73.6%, n=39) were men, 49.1% (n=26) of the pharmacist were in the age group of 25-30 years, and 73.6% (n=39) of the pharmacists were Indian. The study observed that the average knowledge score was 6.83 (±1.46). A high percentage of community pharmacists were aware that generic medicines and brands are bioequivalent (81.1%) and can be substituted in medical treatments (88.7%), and 86.8% knew that generics are in similar chemical structures and drug safety profiles. In addition, most pharmacists (92%) were familiar with the generic medication of most brands in the market. Community pharmacists indicated that bonuses, incentives, patient demand for the medicine, and manufacturer credibility influenced their stocking and dispensing of generic medicine in the community pharmacies. **Conclusion:** Pharmacists showed a positive attitude towards generic drugs and highly supported generic substitution of generics in community pharmacies. However, educational intervention/continuing education training programs are required to improve generic medicine dispensing practices among community pharmacists.

Keywords: Generic Medicines; Community Pharmacists; Knowledge; Brand; Oman.

INTRODUCTION

Oman has invested heavily in the health sector and thrived in building a reasonably modern health care system. Health expenditures are growing in Oman due to the government's mission to provide all citizens with basic health care, covering treatment for persistent diabetes and cardiovascular disease (1). Oman's public health care costs are increasing progressively, and future public investment will need to continue to increase to meet this demand. In the coming years, the private sector may take on an increasingly major role in supplying medical treatment and care.

Recently there was a considerable increase in the use of generic drugs. This is because the low cost of generic drugs can reserve funds for medicine consumption. According to the World Health Organization (WHO), generic drugs are recognized as pharmaceutical products that can be typically interchangeable with an innovator product and are manufactured without a license from the innovator company and marketed after the expiration date or other exclusive rights (2). In addition, drug regulatory authorities such as the Food and Drugs Administration (FDA) ensure that a generic drug and a brand-name product comprise a similar active ingredient in the same amount and dose (3).

Several studies reported that the cost-effective method to limit health care costs on pharmaceuticals is the usage of generic medicines, which brings substantial savings to the people and the government. Therefore, an alternative method for cutting down expenditure on medicines without affecting the treatment quality could be generic medicine substitution instead of branded medicines. A generic medicine is considered to have an acceptable bioequivalent range compared to branded medicine and is available at a lower cost (4, 5).

In Oman, no criteria exist to guide drug control in regulating the number of brand-name products of any particular product, and no specific requirements concerning the generic name on labels. However, for pharmaceutical product registration, prominent generic name labeling is required. According to Oman's drug selection policy, medicines are listed according to their generic or International Non-proprietary Name (INN). Furthermore, the Oman national drug policy 2000 encourages the use of generic names in the ordering, drug supply, prescribing, and dispensing of drugs by all government health care staff (6). Furthermore, the Oman National Formulary 2016 stipulates that the physician should prescribe the drug in generic names to minimize confusion caused by the many trade names given to one generic molecule. Moreover, in the preface to the list of approved drug emissions, drugs must be prescribed by generic name by the commitment of the ministry of health (MOH) to the essential drug concept and states. This will also limit the confusion caused by the many exchange names given to one generic drug.

Purchasing medicines for public health is usually rendered through tenders where the health professionals do not influence the process. Therefore, depending on availability, health professionals were obliged to prescribe and dispense medicines, and the patients could often be substituted with brand-name drugs and generic drugs or vice-versa. In contrast, health professionals in the private sector have absolute freedom to prescribe and dispense brand-name drugs or their generic substitutes depending on physicians' or patients' preferences or stock availability (5).

The WHO/HAI pricing survey, conducted in Oman in 2007 regarding the availability and affordability of generic drugs, reported that the availability of originator medicines in the public sector was 15.6 %, while the lowest priced generic (LPG) medicines availability was 70.2 %. On the other hand, in the private sector, the availability was 49.4 % for the originator and 55.3 % for generics. However, there are reports regarding the quality of generic medicines and their substitution that may likely impact patients' adherence to therapy (7, 8).

