Patient Education and Counseling xxx (2019) xxx–xxx

Contents lists available at ScienceDirect

Patient Education and Counseling

journal homepage: www.elsevier.com/locate/pateducou

Short Communication

Impact of pharmacists' training on oral anticoagulant counseling: A randomized controlled trial

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ARTICLE INFO

Article history:
Received 27 February 2020
Received in revised form 1 September 2020
Accepted 4 September 2020

Keywords:
Oral anticoagulant
Warfarin
Pharmacist
Counseling
Mystery patient
Randomized control trial
Drug interactions
Adverse drug reaction

ABSTRACT

Objective: The study evaluated the impact of oral anticoagulant counseling training on the quality of counseling provided by pharmacists.
Methods: A prospective RCT was conducted among 33 pharmacists from 23 pharmacies in Ibadan, Nigeria. Six mystery patients (MPs) who were either warfarin-naïve, experienced adverse drug reaction (ADR), or drug interaction (DI) to warfarin were used to assess pharmacists' oral anticoagulant counseling quality at pre- and post-intervention. A 2-week online oral anticoagulant counseling training was given to the intervention group pharmacists. Quality of counseling was categorized as poor (0–20 %), fair (21–50 %), moderate (51–80 %), and optimal (81–100 %).
Results: At pre-intervention, the quality of oral anticoagulant counseling provided to the MPs was poor. Post-intervention, the quality improved among pharmacists in the intervention group, from poor to fair for both warfarin-naïve MP and MP who experienced DI, and from fair to moderate for MP with ADR.
Conclusion: Short-term online oral anticoagulant counseling training improved the quality of counseling provided by community pharmacists to mystery patients on warfarin.
Practice implication: Online oral anticoagulant counseling training may be employed by pharmacists' professional bodies intermittently to improve oral anticoagulant counseling.

1. Introduction

Oral anticoagulants are used to manage or prevent thromboembolic events [1] and warfarin was the mainstay anticoagulant therapy before the advent of direct oral anticoagulants (DOACs) [2]. Though, DOACs improved on the adverse drug reactions (ADRs) experienced with warfarin; warfarin is still used in resource-limited settings for patients with atrial fibrillation to prevent stroke [3,4] and complications in mechanical heart valve replacement [5]. The decision to place a patient on warfarin is informed by the consideration of risk-benefit analysis augmented with the evaluation of the patient's medical, medication, social, and dietary history [6].

Poor knowledge of warfarin use may partly be due to lack of proper counseling or poor patient understanding [7,8]. Counseling by pharmacists has led to decrease in morbidity- and mortality-related drug therapy by improving health outcomes and its surrogate endpoints in both acute and chronic diseases [9,10]. Methods used by pharmacists to counsel patients on oral anticoagulants have shown variable results in impact and effectiveness [11–13], but online training have been employed to improve pharmacists medication therapy management knowledge and health profession students skill and ability to counsel on smoking cessation [14,15]. Though, few positive impacts of pharmacists-led anticoagulant education have been described [13,16]. No direct measure of the quality of oral anticoagulant counseling has been reported to the best of our knowledge. Hence, the impact of short-term online oral anticoagulant counseling training for community pharmacists was evaluated using mystery patient model. This model is a widely used unbiased method of evaluating current pharmacy practice [17].

2. Methods

2.1. Ethics approval

The study was approved by the University of Ibadan/University College Ethics Committee (UI/EC/19/0133) and registered with ClinicalTrial.gov (NCT03999905). Written informed consent was obtained from each participant. The study was performed in accordance with the Declaration of Helsinki [18].

Abbreviations: MP, mystery patient; ADR, adverse drug reaction; DDI, drug-drug interaction; DOACs, direct oral anticoagulants; FGD, focus group discussion; MTM, medication therapy management.

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https://doi.org/10.1016/j.pec.2020.09.018
0738-3991/

2.2. Study protocol

The study was a double-blind prospective interventional randomized controlled trial, using mystery patient (MP) model, conducted from April to October 2019. It was carried out in Ibadan metropolis, Oyo state, Nigeria among community pharmacists. The study sample was determined as shown in Fig. 1.

Thirty-four pharmacies with their pharmacists were assigned equally to the control or intervention group via online computer-generated random numbers (Fig. 1) by two postgraduate students who were not part of the study. The grouping was blinded to the pharmacies/pharmacists, MPs, and the investigators.

