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Self-care goals proposition and achievement by patients undergoing oral anticoagulation during an educational intervention based on empowerment

Mayara Oliveira ORTIZ[1], Josiane Moreira da COSTA[2], Daniella Vieira NASCIMENTO[2], Carolina Barbosa FERREIRA[2], Thais Roberta CORREIA[2], Caryne Margotto BERTOLLO[2], Maria Auxiliadora MARTINS[2]

[1]Hospital Sofia Feldman - Minas Gerais, [2]Universidade Federal de Minas Gerais - Minas Gerais

Corresponding author: Ortiz MO, mayara.ortiz@hotmail.com

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Abstract

Objective: To identify self-care goals proposition and achievement established by patients using warfarin during an educational intervention based on health empowerment in a middle-income country. **Methods**: Descriptive study with 103 patients of a Teaching Hospital anticoagulation clinic (AC) located in Minas Gerais. The inclusion criteria were age ≥ 18 years, both sexes, use of warfarin > 6 months, diagnosis of valvular or non-valvular atrial fibrillation (AF), attended to the AC between july and december 2018, low quality oral anticoagulation and participation in the first and/or second circle of culture (CC) of the educational intervention (IE). The exclusion criteria were impossibility of verbal communication, deafness, blindness or health problems that could compromise attendance at the AC. The proposition of goals took place between april and july 2019 during the IE which was composed by four monthly CC with different subjects. Between them, telefone contacts were done using a Behavior Change Protocol validated in Brazil. Sociodemographic variables, general and specific goals and its achievement were considered and the correlation between the number of patients who participated in each CC and biological sex was performed. Descriptive statistical analysis was performed. **Results**: Patients had a mean age of 64.2 (SD 12.7) years, with a predominance of females (71; 69.6%). Considering the 33 patients who proposed general goals, 60.6% (20) achieved and 80.7% (67) of the 83 patients who answered the phone achieved the specific goals. The most accomplished specific goals (37; 74,0%;) were those about food rich in vitamin K consumption, mentioned a total of 50 times, and the most accomplished general goal (3; 75,0%) referred to other self-care practices, mentioned a total of 4 times. The specific goal that had the highest percentage of non-compliance (60,0%; 6) was related to physical activity, mentioned a total of 10 times, with a statistically significant p value (0.001). **Conclusion**: The results suggest that educational interventions can contribute to the identification and achievement of self-care goals in patients using warfarin and more robust studies are recommended.

Key words: warfarin; self care; decision making, shared; health literacy; patient participation; patient education as topic.

Proposição e cumprimento de metas de autocuidado por pacientes em anticoagulação oral durante uma intervenção educacional baseada no empoderamento

Resumo

Objetivo: Identificar proposição e cumprimento de metas de autocuidado gerais e específicas relacionadas ao tratamento anticoagulante estabelecidas por pacientes em uso de varfarina durante uma intervenção educacional pautada no empoderamento em saúde em um país de média renda. **Métodos:** Estudo descritivo realizado com 103 pacientes atendidos em uma clínica de anticoagulação (CA) de Minas Gerais. Critérios de inclusão: idade ≥ 18 anos, ambos os sexos, uso de varfarina > 6 meses, diagnóstico de fibrilação atrial valvar ou não valvar, atendimento na CA entre julho a dezembro de 2018, baixa qualidade na anticoagulação oral e participação no primeiro e/ou segundo círculo de cultura (CC) da intervenção educacional (IE). Critérios de exclusão: impossibilidade de comunicação verbal, surdez, cegueira ou problema de saúde que comprometesse o comparecimento à CA. A proposição de metas ocorreu entre abril e julho de 2019, durante a IE, a qual foi composta por quatro CC mensais com diferentes temáticas. No intervalo entre eles, realizou-se interação mediada por telefone utilizando-se o Protocolo de Mudança de Comportamento. Foram consideradas as variáveis sociodemográficas, metas gerais e específicas propostas e relato de cumprimento das mesmas. Realizou-se a correlação entre o número de pacientes que participaram de cada CC e sexo biológico e análise estatística descritiva. **Resultados:** Os pacientes apresentaram média de idade de 64,2 (DP 12,7) anos, com predominância do sexo feminino (71; 69,6%;). Dos 33 pacientes que propuseram metas gerais, 60,6% (20) cumpriram e 80,7% (67) dos 83 pacientes que atenderam ao telefone cumpriram as metas específicas. As metas específicas mais cumpridas (37; 74,0%;) foram aquelas relacionadas à alimentação, mencionada em um total de 50 vezes, enquanto a meta geral mais realizada (3; 75,0%) se referiu às demais práticas de autocuidado, mencionada em um total de 4 vezes. A meta específica que teve maior porcentagem de não cumprimento (60,0%; 6) foi a relacionada à atividade física, mencionada em um total de 10 vezes, com valor de p estatisticamente significativo (0,001). **Conclusão:** Intervenções educativas podem contribuir para a identificação e cumprimento de metas em pacientes utilizando varfarina, sendo recomendada a realização de estudos mais robustos.