Several studies have explored community pharmacists' views and practices on generic medicine substitution and stated positive benefits, including cost reduction in treatment and increased medicine accessibility to the public (7-10). However, no studies have been recorded in Oman assessing community pharmacist knowledge about generic medicines and their practice behaviors in dispensing these drugs. Therefore, this will be the first study in Oman to focus on this issue.

In the context of the enhanced role of the pharmacist from a mere dispenser of medicines to a counselor and decision-maker, it is essential to evaluate community pharmacists' knowledge, perception, and attitudes about the

use of generic drugs and substitution. Therefore, the present study aimed to assess community pharmacists' knowledge, attitude, perception, and practices regarding the substitution of generic drugs in the North Al-Batinah Governorate of Oman.

METHODS

Study Design, study setting, and population

This is a cross-sectional survey. A self-administered questionnaire was used to assess knowledge, attitude, perception, and practices of generic drug substitution among the community pharmacists in the northern Al-Batinah Governorate of Oman from November 2018 to January 2019.

Study tools

The data collection form was built from scratch, and it was influenced by several studies, including Awaisu et al. (10), Shraim et al. (11), and Al-Arifi (12). The first draft of the questionnaire was initially developed consisting of five sections amended from the literature (10, 11, 13), which was being used to record I) Demographic information about community pharmacists, II) knowledge of generic drugs among community pharmacists III) The attitude of community pharmacists, IV) Pharmacists' practice in administering the generic drugs (14).

The questionnaire was tested in a pilot among ten community pharmacists. The reliability test showed Cronbach's alpha of 0.768 for attitude questions, 0.806 for perception questions, and 0.707 for the practice of community pharmacists concerning generic drugs. The questionnaire was modified based on the pilot study results, and the final version was used for the survey. The pilot study data were excluded from the main study.

The responses to knowledge-based questions were recorded as 'Yes,' 'No,' or 'Unsure.' The correct answer for each generic medicine knowledge question was given a score of 1, and 0 for the wrong answer, "unsure," got a score of 0 because it indicates that the pharmacist does not know the answer. The highest possible score attainable was ten, and the lowest was 0. On the other hand, responses were assessed using a 5-point Likert scale for attitudes, perception, and practice behavior-based items.

Sample size

According to the 2017 annual report issued by the Directorate General of Pharmaceutical Affairs & Drug Control (DGPA &DC), there are 117 community pharmacies in the North Al –Batinah Governorate. The convenience sampling technique included 60 community pharmacies proportionally from six states of the North Al-Batinah governorate. The required sample size (n=90) was calculated using the Raosoft® online calculator based on a confidence level of 95% and a 5 % error margin. Community pharmacists satisfying the study criteria were enrolled in the study.

Inclusion criteria and exclusion criteria

The study included all registered pharmacists employed full-time in community pharmacies of the North Al-Batinah Governorate, registered pharmacists possessing a work experience of at least one month in the community pharmacy, and registered pharmacists working in the chain or independent community pharmacy. While pharmacists/interns working part-time in community pharmacies in the North Al - Batinah Governorate and pharmacists employed full-time in in-house

pharmacies of the North Al- Batinah Governorate were excluded.

Statistical analysis

The collected data were entered and analyzed in SPSS-IBM version 20.0. Both descriptive and analytic statistics were applied to analyze the data. Categorical variables were depicted in numbers and percentages, and continuous variables were described as mean and standard deviation (SD).

RESULTS

Socio-demographic

The survey was conducted in 60 community pharmacies involving 6 states in the North Al- Batinah Governorate for three months, from November 2018 to January 2019, to assess the knowledge, Perceptions, and generic substitution practices. Among the 61 questionnaires, only 53 questionnaires were completed and received. The response rate to the survey was 86 %; the results are shown in (Table 1).