2.2.1. Mystery patients

A mystery patient is trained to act like a real patient when making a product request or laying a medical complaint with a pharmacist. Six MPs (4 females and 2 males), trained by the authors through mock presentations for standardization to ensure inter-rater reliability, made impromptu visits to the pharmacies, asked to speak with the pharmacists only and enacted three designed scenarios outlined in Table 1 before and after the intervention. Participating pharmacies were visited once by three different MPs who took turn to complete their circles within 6 weeks. Four weeks post-intervention, similar procedure was repeated by three other MPs. The recorded conversations were transcribed and the counseling points mentioned by the pharmacists in each scenario were independently identified by the authors. Discrepancies were resolved through discussion.

Appropriate oral counseling for each MP scenario was determined by focus group discussion (FGD) members comprising of three Clinical Pharmacy lecturers and two community pharmacists. Eighty percent consensus was used to select the important counseling points that should be provided to each MP. These are outlined in Supplementary Table A.1. Based on the suggested scenario 1 counseling points, $WAR_2FA_2RI-NIS_2ED$ SP_2Y mnemonic was coined from the old WARFARI-NISED mnemonic [19] for counseling warfarin-naïve patients. A patient education book for patients on warfarin was developed by the authors as suggested by the FGD members to complement oral counseling.

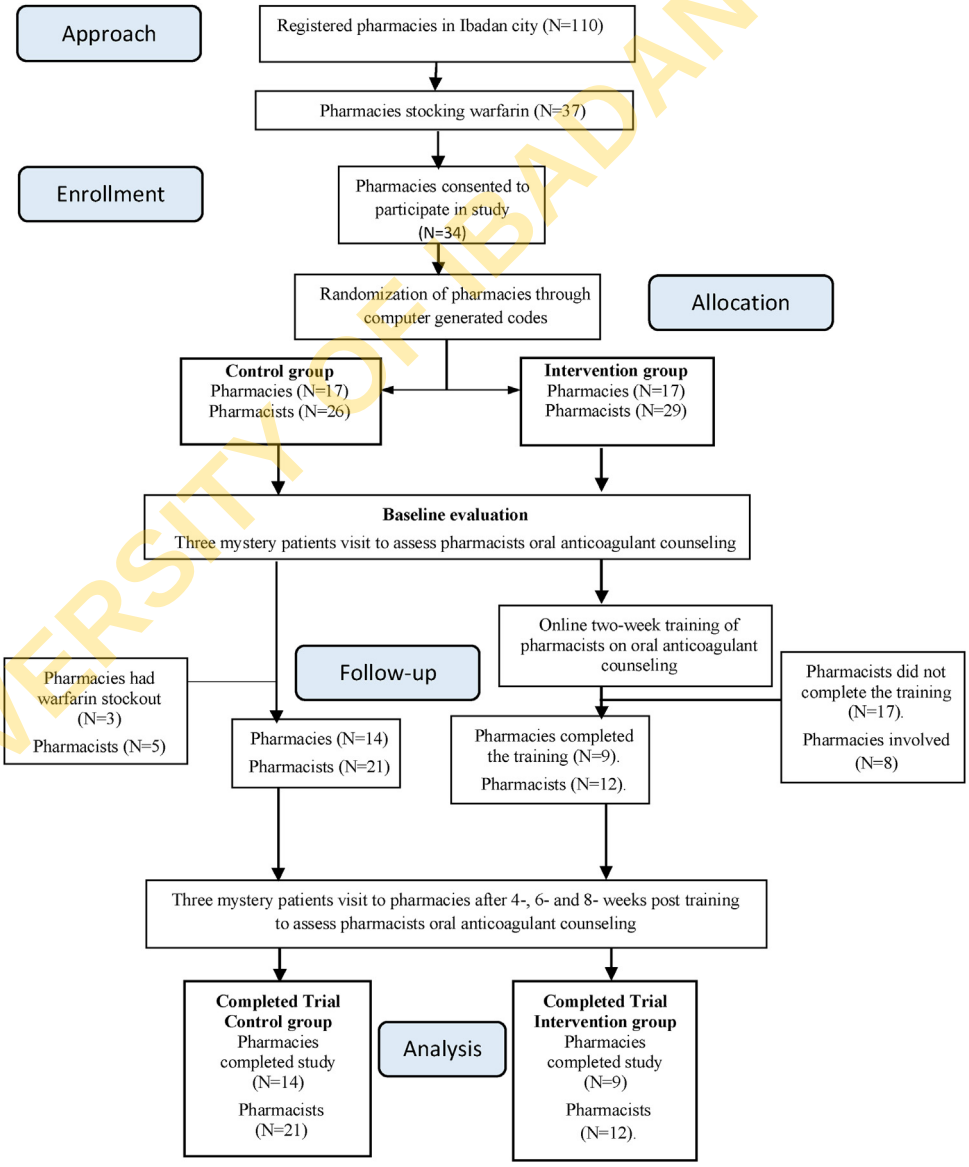

Fig. 1. CONSORT flow diagram for the study.