Palavras-chave: varfarina; autocuidado; tomada de decisão compartilhada; letramento em saúde; empoderamento para saúde.

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Introduction

By identifying the need for improvement in the practices of providing health care related to the use of medications, in 2017, the World Health Organization (WHO) launched the 3rd Global Patient Safety Challenge with the theme of "Medication without Harms". The intention is to achieve a 50% reduction of the severe and avoidable harms related to administration and use of medications by 2022.[1]

In this context, the WHO recommended concentration of efforts, among other areas, in those related to offering greater knowledge input to patients, family members and caregivers, so that they become the center of the care process.[2,3] The patient's active participation in the treatment becomes even more important when considering the so-called potentially dangerous medications (PDMs), as any failure in their use can result in serious consequences, such as permanent injuries or death.[4]

Among the PDMs, warfarin stands out, an anticoagulant used worldwide for the prevention of thromboembolic events, highlighting ischemic stroke.[5] Despite the benefits, effectiveness and safety of the warfarin treatment are influenced by multiple factors, such as diet, genetic polymorphisms, comorbidities and cognitive aspects, among others.[5,6] Thromboembolic and hemorrhagic events stand out as undesirable events of inadequate anticoagulation, with hemorrhagic stroke standing out.[7]

Effectiveness and safety of oral anticoagulation is monitored through the International Normalized Ratio (INR) test, and quality of the treatment is monitored by the time in therapeutic range (TTR), calculated based on a linear interpolation from different INR values.[8]

A number of studies point to the existence of gaps and limitations of evidence in relation to the impact of educational strategies aimed at patients in use of oral anticoagulation. Among these, the exclusion of patients with cognitive impairment and older adults with inadequate functional literacy stands out, characteristics common to patients undergoing oral anticoagulation in middle-income countries.[9-11] It is understood that patients with these characteristics could benefit from educational actions that encourage understanding about the treatment and contribute to shared decision-making.[12-14]

In recent years, there has been a strengthening of health educational practices with a focus on empowerment, consisting in the development of patients' autonomy regarding decision-making.[15] Some of these practices are based on the establishment of self-care goals in health and, despite the benefits of these actions for patients with diabetes, experiences of establishing self-care goals by patients in use of warfarin are still scarce in the literature.[8,15,16] Thus, it is interesting to understand how the establishment and achievement of self-care goals by patients undergoing oral anticoagulation takes place in a real-world context.

The objective of this study was to identify the proposal and achievement of general and specific self-care goals related to the anticoagulant treatment, established by patients in use of warfarin during an educational intervention based on health empowerment in a middle-income country.

Methods

A cross-sectional study developed in an Anticoagulation Clinic (AC) located in a public teaching hospital from Minas Gerais. The AC provides multiprofessional assistance to cardiac patients since 2009. During the assistance provided, the patients are approached regarding lifestyle and eating habits, medications in use and adherence to warfarin, information that guides adjustments in pharmacotherapy and scheduling of returns.

This study was an excerpt from a controlled clinical trial carried out between April 2019 and August 2020, in which proposal of goals took place between April and July 2019, with publication of the study protocol in 2019. The educational intervention consisted in approaching a group of three to fifteen participants with a female pharmacist in the role of mediator. For each patient, four face-to-face meetings with a mean duration of one hour were offered monthly, called Culture Circles (CCs), as proposed by Freire.[17,18] The CCs consisted of warm-up moments, stimulus to critical thinking and conclusion, each one with a central theme, as follows: 1) self-care in health; 2) knowing the health problem and the reason for anticoagulation; 3) interaction of warfarin with medications/self-medication; and 4) interaction of warfarin with food.[19-23]

The intervention was directed to patients with low quality of oral anticoagulation and, during the CCs, educational material and techniques were used aimed at patients with low literacy, namely: feedback technique; life-size doll simulating a patient; macro-size medication boxes and pictures that represented the participants' everyday issues.[23]

In the interval between the CCs, interactions were carried out mediated by telephone with the patients who participated in the first and/or second CC, in order to contribute to fixation of learning and to encourage self-care actions in health. For this purpose, recommendations from the Behavior Change Protocol (BCP) for patients undergoing oral anticoagulation were used, validated in Brazil by the same research group.[23]

In order to contribute to establishing a general goal for self-care in health, the following open questions were asked in the phone calls: 1) "What are you doing to take better care of yourself?", formulated after the first CC; and 2) "What have you done or will do to take better care of yourself?", formulated after the second CC. The answers to both questions were compared in order to verify maintenance/persistence and achievement of the general self-care goals. In addition to that, those who did not propose any general self-care goal in health during application of the first question had a new opportunity to establish it when answering the second.

