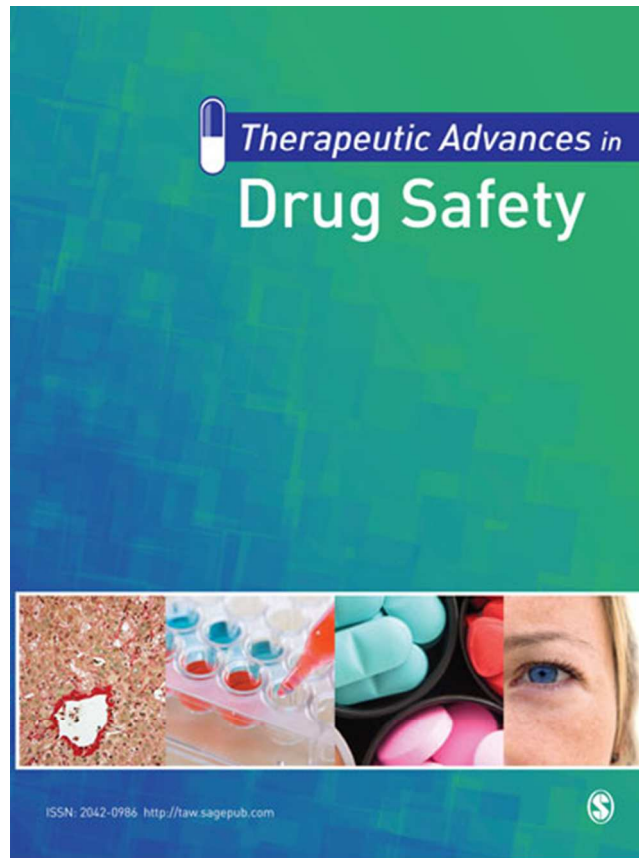


This item is the archived preprint of:

The willingness and attitude of patients towards self-administration of medication in hospital

Reference:

Vanwesenael Toke, Boussery Koen, van den Bemt Patricia, Dilles Tinne.- The willingness and attitude of patients towards self-administration of medication in hospital
Therapeutic Advances in Drug Safety - ISSN 2042-0994 - (2018), p. 1-13
Full text (Publisher's DOI): <https://doi.org/doi:10.1177/2042098618764536>



The willingness and attitude of patients towards self-administration of medication in hospital.

Journal:	<i>Therapeutic Advances in Drug Safety</i>
Manuscript ID	TAW-17-11-037.R2
Manuscript Type:	Original Article
Date Submitted by the Author:	n/a
Complete List of Authors:	Vanwesemael, Toke; Universiteit Antwerpen Faculteit geneeskunde en gezondheidswetenschappen, Department of Nursing Science and Midwifery Boussery, Koen; Universiteit Gent, Pharmaceutical Care Unit, Faculty of Pharmaceutical Sciences van den Bemt, Patricia; Erasmus University Medical Center, Department of Hospital Pharmacy Dilles, Tinne; Universiteit Antwerpen Faculteit geneeskunde en gezondheidswetenschappen, Department of Nursing Science and Midwifery; Thomas More University College, Department of Healthcare
Abstract:	Aim To describe patients' willingness towards self-administration of

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

	<p>medication whilst in hospital. Background Literature suggests a positive impact of self-administration of medication during hospitalization on medication adherence and safety, and on patient satisfaction. However, self-administration is not a common practice in Belgian hospitals. Design and setting A cross-sectional observational study was conducted in three Belgian hospitals in November-December 2015. Participants All patients of 14 randomly selected wards were asked to participate. Data collection The structured questionnaire comprised patient characteristics, their willingness and attitude towards self-administration of medication, perceived ability to self-administer during hospitalization, and prerequisites and perceived consequences. Results In total 124 patients participated, 36% of all eligible patients. The main reasons not to participate were the patients' physical and mental condition (30%) and the absence of patients during the time of data collection (23%). The majority of the 124 participating patients had a positive attitude towards the implementation of self-administration, 83.9% was willing to self-administer their medication whilst in hospital. Most important prerequisites were self-administration at home before and after hospitalization, patients' motivation, and a regular evaluation of the patients' competences. Patients acknowledged benefits such as an increase in autonomy, independence and medication knowledge. Patients did not expect self-administration would cause important safety issues. Conclusion The majority of patients, capable of participating in the study, would want to self-administer medication during hospitalization. They had a positive attitude towards self-administration of medication. Nevertheless, patients stated important conditions which need to be considered in order to implement self-administration.</p>