Please cite this article in press as: S.J. Showande, E.N. Orok, Impact of pharmacists' training on oral anticoagulant counseling: A randomized controlled trial, Patient Educ Couns (2020), https://doi.org/10.1016/j.pec.2020.09.018

Table 1
Descriptions of mystery patient scenarios.

Scenario 1: Description of Warfarin naïve mystery patient*
A female patient, 30 years old, visited the pharmacies with a prescription for Warfarin 5 mg daily for one month.
Additional information provided by the mystery patient when asked:
She identified that the prescription belonged to her. She has never taken warfarin before. The medication was prescribed for the blood clot in her lungs. She has had the symptoms of the blood clot for a while. The symptoms were chest pain, cough, and difficulty in breathing. The physician informed her that the oral contraceptive she used for two years (Combination 3®) may be responsible for the clot in her lungs. She no longer takes the oral contraceptive. She was not on any other medication.
Scenario 2: Description of mystery patient experiencing adverse drug reaction to warfarin*
A female patient, 35 years of age, complained to the pharmacist about passing black tarry stools and having unusually heavy menstruation for the past 7 days.
Additional information provided by the mystery patient when asked:
She did not have a burning sensation or cramps in her stomach. Experienced menstrual pain during her menstruations. Has not used ibuprofen, diclofenac, piroxicam, or other non-steroidal anti-inflammatory drugs (NSAIDs) for menstrual pain before and she was not using any. Used only paracetamol for her menstrual pain. Her menstruation usually lasts for 4–5 days. She had been bleeding for 7 days. No fever, no diarrhea, and no history of ulcer. No history of fibroid. She was taking warfarin and paracetamol. She had been on warfarin for one month and paracetamol for 3 days. She was taking warfarin for deep vein thrombosis (DVT). She had pain and swelling on her calf before she was diagnosed with DVT. She takes warfarin 5 mg daily at night and paracetamol 1 g twice daily.
Scenario 3: Description of mystery patient experiencing drug interaction with warfarin*
Adult male, 50 years, requested to see the pharmacist and complain of experiencing gum bleeding whenever he brushed his teeth, and sometimes his nose bleeds.
Additional information provided by the mystery patient when asked:
The bleeding started four days ago. He uses a medium-bristled toothbrush. He is taking warfarin 5 mg daily. Takes Ibuprofen 400 mg three times daily. He should voluntarily show the pharmacist a sachet each of warfarin and ibuprofen (containing few tablets). Warfarin was for his heart condition (Atrial Fibrillation) and Ibuprofen for waist pain. He had been on warfarin for two months and Ibuprofen for one week. His physician prescribed warfarin for him. He purchased Ibuprofen over the counter. He did not experience the bleeding before the intake of Ibuprofen. Has not done INR recently. However, he did that before warfarin was prescribed. He is a commercial vehicle driver and takes alcohol moderately. Thinks his heart condition has improved.

Combination 3® – (Levonorgestrel, Ethinyl estradiol, and Ferrous fumarate).
* Each scenario was played by two mystery patients of similar ages. One at pre-intervention and the other at the post-intervention.

2.2.2. The intervention

Pharmacists from the intervention group pharmacies participated in a 2-week online training on oral anticoagulant counseling module hosted on moodlecloud.com. The module as shown in Supplementary Table A.2. contain materials the participants were to read at leisure and answer multiple choice questions and practice with case studies. Pharmacists in the control group pharmacies also went through the same training after the trial. The pharmacists were not aware of their grouping but were duly informed prior to the commencement of the study that they will participate in an online training.