In the telephone-mediated interaction held after the second CC, they were asked about a specific self-care goal related to the anticoagulation treatment through the following open question: "What will you do to improve the treatment?". After the third CC (one month after the second CC), the participants were dichotomously asked whether or not they continued to achieve the specific goal proposed in the previous phone call. It is noted that no maximum number of goals to be proposed by each patient was stipulated. The patients' reports that exemplified the goals were recorded and subsequently coded according to the type of goal.

The inclusion criteria were as follows: age ≥ 18 years old, both genders, using warfarin for at least six months, valvular or non-valvular atrial fibrillation, treated at the AC under study from July to December 2018, low TTR (<60%) during this period, and

participation in the first and/or second CC of the educational intervention. The exclusion criteria were the following: impossibility of verbal communication, deafness, blindness or health problem that compromised attendance to the clinic. Cognitive impairment was not considered as an exclusion criteria.

The patients who did not answer the phone contacts were considered as losses, representing failure in the effective implementation of the telephone-mediated interaction. For the cases in which there was at least one phone contact, the other absent data were considered as missings.

The following variables were considered: gender and age in years old, total number of patients who participated in the first and second CC, general self-care goals in health and specific anticoagulation treatment goals, as well as reporting of their achievement. Gender and age were collected by consulting the electronic medical records in the institution's computerized system and by checking the record in the physical chart, with the other variables being identified in a computerized spreadsheet used to record the phone calls. This same spreadsheet was used to record the patients' attendance or non-attendance to each CC, after checking the attendance lists. The reports' records were also considered to exemplify establishment and achievement of the goals, as well as for their categorization. The variables were coded in a Microsoft Excel® spreadsheet, with descriptive analysis performed in the *Statistical Package for Social Sciences*® (SPSS) software, version 25.0 (2017. Armonk, NY: IBM Corp.). The data were subdivided according to the achievement of goals and a statistically significant difference was identified between the groups by using Pearson's chi-square test for the categorical variables. A p-value<0.05 was considered as the statistical significance parameter.

All patients were approached by a single researcher who was previously trained; the telephone-mediated interactions were carried out by a different person from the one who conducted the CCs, in addition to the fact that the CC moderator had no contact with the answers provided through the phone calls. In addition, the patients were coded in the computerized spreadsheet used to record the data collected, and questions recommended by the BCP were used.

This study is part of the project entitled "Implementation of an educational intervention in patients with inadequate control of oral anticoagulation with a vitamin K antagonist treated in two teaching hospitals", developed at the Federal University of Minas Gerais and approved by the Ethics Committee under CAAE opinion number 65928316.3.0000.5149. The minimum sample size (72 participants) was defined according to the analysis criteria required to conduct the aforementioned clinical trial. As the outcome of this study differs from the main study for which the sample size was calculated, the present sample (103 patients) is considered as of the convenience type.

All the participants were advised about the ethical aspects related to the study and signed the Free and Informed Consent Form (FICF).

Results

A total of 103 patients were included in the study, with 1 patient (1.0%) being characterized as a loss. The mean age was 64.2 years old (SD=12.7) and there was predominance of the female gender (69.6%; 71). Of the four culture circles conducted during the intervention, the patients were present in a mean of 2.4 CCs (SD=1.1), the first CC presenting a higher percentage (74.5%; 76) when compared to the second (72.5%; 74). It is noted that 29 (28.4%) and 27 (26.5%) patients took part exclusively in CC 1 and in CC 2, respectively, and that 47 (46.1%) participated in both CCs.

Regarding the general goal of self-care in health, 52 patients (51.0%) answered the question "What are you doing to take better care of yourself?", asked after the first CC. Of these, 33 (63.5%) established goals, and practice of physical activity was mentioned 22 times (66.6%), for example: "I'm always doing many things on the street, on foot" (sic); "I resumed walking" (sic). Most of the patients established more than one general goal and 36.5% (19) chose not to propose general goals in this approach. There was no success in this phone contact with 51 (49.5%) patients.

In relation to the question "What have you done or will do take better care of yourself?" (after the second CC), successful contacts were made with 102 (100%) patients. Of these, 92 (90.2%) reported general goals, which revealed predominance of the activities aimed at leisure (54.4%; 50), for example: "I like to listen to some music at home and dance" (sic); "I'm taking more care of the plants" (sic), followed by practice of physical activity (37.0%; 34). 10.7% (10) of the study participants chose not to report general goals in this approach.

Most of the 29 patients who chose not to report general goals regarding the questions "What are you doing to take better care of yourself?" and "What have you done or will do to take better care of yourself?" (72.4%; 21) had no reason to establish any general goal, and 13.8% (4) reported the presence of a painful sensation. 6 patients (5.8%) did not define general goals in any phone approaches.