The survey analysis showed that among the total study population (n=53), the majority (73.6%, n=39) of the respondents were male, and (26.4%, n=14) were female. Furthermore, the age of the respondents ranged from 25 to 45 years (M±*SD*, 36.01 ±*6.48*).

More than half of the pharmacists worked (58.5%, n=31) in chain pharmacies, while (41.5%, n=22) worked in individual pharmacies. The work experience of the pharmacists in the current pharmacies ranged from 1 month to 20 years. Approximately 49.1% (n=26) of the pharmacists had work experience between 6-10 years, while 43.4 %(n=23) had work experience between 1-5 years in the current pharmacies where they worked. The total work experience of the pharmacists in the community pharmacies ranged from 1 to 28 years. The mean work experience was 10.53 (±6.61) years. About 30.8 %(n=16) of the pharmacists had work experience between 6-10 years, followed by 26.9% (n=14) of pharmacists with work experience of 11-15 years. There have been various nationalities, 73.6% (n=39) Indian, 15.1% (n=8) Egyptian, 7.5% (n=4) Pakistani, and 3.8% (n=2) Omani pharmacists.

Table (1): Socio-demographic of participants (N=53)

Item	Frequency	Percentage
Gender		
Male	**14**	**26%**
Female	**39**	**74%**
Age group in years		
25-35	26	49.1
36-45	23	43.4
46-55	4	7.5
Work Experience in years		
Less than 1 year	2	3.8
1-5 years	23	43.4

Item	Frequency	Percentage
6-10 years	26	49.1
11- 15 years	1	1.9
16-20 years	1	1.9
Total work experience		
1-5 years	12	23.1
6-10 years	16	30.8
11-15 years	14	26.9
16-20 years	6	11.5
21-25 years	3	5.8
Above 26 years	1	1.9
Working setting		
Chain pharmacy	31	42%
Individual pharmacy	22	58%
Level of pharmacy education		
Bachelor	30	57%
MSc.	18	34%
Pharm D.	5	9%
Nationality		
Indian	39	73.6%
Egyptian	18	15.5%
Pakistani	4	7.5%
Omani	2	3.8%

Knowledge of community pharmacists on generic drugs

The study observed that the average knowledge score of 10 items that assessed the knowledge of the community pharmacist about generic drugs was 6.83 (±1.46); the total marks ranged between 9 out of 10 and 2 out of 10. The average percentage of correct responses to the ten items was 68.5 %. (Table 2) presents the understanding of generic drugs.

Table (2): Community pharmacists' knowledge about generic drugs (N=60).

Items	Yes	No	Unsure	Correct response (%)
The term 'generic medicine' is a drug product marketed under the drug's non-	24 (45%)	2 (3.8%)	27 (50.9%)	45.3%

Items	Yes	No	Unsure	Correct response (%)
proprietary approved name or a product marketed under a different brand name(proprietary) name				
Generic medicines and brand name medicines are bio-equivalent	43 (81.1%)	3 (5.7%)	7 (13.2)	81.1%
If a generic medicine and a branded medicine are bio-equivalent, it means that they are also therapeutically equivalent	47 (88.7%)	5 (9.4%)	1 (1.9%)	88.6%
Generic medicine and branded medicine have the same effectiveness in treating diseases	45 (84.9%)	6 (11.3%)	2 (3.8%)	84.9%
The branded medicine can be substituted with generic drugs for medical treatments	47 (88.7%)	3 (5.7%)	3 (5.7%)	88.7%
Generic medicine has the same drug safety profile as the branded medicine	46 (86.8%)	3 (5.7%)	4 (7.5%)	86.8%
Generic medicine has the same chemical structure as the branded medicine	46 (86.8%)	4 (7.5%)	3 (5.7%)	86.8%
Excipients (inactive ingredients) used in generic medicines may differ from the branded medicine	34 (64.2%)	14 (26.4%)	4 (7.5%)	64.2%
Generic medicines are subject to clinical trials	43 (81.1%)	7 (13.2%)	3 (5.7%)	13.2%
Generic medicines are subject to monitoring upon market launching	24(45.3%)	5 (9.4%)	24 (45.3%)	45.3%