2.3. Data analysis

The data were analyzed with Statistical Package for Social Sciences Windows version 25 (IBM Corp, New York, USA) and presented as mean ± standard deviation, mean rank, frequency, and percentages. Counseling score was calculated by assigning 1 point for counseling point mentioned and 0 point for any missed counseling point. The counseling quality was determined as (100 x Average score obtained)/ Average score obtainable and further classified based on the FGD suggestions as: Poor – 0–20%; Fair - 21–50%; Moderate - 51–80% and Optimal 81–100%. Mann Whitney-U test was used to assess differences in pharmacists' counseling mean ranks between the control and intervention groups at pre- and post-intervention.

3. Results

Fig. 1 shows the number of pharmacists who completed the study while Table 2 displays the demographic characteristics of the pharmacists.

3.1. Warfarin-naïve MP

With the use of $WAR_2FA_2RINIS_2ED$ SP_2Y mnemonic more pharmacists in the intervention group compared with the control group counseled the warfarin-naïve MP more after the intervention on; side effects, duration of treatment, importance of keeping to the prescribed dose, not missing the physician appointments and all patients were given warfarin patient education book (Table 3). The quality of counseling improved in the intervention group from poor to fair (Table 3).

Table 2
Demographic characteristics of the community pharmacists in the study groups.

Demographics	Control group pharmacists (N = 21)	Intervention group pharmacists (N = 12)	P-value
Age, Mean ± SD (years)	29.38 ± 4.21	28.50 ± 3.21	0.536[a]
Gender n (%)			
Male	16 (76.19)	6 (50.00)	0.149[b]
Female	5 (23.81)	6 (50.00)	
Marital status n (%)			
Single	13 (61.91)	10 (83.33)	0.259[b]
Married	8 (38.09)	2 (16.67)	
Additional qualification (%)			
PharmD*	5 (23.81)	2 (9.09)	0.578[b]
MSc.	2 (9.52)	3 (13.64)	
None	14 (66.67)	7 (77.27)	
Years of community pharmacy experience, Mean ± SD (years)	3.19 ± 1.94	3.67 ± 3.14	0.593[a]

* PharmD – Doctor of Pharmacy is considered as additional qualification to the Bachelor of Pharmacy degree (B.Pharm) by some of the pharmacists who had undergone a specialized Pharm.D program, MSc – Master of Science, SD – standard deviation.
[a] Independent sample *t*-test.
[b] Fisher exact test or its Freeman-Halton extension.

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Table 3
Comparison of pre- and post-intervention oral anticoagulant counseling provided to warfarin naïve mystery patients by pharmacists.