Of the patients who defined a general goal after the first CC, 69.7% (23) maintained it and 60.6% (20) reported having achieved it, as shown in Table 2. The general goal most achieved (75.0%; 3) was related to other self-care practices, mentioned a total of 4 times, for example "I'm focusing on self-esteem" (sic); "I asked my children to help me with the house chores" (sic). The general goal with the highest non-achievement percentage (44,4%; 4) was the one regarding diet, mentioned a total of 9 times.

Table 1. Sociodemographic information and goals.

Information	**All** N=102	**Self-care goal proposal**[1]		**Goal achievement**[1,2]	
		First CC N=33	**Second CC** N=92	**Yes** N=84	**No** N=14
Female gender n (%)	71 (69.6)	24 (72.7)	63 (68.5)	58 (69.0)	10 (71.4)
Male gender n (%)	31 (30.4)	9 (27.3)	29 (31.5)	26 (31.0)	4 (28.6)
Age (years old) Mean (SD)	64.2 (12.7)	62.8 (12.8)	64.5 (13)	64 (13.0)	65.4 (11.0)
Number of goals Mean (SD)	3.0 (1.4)	1.2 (0.4)	2.7 (1.0)	-	-

[1]There was missing of data collected though telephone contact. [2]Data presented based on achievement of the general or specific goal.

In relation to the specific goal in self-care related to the anticoagulation treatment, 102 (100%) patients answered the question "What will you do to improve the treatment?" after the second CC and 101 (99.0%) patients established goals. The most reported goal (73.3%; 74) was related to good periodicity of the treatment (Table 2), for example: "I'm going to take the medication to the *forró* dance class so I don't miss the time" (sic); "I'll be careful with the anti-inflammatories" (sic). In this aspect, it includes administering warfarin at the correct time and dosage, paying attention to self-medication, not forgetting or doubling any dose, observing bleeding signs and symptoms and/or informing changes in pharmacotherapy. It is noted that 1 (1.0%) participant chose not to define specific goals.

In the telephone-mediated interaction conducted one month after the last, 83 (82.2%) of the 101 patients who proposed specific goals answered the question "Are you still carrying out the same change proposed in the last CC?". Of these, 67 (80.7%) reported having attained the specific goal. Of the 16 (19.3%) patients who reported non-compliance, 31.3% (5) did not have any reason to do so, while the same percentage reported discouragement, followed by a sensation of discomfort (25.0%; 4). There was no success in this phone contact with 18 (17.8%) patients who proposed specific goals.

When compiling the target data identified with the question "What will you do to improve the treatment?" and its achievement (questiwon "Are you still carrying out the same change proposed in the last CC?"), it was shown that the most achieved goal (74.0%; 37) referred by patients was adequate eating habits, that is, intake of constant vitamin K sources (mentioned a total of 50 times), for example "I'll be careful when I make avocado smoothie" (sic); "I'm going to balance intake of green leaves" (sic). The specific goal that had the highest percentage of non-compliance (60.0%; 6) was related to physical activity (mentioned 10 times in total), with a statistically significant p-value (0.001).

Table 2 Definition of general and specific goals by the patients.

Information	All[1]	Self-care goal proposal[1]		Goal achievement[1]		
		First CC	Second CC	Yes	No	p-value
General goal	**N=102**	**N=52**	**N=102**	**N=33**	**N=33**	**-**
General goal of self-care in health n (%)	90 (88.2)	33 (63.5)	92 (90.2)	20 (60.6)	13 (39.4)	NA
Practicing physical activity	42 (46.7)	22 (66.6)	34 (37.0)	13 (59)	9 (41.0)	0.801
Studying again	1 (1.1)	1 (3.0)	1 (1.1)	1 (100)	-	0.413
Eating well	21 (23.3)	9 (27.3)	14 (15.2)	5 (55.6)	4 (44.4)	0.716
Leisure	50 (55.6)	3 (9.0)	50 (54.4)	2 (66.7)	1 (33.3)	0.822
Presenting good assiduity in the treatment	4 (4.4)	-	4 (4.5)	-	-	NA
Coming back to the next CC	1 (1.1)	-	1 (1.1)	-	-	NA
Other self-care practices	18 (20.0)	4 (12.1)	17 (18.5)	3 (75.0)	1 (25.0)	0.530
Specific goal	**N=102**	**NA**	**N=102**	**N=83**	**N=83**	
Specific goal related to the anticoagulation treatment n (%)	101 (99.0)	NA	101 (99.0)	67 (80.7)	16 (19.3)	NA
Practicing physical activity	10 (9.9)	NA	10 (9.9)	4 (40.0)	6 (60.0)	0.001
Presenting good assiduity in the treatment	74 (73.3)	NA	74 (73.3)	49 (66.2)	11 (14.9)	0.656
Eating well	50 (49.5)	NA	50 (49.5)	37 (74.0)	7 (14.0)	0.376
Leisure	8 (7.9)	NA	8 (7.9)	3 (37.5)	2 (25.0)	0.233
Other self-care practices	9 (8.9)	NA	9 (8.9)	6 (66.7)	2 (22.2)	0.680

[1]There was missing of data collected though telephone contact.