The study results showed that most community pharmacists (88.7%; n = 47) had a correct knowledge of generic medicines, which can substitute brand-name medicines for medical treatments. Approximately 88.6% (n= 47) of the pharmacists correctly understood that if a generic and a branded medicine are bioequivalent, they are also therapeutically equivalent. Community pharmacists (86.8%; n = 46)) had a correct awareness of generic medicines, with the same chemical structure and drug safety profile as branded medicines. Similarly, 84.9 % (n= 45) and 81.1 %(n=43) of the community pharmacists correctly understood that generic and branded medicine have the same effectiveness in treating diseases and that generic medicines and brand-name drugs are bio-equivalent, respectively. However, only 13% (n=7) of community pharmacists knew that generic medicines are not clinical trials. Less than half (45 %; n=24) of the community pharmacists knew the definition of ge-

neric medicine, and the generic drugs are subject to monitoring upon their launch in the market.

The attitude of community pharmacists about generic drugs

The statements used in this section dealt with the attitude of community pharmacists toward generic drugs. Detailed results are illustrated in (Table 3). Among the community pharmacists, more than half (34 %; n=18) of pharmacists agreed with the attitudinal item that to perform generic substitution; the pharmacist must consult the prescribing physician. The majority (92.4%; n=49) of the pharmacists agreed that they are familiar with generic medications from most branded medicines available on the market. Furthermore, a high percentage (90.5 %; n=48) of community pharmacists showed a positive attitude toward the dispense of generic substitution, especially for patients who cannot afford the price of branded drugs due to their price differences. Most pharmacists (77.3 %; n=41) agreed to support generic substitution for brand drugs in all cases where it is available, and the intensity of promotional activities plays an essential role in the sale of generics. A high percentage (88.6; n=47) of community pharmacists agreed that clarifications should be provided to patients about the reasons for choosing generic drugs.

Interestingly (75.5%; n= 40), community pharmacists agreed they have the right to do the generic substitution. The majority (69.8 %; n=37) of the community pharmacists agreed to administer generic medicine to their patients. However, more than half (54.7; n=27) of community pharmacists agreed that larger generic medicines could lower the amount of money spent on research and developing new pharmaceuticals.

Table (3): Community pharmacists' attitude regarding generic drugs.

Items	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Mean (±SD)
Wider use of generic medicines will mean that less money will be spent on research and development of new pharmaceuticals	9 (17%)	20 (37.7%)	23 (43.4%)	1 (1.9%)	0	3.69 (±0.77)
I support generic substitution for brand drugs in all cases where a generic is available	8(15.1%)	33 (62.3%)	3 (5.7%)	7(13.2%)	2 (3.8%)	3.71 (±1.0)
I am familiar with generic medicines of	12 (22.6%)	37 (69.8%)	3 (5.7%)	0	1 (1.9%)	4.11 (±0.66)

Items	Strongly agree	Agree	Unde-cided	Disagree	Strongly disagree	Mean (±SD)
most branded medicines available on the market						
Patients should be given enough explanations about the reasons for choosing generic medicines for them	6(11.3%)	41 (77.4%)	2 (3.8%)	4 (7.5%)	0	3.92 (±0.67)
Community pharmacists must consult the prescribing physician when performing generic substitution	7(13.2%)	11 (20.8%)	4 (7.5%)	26 (49.1%)	5 (9.4%)	2.79 (±1.26)
Community pharmacists in Oman should be given generic substitution right	8(15.1%)	32 (60.4%)	6 (11.3%)	4 (7.5%)	3 (5.7%)	3.71 (±1.0)
The intensity of promotional activities by medical representatives plays an important role in dispensing generics	28 (52.8%)	13 (24.5%)	3 (5.7%)	7(13.2%)	2 (3.8%)	4.09 (±1.21)
The price difference between generic and branded drugs is often so great that I feel I must dispense prescriptions with generic substitution, especially for patients who cannot afford the price of branded drugs	19 (35.8%)	29 (54.7%)	3 (5.7%)	2 (3.8%)	0	4.22 (±0.72)
In general, I would dispense generic medicine to my patients	7(13.2%)	30 (56.6%)	5 (9.4%)	6(11.3%)	5 (9.4%)	3.5 (±1.15)