Mnemonic	Counseling provided by the pharmacist	Pre-Intervention Mean Rank (n)		p-value*	Post-intervention Mean Rank (n)		p-value*
	The pharmacist told the patient:	Control (N = 14)	Intervention (N = 9)		Control (N = 14)	Intervention (N = 9)	
W	To take the drug regularly at the same time in the evening	11.82 (1)	12.28 (1)	0.747	10.79 (4)	13.89 (5)	0.206
A	To avoid taking or reduce alcohol intake while on this drug	12.00 (0)	12.00 (0)	1.000	11.32 (1)	13.06 (2)	0.305
R_2	That she may experience some form of adverse drug reactions such as gum bleeding, bruises, etc.	11.82 (1)	12.28 (1)	0.747	10.96 (3)	13.61 (4)	0.252
	What to do if she noticed such adverse reactions	11.50 (0)	12.78 (1)	0.212	10.32 (1)	14.61 (4)	**0.038**
F	Not to take warfarin with fruit juice.	12.00 (0)	12.00 (0)	1.000	11.82 (1)	12.28 (1)	0.747
A_2	To avoid exercises or activities that may lead to fall or injury while taking the drug.	12.00 (0)	12.00 (0)	1.000	10.82 (1)	13.83 (3)	0.114
	To do more aerobic exercises such as brisk walk.	12.00 (0)	12.00 (0)	1.000	12.00 (0)	12.00 (0)	1.000
	To avoid injectables while on warfarin.	12.00 (0)	12.00 (0)	1.000	12.32 (1)	11.50 (0)	0.423
R	The reason for taking the drug	11.79 (4)	12.33 (3)	0.813	9.32 (1)	16.17 (6)	**0.003**
I	The types of drugs that should not be taken with warfarin	12.14 (2)	11.78 (1)	0.829	10.96 (3)	13.61 (4)	0.252
	The types of food that should be avoided while on warfarin	12.00 (0)	12.00 (0)	1.000	11.50 (0)	12.78 (1)	0.212
	To minimize the quantity of vegetables consumed while on warfarin	11.50 (0)	12.78 (1)	0.212	11.00 (0)	13.56 (2)	0.071
	Not to take herbal medications while on warfarin	12.00 (0)	12.00 (0)	1.000	11.82 (1)	12.28 (1)	0.747
N	To inform every physician or healthcare personnel that she is taking warfarin	12.79 (4)	10.78 (1)	0.333	8.46 (3)	17.50 (9)	**0.000**
	Incidence of vomiting and diarrhea while on the drug should be reported to the physician.	12.00 (0)	12.00 (0)	1.000	11.50 (0)	12.78 (1)	0.212
I	The importance of INR tests	12.32 (1)	11.50 (0)	0.423	11.00 (0)	13.56 (2)	0.071
S_2	To take the drug as soon as she remembers in any event of a missed dose.	12.00 (0)	12.00 (0)	1.000	11.50 (0)	12.78 (1)	0.212
	Not to double the dose in any event of a missed dose.	12.00 (0)	12.00 (0)	1.000	11.32 (1)	13.06 (2)	0.305
	About the side effects associated with the drug such as easy bruising, nose bleeds, bleeding gum, severe headache, abdominal pain, nausea, diarrhea, fever, etc.	11.50 (0)	12.78 (1)	0.212	9.29 (4)	16.22 (8)	**0.006**
E	How long she is to take the drug.	12.18 (13)	11.72 (8)	0.747	10.39 (9)	14.50 (9)	**0.047**
D	How many times she is to take the drug daily according to the prescription.	12.00 (14)	12.00 (9)	1.000	10.71 (10)	14.00 (9)	0.084
	To keep to the prescribed dose.	12.96 (3)	10.50 (0)	0.145	10.32 (1)	14.61 (4)	**0.038**
S	To stop any contraceptives, she may be currently using.	12.00 (0)	12.00 (0)	1.000	12.00 (0)	12.00 (0)	1.000
P_2	To avoid getting pregnant while taking the drug or not to take if pregnant.	12.00 (0)	12.00 (0)	1.000	11.50 (0)	12.78 (1)	0.212
	To consider other forms of contraception compatible with her lifestyle.	12.00 (0)	12.00 (0)	1.000	12.00 (0)	12.00 (0)	1.000
	To keep to the physician's appointment and not default	12.32 (1)	11.50 (0)	0.423	10.00 (0)	15.11 (4)	**0.007**
Y	Go through the warfarin patient education book	12.00 (0)	12.00 (0)	1.000	8.00 (0)	18.22 (8)	**0.000**
	Pharmacist's counseling scores	12.86	10.67	0.431	7.93	18.33	**0.000**
	Counseling quality (%)	11.64 %	11.11 %		11.91 %	37.45 %	
	Counseling quality category	Poor	Poor		Poor	Fair	

Number of pharmacists who provided the counseling is in parenthesis (n), Counseling quality = (100 x Average score obtained)/A average score obtainable, Counseling quality classification: Poor – 0–20%; Fair - 21–50%; Moderate - 51–80% and Optimal.81–100%.

* P-value was obtained from Mann Whitney-U test. $P < 0.05$ was considered significant.

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Table 4
Comparison of pre- and post-intervention oral anticoagulant counseling provided by pharmacists to mystery patients who experienced adverse drug reaction to warfarin.

Counseling provided by the pharmacist	Pre-intervention Mean rank (n)		P-value*	Post-intervention Mean rank (n)		P-value*
	Control (N = 14)	Intervention (N = 9)		Control (N = 14)	Intervention (N = 9)	
Pharmacist asked the patient if she has a "warfarin patient education book".	12.00 (0)	12.00 (0)	1.000	12.00 (0)	13.06 (2)	0.305
Pharmacist gave the patient a copy of the "warfarin patient education book".	12.00 (0)	12.00 (0)	1.000	12.00 (0)	13.06 (2)	0.305
Pharmacist told the patient to stop taking warfarin immediately.	12.89 (9)	10.61 (4)	0.360	10.39 (9)	14.50 (9)	**0.047**
Pharmacist referred the patient to her physician.	11.57 (8)	12.67 (6)	0.655	11.36 (12)	13.00 (9)	0.246
Pharmacist told the patient that she is likely experiencing an adverse drug reaction to warfarin.	10.43 (6)	14.44 (7)	0.107	10.71 (10)	14.00 (9)	0.084
Pharmacist told the patient the reason she must stop taking warfarin.	12.61 (5)	11.06 (2)	0.502	9.11 (5)	16.50 (9)	**0.003**
Pharmacist told the patient that the physician may adjust the dose of warfarin after conducting an INR test.	12.00 (0)	12.00 (0)	1.000	11.46 (3)	12.83 (3)	0.535
Pharmacist's counseling score.	11.89	12.17	0.922	9.00	16.67	0.005
Counseling quality (%).	28.57 %	30.16 %		39.80 %	68.25 %	
Counseling quality category.	Fair	Fair		Fair	Moderate	