Discussion

In relation to the general goals in self-care, these proposals showed consonance with the concept of self-care maintenance, monitoring and management, already defined by the literature, which can reduce mortality rates and incidence of thromboembolism in warfarin users, as well as stimulate better health habits.[24-26] Among the general goals, the most reported ones after the first CC were related to the practice of physical activity (22; 66.6%), also consistent with the result found in an educational intervention based on the sociocognitive theory.[26]

Physical exercise is closely linked to the prevention of several comorbidities, mainly cardiovascular, which can corroborate the concomitant use of various medications. Polypharmacy is directly associated with higher risk of severe bleeding in patients undergoing anticoagulation with warfarin.[6] Probably, this goal stood out among the others due to the relation with the process of maintaining autonomy and physical well-being of older adults with heart failure, as already pointed out in the literature.[24]

Of the patients who established general goals of self-care in health, 60.6% (20) achieved them, which suggests that the intervention corroborated to a sufficient degree of health awareness to encourage changes in habits and lifestyle, something that knowledge itself is not able to do.[27] The general goal most achieved regarding the other self-care practices (75.0%; 3) is consistent with the fact already pointed out in the literature: patients undergoing anticoagulation seek a lifestyle that is in line with the ability to manage their own health condition.[25]

However, 39.4% (13) of the participants reported a different general goal from the initial proposal, which can be related to the purpose of fixing the lessons learned that the telephone-mediated interactions had in relation to the CCs, and not to maintain the general goal. In addition, it is known that behavior changes have the characteristic of evolving according to the patients' practice and experience time in managing self-care.[24]

Regarding the specific goal related to the anticoagulation treatment, the achievement percentage (80.7%; 67) can be

compared, in this same aspect, to the achievement result (75.6%) of a study that used the same BCP. Therefore, the result denotes the assistance provided to the users in making decisions that are necessary for the development of self-care behaviors and the notoriety of professional support and aid to the patients during this trajectory, consistent with what is suggested by other studies.[15,28-30]

A literature review also supports the argument that empowered patients engage more in the development of healthy behaviors.[31] For this purpose, Freire's methodology can provide critical thinking and awareness about the health problem and the importance of its treatment, necessary in the context in which many individuals with atrial fibrillation do not detain them, according to the literature.[27,32,33] This occurs from the moment when the understanding of the social reality itself takes place, which can be translated into the creation of strategies for change and shared decision.[23,29]

A number of studies have shown that a facilitating environment for sharing patients' experiences, doubts and insecurities is fundamental to conduct health education actions.[33-35] Thus, within the group, a relationship of exchange capable of constructing collective knowledge and materializing into a movement changing the reality with consequent generation of various forms of health care by the emancipated agent is established, capable of proposing and giving an opinion on decisions in the action-reflection-action process, as proposed by Paulo Freire.[29]

The specific goal most mentioned by the patients (73.3%; 74) was in relation to assiduity of the treatment, probably due to the lifestyle limitations imposed by the warfarin treatment and to the complexity of the dosage regimen. In this sense, the educational intervention may have contributed to warning about the importance of adhering to pharmacotherapy and the development of self-care management strategies when sharing experiences.[34] However, persistence of the anticoagulation treatment presents lower values when compared to direct oral anticoagulants for the same reasons explained, which can contribute to non-achievement of this goal.[32]

The highest percentage of specific goals achievement was related to the need to adapt the intake of food options rich in Vitamin K (74.0%; 37). It is understood that doubts related to this theme are very common in patients using warfarin.[34] Although this subject matter is frequently addressed during the AC appointments under study, it is perceived that this approach may not be sufficient to establish changes in the patients' eating habits. It is denoted that the CC offer may have contributed not only to the patients' awareness in relation to the magnitude of this theme regarding the treatment, but also to the decision of proposing goals aimed at behavior change. The CCs can be seen as a tool for the transposition of one of the major barriers related to health education actions: the use of acquired knowledge for a real transformation in the daily life practices of the social actors involved.[18]

The percentage of patients who did not achieve the specific goals in self-care (19.3%; 16), the percentage that did not define any general self-care goal in both approaches (5.8%; 6) and no specific goal (1.0%; 1), even if small, can be related to factors such as self-care complexity, lack of perception of the need and demotivation due to the dissociation between health perception and cardiovascular risk and the long-term characteristic required by the change of unhealthy behaviors. In addition to that, some patients may believe that only health professionals are responsible enough to occupy the position of making decisions about their care process.[24,27]

In relation to the missings, significant percentages of patients who did not answer at least one of the telephone contacts were identified, and this value was more significant (51; 49.5%) in the first telephone-mediated interaction. It is understood that the occurrence of a new face-to-face meeting (CC 2) before the second phone approach may have contributed to the verification of telephone contacts with the patients, as well as to raising awareness about the importance of the telephone-mediated interaction. This fact may have corroborated for the improvement in the percentages of missings identified in the second (without missing record) and third (18; 7.8%) phone contact.