The perception of community pharmacists about generic drugs

The statements in this section were used to explore community pharmacists' perceptions of generic drugs. (Table 4) represents the perception of community pharmacists about generic medicines.

Among the total (n = 53) community pharmacists, the majority (84.9%; n=45) of the pharmacists opined that the quality use of generic medicines among Omani consumers could be achieved if physicians and pharmacists worked together. Interestingly (79.2%; n= 42), community pharmacists opined that a standard guideline on brand substitution for community pharmacists is required in Oman. However, surprisingly, only 13.2 %(n= 7) of community pharmacists agreed that it is inappropriate to substitute generic drugs with a narrow therapeutic index.

In addition, a community pharmacist was asked to provide his opinion on factors affecting the distribution and stocking of generic medicines. More than three-fourths (79.2%; n= 42) of the pharmacists opined that the bonuses and incentives offered by pharmaceutical companies on their products would influence the choice of medicine selection. Additionally, the majority (64.1%; n= 34) of the pharmacist opined that the ads made by the drug companies would influence the distribution of the branded medicines, while two-thirds (66%; n=35) indicated that the patient considers the generic not as effective as the brand medicine. Furthermore, (62.2 %; n= 33) pharmacists opined that those patients do not agree with switching from brand to generic medicine during the therapy. A similar percentage, 64% (n=34), of pharmacists indicated that patient demand for the medicine would influence its distribution. The credibility of the generic drug manufacturers is a concern when stocking medicines in the pharmacy.

Community pharmacists were also asked to comment on the availability and benefits of using generic drugs. More than three-fourths (77.5%; n= 41) of the community pharmacists believed that there is enough availability of locally manufactured generics in the Oman market. About 73.5 % (n=39) of the participants indicated a wider range of generic drug availability in their pharmacies. Above two-thirds (67.9%; n= 36) of the community, pharmacists opined that greater use of generic drugs helps decrease the health care expenditure of the Oman government. More than half (58.4% n=31) of the pharmacist believed that locally manufactured generic medicines are the same in quality, efficacy, and safety compared to imported generic medicines.

Table (4): Community pharmacists' perception regarding generic drugs.

Items	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Mean (SD)
Do you recommend alternatives for branded medicines to your patients	4 (7.5%)	40 (75.5%)	7 (13.2%)	2 (3.8%)	0	3.86 (±0.58)
If patients are satisfied with	2 (3.8%)	3(5.7%)	1 (1.9%)	39 (73.6%)	8(15.1%)	2.09 (±0.86)

Items	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Mean (SD)
generic medicines more than branded medicines, do you try to change their minds to take brands						
If a patient comes complaining about a generic drug, do you shift him to a brand without referring him to his doctors	1(1.9%)	8(15.1%)	1 (1.9%)	37 (69.8%)	6(11.3%)	2.26 (±0.92)
I often dispense a generic medicine whenever there is a request for over-the-counter (OTC) medication	9 (17%)	36 (67.9%)	0	6(11.3%)	2 (3.8%)	3.83 (±0.97)
I prefer to stock and dispense generic medicines because the companies provide a good bonus scheme	3 (5.7%)	24 (45.3%)	1 (1.9%)	20(37.7%)	5 (9.4%)	3.00 (±1.20)

The practice of community pharmacists concerning generic drugs

(Table 5) presents the 'practices' of community pharmacists in dispensing generic medicines. More than three-quarters (83%;

n=44) of the pharmacists agreed to recommend an alternative to a branded medicine to their patients. A high percentage (81.1%; n=43) of pharmacists indicated that they would never try to change their minds to take the brands if they were satisfied with generics.