Number of pharmacists who provided the counseling is in parenthesis (n), Counseling quality = (100 x Average score obtained)/A average score obtainable, Counseling quality classification: Poor – 0–20%; Fair - 21–50%; Moderate - 51–80% and Optimal.81–100%.
* P-value was obtained from Mann Whitney-U test. $P < 0.05$ was considered significant.

Table 5
Comparison of pre- and post-intervention oral anticoagulant counseling provided by pharmacists to mystery patients who experienced drug interaction associated with warfarin use.

Counseling provided by the pharmacist Pharmacist told the MP:	Pre-intervention Mean Rank (n)		p-value*	Post-Intervention Mean Rank (n)		p-value*
	Control (N = 14)	Intervention (N = 9)		Control (N = 14)	Intervention (N = 9)	
That the bleeding was likely due to the coadministration of ibuprofen with warfarin.	13.61 (5)	9.50 (0)	**0.047**	10.43 (6)	14.44 (7)	0.107
To discontinue ibuprofen.	13.93 (6)	9.00 (0)	**0.025**	11.11 (5)	13.39 (5)	0.360
To see the physician for alternate drug for the pain.	12.32 (1)	11.50 (0)	0.423	12.96 (3)	10.50 (0)	0.145
The type of toothbrush to use.	11.82 (1)	12.28 (1)	0.747	11.64 (2)	12.56 (2)	0.632
Suggested the use of topical analgesics for the relief of the waist pain.	12.32 (1)	11.50 (0)	0.423	12.00 (0)	12.00 (0)	1.000
That as a driver, the patient should not drive for long distances without intermittent breaks to stretch his legs.	12.00 (0)	12.00 (0)	1.000	12.00 (0)	12.00 (0)	1.000
To maintain a consistent diet while on warfarin.	12.00 (0)	12.00 (0)	1.000	10.32 (1)	14.61 (4)	**0.038**
To avoid too many vegetables while on warfarin.	12.00 (0)	12.00 (0)	1.000	9.00 (0)	16.67 (6)	**0.001**
To avoid self-medication as certain drugs can interact with warfarin.	12.00 (0)	12.00 (0)	1.000	9.00 (0)	16.67 (6)	**0.001**
To abstain from alcohol or take moderately.	12.00 (0)	12.00 (0)	1.000	10.50 (0)	14.33 (3)	**0.023**
To avoid engaging in any form of activities that can cause injuries.	12.32 (1)	11.50 (0)	0.423	9.82 (1)	15.39 (5)	**0.012**
Pharmacist gave the patient the "warfarin patient education book"	12.00 (0)	12.00 (0)	1.000	9.00 (0)	16.67 (6)	**0.001**
To always carry a warfarin card and show it to any health professional in charge of patient care.	12.00 (0)	12.00 (0)	1.000	12.00 (0)	12.00 (0)	1.000
Pharmacist's counseling scores	14.25	8.50	**0.023**	8.64	17.22	**0.002**
Counseling quality (%)	8.24 %	0.86 %		9.89 %	37.61 %	
Counseling quality category	Poor	Poor		Poor	Fair	

Number of pharmacists who provided the counseling is in parenthesis (n), Counseling quality = (100 x Average score obtained)/A average score obtainable, Counseling quality classification: Poor – 0–20%; Fair - 21–50%; Moderate - 51–80% and Optimal.81–100%.
* P-value was obtained from Mann Whitney-U test. $P < 0.05$ was considered significant.

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3.2. MP with ADR to warfarin

Post-intervention, pharmacists in the intervention group counseled the MP who experienced ADR to warfarin better than the control group; to stop taking warfarin and informed the MP of the reason as shown in Table 4. Pharmacists in both groups referred the MP to the physician equally. The quality of counseling given to the MP was fair in both groups at pre-intervention but was moderate in the intervention group, post-intervention (control = Fair – 39.8 %; intervention = Moderate - 68.3 %).