The higher percentage of non-achievement of the specific goal (60.0%; 6) related to physical activity with a p-value of 0.001 suggests that both groups present a statistically significant difference in relation to this variable, and it is recommended to conduct studies with a broader approach. According to a number of studies, there are intrinsic and extrinsic motivations that determine the performance of physical exercises, that is, getting involved in this process for pleasure and satisfaction seemed to be more significant than simply because the activity was recommended by others.[24,34]

Furthermore, although the participation of other health professionals besides the pharmacist is important for self-care processes in health, it is known that care programs developed by pharmacists can provide important contributions regarding the achievement of health goals in middle-income countries such as Brazil, as well as in the rational use of medications.[30,36,37] According to a number of studies, patients with low literacy in health report worse experiences during communication with health professionals, such as physicians, than those with high or moderate literacy levels.[38]

The literature shows positive clinical outcomes in relation to self-care after interventions involving empowerment and pharmaceutical care in the context of chronic diseases, suggesting that participation of the pharmacist in this process motivated the patients to assume certain behaviors according to the knowledge acquired.[39,40] However, it is understood that, for the pharmaceutical professional to be able to offer this type of practice, it is necessary to experience philosophical changes in the context of the professional practice, whose training process is still mostly technical.[41] The offer of the intervention based on Paulo Freire's educational theory involves a constant process of criticism, awareness raising and adaptation to new health situations, not only by the students, but also by the educators.[17] In order to offer the intervention, the pharmacist who mediated the CCs had to go through an immersion process in Freire's readings, in addition to attending a specific training process.

The study limitations include the impossibility of extrapolating the data, the impossibility of checking the patient's reports in the practical context, the conduction of the educational intervention in a single health institution, restricting its results to geographic and social boundaries, and the inability to measure the achievement of the general goals proposed after the second CC. In addition to that, there were difficulties regarding the patients' attendance to the CCs of the educational intervention and in relation to the effective implementation of the telephone-mediated interactions.

The advantage is the possibility to better understand the decision-making process related to self-care in health by patients living in a middle-income country and in use of oral anticoagulants.

Conclusion

The results suggest that the educational intervention with an approach to self-care in health may have contributed to the identification and achievement of self-care goals in patients using warfarin, and more robust studies are recommended. This study may assist other health services which, perhaps, want to adopt the methodology as a contribution to achieving the goal of the "Medication without Harms" Challenge and, consequently, reduce possible disparities that can threaten health in vulnerable contexts.

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Collaborators

DVN, CBF and TRC were responsible for data conception and MOO, JMC and CMB were in charge of the design, data analysis and interpretation, and writing of the article. JMC, MAM and CMB were responsible for the relevant critical review of the intellectual content.

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Conflict of interest statement

The authors declare that there are no conflicts of interest in regarding this article**.**