Table (5): Community pharmacists' practice regarding generic drugs.

Items	Strongly agree	Agree	Undecided	Disagree	Strongly Disagree	Mean (±SD)
There is a wide range of generic medicines available in my pharmacy	7(13.2%)	32 (60.4%)	0	11 (20.8%)	3 (5.7%)	3.54 (±1.13)
There is enough availability of locally manufactured generics medicines in the Oman market	2 (3.8%)	39 (73.6%)	4 (7.5%)	7(13.2%)	1 (1.9%)	3.64 (±0.83)
Locally manufactured generic medicines are equal in their quality, efficacy, and safety compared to the imported generic medicines	2 (3.8%)	29 (54.7%)	7(13.2%)	9 (17%)	6(11.3%)	3.22 (±1.13)
The credibility of the generic medicine	3 (5.7%)	31 (58.5%)	9 (17%)	6 (11.3%)	4 (7.5%)	3.43 (±1.02)

Items	Strongly agree	Agree	Undecided	Disagree	Strongly Disagree	Mean (±SD)
manufacturers is a concern when stocking medicines in the pharmacy						
Patients believe that generic medicine is not as effective as the brand medicine	6 (11.3%)	29 (54.7%)	1 (1.9%)	15 (28.3%)	2 (3.8%)	3.41 (±1.1)
Patients disapprove of switching from brand medicine to generic medicine during the therapy	4 (7.5%)	29 (54.7%)	3 (5.7%)	13 (24.5%)	4 (7.5%)	3.30 (±1.1)
Substitution of generic medicines having a narrow therapeutic index is inappropriate	4 (7.5%)	3 (5.7%)	10 (18.9%)	34 (64.2%)	2 (3.8%)	2.5 (±0.95)
I feel that patient's demand for the medicine will influence dispensing it	2 (3.8%)	32 (60.4%)	8 (15.1%)	10 (18.9%)	1 (1.9%)	3.45 (±0.91)

Items	Strongly agree	Agree	Undecided	Disagree	Strongly Disagree	Mean (±SD)
In my opinion, quality use of generic medicines among Omani consumers can be achieved if both physicians and pharmacists work together	7 (13.2%)	38 (71.7%)	4 (7.5%)	2 (3.8%)	2 (3.8%)	3.86 (±0.83)
Pharmaceutical companies' product bonuses and incentives will influence the choice of medicines selection	5 (9.4%)	37 (69.8%)	0	9 (17.0%)	2 (3.8%)	3.64 (±1.0)
I believe that the advertisements made by the drug companies will influence dispensing of branded medicines	5 (9.4%)	29 (54.7%)	1 (1.9%)	12 (22.6%)	6 (11.3%)	3.28 (±1.24)
Wider use of generic medicines	6 (11.3%)	30 (56.6%)	3 (5.7%)	8 (15.1%)	6 (11.3%)	3.41 (±1.21)

Items	Strongly agree	Agree	Undecided	Disagree	Strongly Disagree	Mean (±SD)
in Oman helps in decreasing the health care expenditure of the government						
I believe Oman needs a standard guideline on the brand substitution process for the community pharmacist	6 (11.3%)	36 (67.9%)	6 (11.3%)	4 (7.5%)	1 (1.9%)	3.79 (±0.81)

However, if the patients complained about generic drugs, most pharmacists reported they would switch the patient from generic to a referral to the doctor. Interestingly (85%; n=45), community pharmacists frequently dispense a generic drug when OTC medication. In addition, nearly half of community pharmacists preferred to stock and administer generic medicines because of the good bonus scheme offered by pharmaceutical companies.