3.3. MP who experienced DDI

Table 5 shows that after the intervention, more pharmacists in the intervention group than the control group provided counseling to the MP who experienced drug-drug interaction (DDI) with warfarin. These pharmacists counseled the MP on diet, self-medication, moderate intake of alcohol, avoiding injury-prone physical activities, and provided a "warfarin patient education book" to the MP. At post-intervention, the quality of counseling provided by the pharmacists was poor and moderate in the control and intervention groups, respectively (Table 5).

4. Discussion and conclusion

4.1. Discussion

Generally, the 2-week online oral anticoagulant training improved the counseling offered to the three MPs in the intervention group. Most of the oral counseling offered centered on effective drug use and precautions to take. Written counseling was also improved by given "warfarin patient education book" to the MPs.

Poor quality of counseling provided by pharmacists in the control and intervention groups pre-intervention could translate to poor patient knowledge which may impact negatively on oral anticoagulant therapeutic outcomes [20]. This background poor quality of counseling showed a clear need for oral anticoagulant counseling training for these pharmacists. However, there was post-intervention improvement in the quality of counseling provided by pharmacists in the intervention group. This ranged from 37 % to 68 % for the three MPs. These values could be compared with the 63 % reported by Svarstad et al. [21] but higher when compared with the 27 % reported by Flynn et al. [22]. Differences in reported counseling qualities might be due to the study settings and methods of measuring counseling quality. This study used professional FGD-defined criteria while Flynn et al. [22] used the Omnibus Budget Reconciliation Act of 1990 defined counseling criteria.

Warfarin-naïve MP received counseling with the aid of the $WAR_2FA_2RINIS_2ED\ SP_2Y$ mnemonic on the indication, duration of use, side effect, what to do when ADR is experienced, keeping to prescribed dose and physicians appointments. This is similar to Okumura et al. [23] systematic review findings where pharmacists counseling focused on correct indication, side effects, ADR, and drug interactions. Yet in another study patients were unaware of the dose, indication, and DDI with warfarin [24]. Patients unaware of the reason for using oral anticoagulants are likely to be nonadherent, stop the medication, experience more side effects, ADRs, and complications as a result of poor or insufficient counseling [21,22]. These can be curbed when the pharmacists are adequately trained to provide adequate counseling to patients on warfarin.

Pharmacists in the intervention group recognized that the second MP was experiencing ADR to warfarin and told her why she must stop warfarin and see her physician immediately. Likewise, the MP who experienced DDI was counseled to avoid inappropriate self-medication. The online training improved the counseling offered to patients experiencing ADR and DDI due to warfarin. This is corroborated by other reports where online training has been shown to improve: pharmacists' knowledge and performance of medication therapy management (MTM) for diabetic patients [14], pharmacy staff knowledge and practice on hypertension MTM management [25], and pharmacy students' counseling ability on smoking cessation [15].

Pharmacists in the intervention group were unable to give comprehensive counseling to the three MPs perhaps because of the brevity of time. They, however, complemented it with the provision of "warfarin patient education book". Combined oral and written counseling has been shown to have greater impact on the quality of counseling than either alone [22].

One of the limitations of the study is the short training period which accounted for the substantial loss to follow-up of the pharmacists. Also, the small sample size of the study may limit the generalizability of the findings.

4.2. Conclusion

The short-term online oral anticoagulant counseling training for pharmacists improved the quality of counseling offered to diverse mystery patients on warfarin.

4.3. Practice implications

Online oral anticoagulant counseling training may be employed by pharmacists' professional bodies intermittently to improve oral anticoagulant counseling among community pharmacists.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

CRediT authorship contribution statement

Segun J. Showande: Conceptualization, Formal analysis, Investigation, Methodology, Resources, Visualization, Supervision, Writing - original draft, Writing - review & editing. **Edidiong N. Orok:** Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Software, Writing - review & editing.

Declaration of Competing Interest

The authors report no declarations of interest.

Acknowledgment

The authors thank all the pharmacies and pharmacists that took part in the study.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.pec.2020.09.018.

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Please cite this article in press as: S.J. Showande, E.N. Orok, Impact of pharmacists' training on oral anticoagulant counseling: A randomized controlled trial, Patient Educ Couns (2020), https://doi.org/10.1016/j.pec.2020.09.018