References

1. World Health Organization. Medication without harm- global patient safety challenge on medication safety. WHO; 2017. Available in: https://www.who.int/patientsafety/medication-safety/medication-without-harm-brochure/en/. Acessed on: 8th Dec 2020.
2. Instituto para Práticas Seguras no Uso de Medicamentos (ISMP). Desafio global de segurança do paciente: Medicação Sem Danos. ISMP; 2018. Available in: https://www.ismp-brasil.org/site/wp-content/uploads/2018/02/ISMP_Brasil_Desafio_Global.pdf. Acessed on: 8th Dec 2020.
3. Martin BA, Chewning BA, Margolis AR, *et al*. Med Wise: A theory-based program to improve older adults' communication with pharmacists about their medicines. Res Social Adm Pharm. 2016; 12 (4): 569-577. DOI: 10.1016/j.sapharm.2015.09.010.
4. Peng TR, Wu TW. The Experience of Management of High-Alert Medications. Am J Med Qual. 2017; 32 (5): 571. DOI: 10.1177/1062860617699699.
5. Reading SR, Black MH, Singer DE, *et al*. Risk factors for medication non-adherence among atrial fibrillation patients. BMC Cardiovasc Disord. 2019; 19 (1): 1-12. DOI: 10.1186/s12872-019-1019-1.
6. Rydberg DM, Linder M, Malmström RE, *et al*. Risk factors for severe bleeding events during warfarin treatment: the influence of sex, age, comorbidity and co-medication. J Clin Pharmacol. 2020; 76 (6): 867-876. DOI: 10.1007/s00228-020-02856-6.
7. Sevilla-Cazes J, Finkleman BS, Chen J, *et al*. Association between patient-reported medication adherence and anticoagulation control. Am J Med. 2017; 130 (9): 1092-1098. DOI: 10.1016/j.amjmed.2017.03.038.
8. Gateman D, Trojnar ME, Agarwal G. Time in therapeutic range: warfarin anticoagulation for atrial fibrillation in a community-based practice. Can Fam Physician. 2017; 63 (10): 425-431.
9. Clarkesmith DE, Pattison HM, Khaing PH, *et al*. Educational and behavioural interventions for anticoagulant therapy in patients with atrial fibrillation. Cochrane Database Syst Rev. 2017; 4 (4): CD008600. DOI: 10.1002/14651858.CD008600.pub3.
10. Joshua JK, Kakkar N. Lacunae in Patient Knowledge About Oral Anticoagulant Treatment: Results of a Questionnaire Survey. Indian J Hematol Blood Transfus. 2015; 31 (2): 275–80. DOI: 10.1007/s12288-014-0415-z.
11. Wong PY, Schulman S, Woodworth S, *et al*. Supplemental patient education for patients taking oral anticoagulants: systematic review and meta-analysis. J Thromb Haemost. 2013; 11 (3): 491-502. DOI: 10.1111/jth.12107.
12. Hoque L, Amroze A, Gilvaz V, *et al.* Assessing Anticoagulation Management and Shared Decision-Making Documentation From Providers Participating in the SUPPORT-AF II Study. J Contin Educ Health Prof. 2020; 40 (2): 76-80. DOI: 10.1097/CEH.0000000000000293.
13. Backman WD, Levine SA, Wenger NK, *et al*. Shared decision-making for older adults with cardiovascular disease. Clin Cardiol. 2020; 43 (2): 196-204. DOI: 10.1002/clc.23267.
14. Zeballos-Palacios CL, Hargraves IG, Noseworthy PA, *et al*. Developing a conversation aid to support shared decision making: reflections on designing anticoagulation choice. Mayo Clin Proc. 2019; 94 (4): 686-696. DOI: 10.1016/j.mayocp.2018.08.030.
15. 15. Cortez DN, dos Santos JC, Macedo MM, *et al.* Efeito de um programa educacional em empoderamento do autocuidado para cumprimento de metas em diabetes. Cien y Enferm. 2018; 24: 23-32. DOI:10.4067/s0717-95532018000100203.
16. Barbosa HC. Protocolo EMPODERACO para mudança de comportamento de pacientes em anticoagulação oral com varfarina. [Dissertação de Mestrado]. Faculdade de Medicina da Universidade Federal de Minas Gerais, Belo Horizonte, 2019.
17. Horton M, Freire P, Bell B, *et al*. O caminho se faz caminhando: conversas sobre educação e mudança social, 2ª ed. Petrópolis: Vozes; 2003.
18. Wallerstein N, Giatti LL, Bógus CM, *et al*. Shared participatory research principles and methodologies: Perspectives

from the USA and Brazil—45 years after Paulo Freire's "pedagogy of the oppressed". Soci. 2017; 7 (2): 6. DOI: 10.3390/soc7020006.