DISCUSSION

The study assessed community pharmacists' knowledge, perceptions, attitude, and generic substitution practices in the North Al-Batinah governorate. The present study observed a response rate of 86%, a slightly higher response rate of 81% in the Saudi study(9), similar to the Palestinian and Ethiopian studies. The higher response rate in the present study could be the short time required to complete the questionnaire and repeated follow-ups with the target population through pharmacy visits and telephone reminders.

In the present study, the majority (73.6%) were male pharmacists, which is higher than the studies carried out in Palestine(11) and Ethiopia (8), where the percentage of male pharmacists was almost half. Furthermore, almost half of the present study was from the age group of 25-35 years, similar to the Saudi study (9). In the current study, the majority (73.6%) of the community, pharmacists, were Indians, while in a Saudi study, almost half of the study population was Egyptian(9).

The present study indicated that community pharmacists had adequate knowledge about generic drugs. The mean knowledge score of community pharmacists towards generic drugs was 6.83 (±1.46), and the mean correct responses were 68.5% for the ten items. A similar knowledge score was observed in the Qatar study (10). However, compared to the study by Shraim N Yet al(11), a low mean knowledge score was 5.91(±1.27) on generic drugs.

The present study showed that 45.3 % of pharmacists understood generic medicine, much less than observed with community pharmacists of Palestine (11). On the other hand, the study showed that 81% of community pharmacists were aware of generic and branded drugs as bioequivalent, similar to the results observed in the Saudi study(9). Furthermore, community pharmacists (88.6%) know that generic and branded medicines are therapeutically equivalent, higher than Shraim N Y et al.(11). Almost 85% and 87 % of this study participants understand that generics are similar to brands in treating diseases and drug safety profiles, respectively, which were similar to the results of the Palestinian study(11). In the present study, 86.8% of community pharmacists were aware that the active ingredient of the generic is structurally similar to the brand. The percentage was lower than the Belay YB et al. (8) study (76.1 %).

The present study indicated that the community pharmacists of North Al Batinah had a positive attitude towards generic drugs and their substitution. The mean agreement for the attitudes regarding generic drugs was 73.37%. The findings were higher compared to the studies done in Saudi Arabia (59.35%) and Qatar (61.7%).

The present study showed that 54.7% of the pharmacist agreed that wider use of generics would reduce the amount of money spent on the development of new drugs, which was lower in comparison to the studies by Shraim N Y et al. (70%) and Awaisu A et al. (71.2%) (11). Furthermore, the community pharmacists (77.3%) of this study supported generic substitution when available in their pharmacies. In comparison, the findings were lower in the Qatar study (72.2%) and the Palestine study (62.2%); it was lower (11).

Community pharmacists (92.4%) of this study agreed that they would issue generic substitution, especially for patients who cannot afford the price of branded drugs. These findings were much higher compared to the studies done in Qatar (86.1), Palestine (64%), and Ethiopia (60%) (8, 11).

In the present study (88.7%) of the community, pharmacists agreed that patients should have enough explanations about why they choose generic medicines. On the contrary, the findings of the Palestine study were lower (81.4%) (11).

A low percentage (34%) of the participants in the current study agreed that when performing the generic substitution, community pharmacists prescribing physicians must be consulted. Similar findings were observed in the Ethiopian study (8).

Almost 70% of the community pharmacist in the present study agreed to distribute generic drugs to their patients, which was lower compared to the study results of Qatar (80.5%) and Palestine (86%) (10, 11). Furthermore, the present study exhibited that (75.5%) of community pharmacists should have generic substitution rights, while a

higher percentage of the pharmacists agreed in the Palestine study and Qatar study (10, 11).

The (77.3%) community pharmacists of the present study agreed that the distribution of generics was greatly influenced by the intensity of promotional activities done by medical representatives, which was similar to the findings observed in the study by Awaisu et al. (10).

The present study evaluated the perception of community pharmacists of generic drugs. The survey analysis showed that the majority (84.9%) of the pharmacists opined that the quality use of generic medicines among Omani consumers could be achieved if physicians and pharmacists worked together. A similar finding was observed in a Saudi study; in the present study (79.2%), community pharmacists recommend a standard guideline on the brand substitution process for community pharmacists in Oman, similar to the findings of the Saudi study (9). About (64.1%) of the pharmacists opined that the advertisements made by the drug companies would influence the distribution of branded drugs, which was similar to the results observed in the Saudi study (9). A similar percentage (64%) of the pharmacists in the present study indicated that the demand for the medicine would influence its dispensing, and the credibility of the generic medicine manufacturer is a concern when stocking drugs in the pharmacy. Compared to the Ethiopian study (8), the credibility factor influencing the dispensing was much lower(33.7%). On the other hand, (61.1%) of Saudi Arabian community pharmacists opined that the credibility of the generic drug manufacturers is a concern when stocking medicines in the pharmacy, and (60.6%) indicated that patients' demand for the medicine would influence dispensing it (9). More than three-fourths (79.2%) of the pharmacists in the current study opined that the bonuses and incentives offered by pharmaceutical companies on their products would influence the choice of drug selection, while compared to the study done by Wajid S et al. only (59.1%) of the pharmacists agreed, which is highly lower (9).

More than three-quarters (83%) of the pharmacists in North Al Batinah indicated that they would recommend to their patients an alternative to a branded medicine, similar to the study findings of Al Husseini M et al. (13). In this study (88.6%) of the pharmacists reported that they will never try to change their minds to take the brands if they are satisfied with generics, but compared to Kuwaiti pharmacists (62.2%), it was much higher (13). The present study shows that nearly half of the community pharmacists preferred to stock and dispense generic medications due to the good bonus scheme offered by pharmaceutical companies. The findings were higher than those observed in the Ethiopian study (8) (22.3%). A high percent (81.1%) of the pharmacist in this study reported shifting the patient complaining about generics to the brands with referral to a doctor. In the Al Husseini M et al. [11] study, the percentage was much lower (34.4%).

Limitations of the study

The study was conducted on a small sample as the aimed sample size was not achieved; therefore, the results could not be generalized. Furthermore, the study did not assess the knowledge of pharmacokinetic parameters and regulatory aspects of generic medicines.

CONCLUSION

The present study showed that many North Al Batinah Governorate community

pharmacists had basic knowledge about generic medicines. Pharmacists showed a positive attitude towards generic drugs and highly supported generic substitution. Reasonably, a high percentage of pharmacists indicated that bonuses, incentives, patient demand for the medicine, and manufacturer credibility were the key factors that persuaded their stock and dispensing of generic drugs in the community pharmacies. The study recommends educational intervention/continuing education training programs to improve generic medicine dispensing practices among community pharmacists.

ETHICAL APPROVAL

The study was approved by the Graduation Project Committee, School of Pharmacy, University of Nizwa, and the Department of Pharmacy of Directorate General of Pharmaceutical Affairs and Drug Control, Ministry of Health, Muscat.

Participants were informed about the aim and objectives of the study, the procedure to complete the questionnaire, and the anonymity of the survey. Verbally consented pharmacists who met the inclusion criteria were distributed with a self-administration questionnaire. All completed questionnaires were collected and sealed in envelopes. The confidentiality of the collected data was ensured, and the collected data was used only for the present study.

AUTHOR'S CONTRIBUTION

Arwa: writing-original draft, data curation, formal analysis. **Sujith:** conceptualization, methodology, and supervision. **Ahmed Nouri:** validation, visualization, and writing review & editing.

COMPETING INTEREST

The authors have no competing interests to declare relevant to this article's content.

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