19. Eickhoff JS, Wangen TM, Notch KB. Creating an anticoagulant patient education class. J Vasc Nurs. 2010; 28 (4): 132-135. DOI: 10.1016/j.jvn.2010.08.002.
20. Nasser S, Mullan J, Bajorek B. Educating patients about warfarin therapy using information technology: A survey on healthcare professionals' perspectives. Pharm pract. 2012; 10 (2): 97.
21. Nutescu EA, Wittkowsky AK, Burnett A, *et al*. Delivery of optimized inpatient anticoagulation therapy: consensus statement from the anticoagulation forum. Ann Pharmacother. 2013; 47 (5): 714-724. DOI: 10.1345/aph.1R634.
22. Lane DA, Barker RV, Lip YH. Best practice for atrial fibrillation patient education. Curr Pharm Des. 2015; 21 (5): 533-543. DOI: 10.2174/1381612820666140825125715.
23. Costa JM, Marcolino MS, Torres HC, *et al.* Protocol of a clinical trial study involving educational intervention in patients treated with warfarin. Medicine (Baltimore). 2019; 98 (22): e15829. DOI: 10.1097/MD.0000000000015829.
24. Jaarsma T, Cameron J, Riegel B, *et al.* Factors related to self-care in heart failure patients according to the middle-range theory of self-care of chronic illness: a literature update. Curr Heart Fail Rep. 2017; 14 (2): 71-77. DOI: 10.1007/s11897-017-0324-1.
25. Wang M, Holbrook A, Lee M, *et al.* Barriers and facilitators to optimal oral anticoagulant management: a scoping review. J Thromb Thrombolysis. 2020; 50 (3): 697-714. DOI: 10.1007/s11239-020-02056-0.
26. Ghoreishi MS, Vahedian-Shahroodi M, Jafari A, *et al*. Self-care behaviors in patients with type 2 diabetes: Education intervention base on social cognitive theory. Diabetes Metab Syndr. 2019; 13 (3): 2049-2056. DOI: 10.1016/j.dsx.2019.04.045.
27. Ammouri AA, Abu Raddaha AH, Tailakh A, *et al*. Risk knowledge and awareness of coronary heart disease, and health promotion behaviors among adults in Oman. Res Theory Nurs Pract. 2018; 32 (1): 46-62. DOI: 10.1891/0000-000Y.32.1.46.
28. de Melo Ghisi GL, Abdallah F, Grace SL, *et al*. A systematic review of patient education in cardiac patients: do they increase knowledge and promote health behavior change? Patient Educ Couns. 2014; 95 (2): 160-174. DOI: 10.1016/j.pec.2014.01.012.
29. Antonini FO, Heideman IT. Itinerário de Pesquisa de Paulo Freire: contribuições para Promover a Saúde no Trabalho Docente. Rev Bras Enf. 2020; 73. DOI: 10.5205/1981-8963-v12i2a109935p546-553-2018.
30. Leal PD, Amante LN, Girondi JB, *et al*. Construindo soluções para segurança do paciente cardiopata em uso de varfarina: estudo qualitativo. Text contex enf. 2020; 29. DOI: 10.1590/1980-265X-TCE-2018-0002.
31. Castro EM, Van Regenmortel T, Vanhaecht K, *et al*. Patient empowerment, patient participation and patient-centeredness in hospital care: a concept analysis based on a literature review. Patient Educ Couns. 2016; 99 (12): 1923-1939. DOI: 10.1016/j.pec.2016.07.026.
32. Paquette M, França LR, Teutsch C, *et al*. Dabigatran persistence and outcomes following discontinuation in atrial fibrillation patients from the GLORIA-AF registry. The Am J Cardiol. 2020; 125 (3): 383-391. DOI: 10.1016/j.amjcard.2019.10.047.
33. Salmasi S, Kwan L, MacGillivray J, *et al.* Assessment of atrial fibrillation patients' education needs from patient and clinician perspectives: a qualitative descriptive study. Thromb Res. 2019; 173: 109-116. DOI: 10.1016/j.thromres.2018.11.015.
34. Lee JA, Nguyen AL, Berg J, *et al*. Attitudes and preferences on the use of mobile health technology and health games for self-management: interviews with older adults on anticoagulation therapy. JMIR mHealth and uHealth. 2014; 2 (3): 3196. DOI: 10.2196/mhealth.3196.
35. Dutta MJ, Collins W, Sastry S, *et al*. A culture-centered community-grounded approach to disseminating health information among African Americans. Health Commun. 2018. DOI: 10.1080/10410236.2018.1455626.
36. Wilke T, Bauer S, Mueller S, *et al*. Patient preferences for oral anticoagulation therapy in atrial fibrillation: a systematic literature review. Patient. 2017; 10 (1): 17-37. DOI: 10.1007/s40271-016-0185-9.
37. Mourao AO, Ferreira WR, Martins MA. Pharmaceutical care program for type 2 diabetes patients in Brazil: a randomised controlled trial. Int J Clin Pharm. 2013; 35 (1): 79-86. DOI: 10.1007/s11096-012-9710-7.
38. King SR, King ER, Kuhl D, *et al*. Health literacy and the quality of pharmacist-patient communication among those prescribed anticoagulation therapy. Res Social Adm Pharm. 2021; 17 (3): 523-530. DOI: 10.1016/j.sapharm.2020.04.026.
39. Aquino JA, Baldoni AO, Di Lorenzo OC, *et al*. Pharmacotherapeutic empowerment and its effectiveness in glycemic control in patients with Diabetes Mellitus. Diabetes Metab Syndr. 2019; 13 (1): 137-142. DOI: 10.1016/j.dsx.2018.08.002.
40. Rampamba EM, Meyer JC, Helberg EA, *et al.* Empowering Hypertensive Patients in South Africa to Improve Their Disease Management: A Pharmacist-Led Intervention. J Res Pharm Pract. 2019; 8(4): 208-213. DOI: 10.4103/jrpp.JRPP_18_74.
41. de Oliveira DR. Atenção Farmacêutica: da filosofia ao gerenciamento da terapia medicamentosa, 1ª ed. São Paulo: RCN Editora; 2011.