SCHOLARONE™
Manuscripts

Review

Original Article: observational cross-sectional study

Corresponding Author:

Toke Vanwesemael, Department of Nursing Science and Midwifery, Faculty of Medicine and Health Sciences, University of Antwerp, Universiteitsplein 1, 2610 Wilrijk, Belgium Email: toke.vanwesemael@uantwerpen.be

The willingness and attitude of patients towards self-administration of medication in hospital.

Vanwesemael, Toke^{1,2} BN, MS, PhD student
Boussery, Koen³ PharmD, PhD
van den Bemt, Patricia M.L.A.⁴ PharmD, Phd
Dilles, Tinne^{1,2} BN, MS, PhD

¹ Department of Healthcare, Thomas More University College, Antwerpsestraat 99, 2500 Lier, Belgium

² Department of Nursing Science and Midwifery, Centre for Research and Innovation in Care (CRIC), Nurse and Pharmaceutical Care (NuPhac), Faculty of Medicine and Health Sciences, University of Antwerp, Universiteitsplein 1, 2610 Wilrijk, Belgium

³ Pharmaceutical Care Unit, Faculty of Pharmaceutical Sciences, Ghent University, Ottergemsesteenweg 460, 9000 Ghent, Belgium

⁴ Department of Hospital Pharmacy, Erasmus University Medical Center, 's Gravendijkwal 230, 3015 CE Rotterdam, The Netherlands

Abstract

Aim To describe patients' willingness towards self-administration of medication whilst in hospital. **Background** Literature suggests a positive impact of self-administration of medication during hospitalization on medication adherence and safety, and on patient satisfaction. However, self-administration is not a common practice in Belgian hospitals. **Design and setting** A cross-sectional observational study was conducted in three Belgian hospitals in November-December 2015. **Participants** All patients of 14 randomly selected wards were asked to participate. **Data collection** The structured questionnaire comprised patient characteristics, their willingness and attitude towards self-administration of medication, perceived ability to self-administer during hospitalization, and prerequisites and perceived consequences. **Results** In total 124 patients participated, 36% of all eligible patients. The main reasons not to participate were the patients' physical and mental condition (30%) and the absence of patients during the time of data collection (23%). The majority of the 124 participating patients had a positive attitude towards the implementation of self-administration, 83.9% was willing to self-administer their medication whilst in hospital. Most important prerequisites were self-administration at home before and after hospitalization, patients' motivation, and a regular evaluation of the patients' competences. Patients acknowledged benefits such as an increase in autonomy, independence and medication knowledge. **Patients** did not expect self-administration would cause important safety issues.

Conclusion The majority of patients, capable of participating in the study, would want to self-administer medication during hospitalization. They had a positive attitude towards self-administration of medication. Nevertheless, patients stated important conditions which need to be considered in order to implement self-administration.

Keywords

Self-administration of medication, SAM, patient, perspectives, attitudes, hospital, nursing

Introduction

Background

Administration of medication in acute care settings is traditionally a nursing responsibility. Nevertheless, self-administration of medication by patients during their hospitalization has been reported in literature since 1959¹. It relates to the process in which patients prepare and consume medications themselves rather than a health professional taking on this role.

Two systematic reviews on self-administration of medication by hospitalized patients described the structure and implementation of several self-administration of medication schemes and self-administration of medication programmes^{2,3}. Studies on self-administration described advantages compared to administration of medication by nurses, such as an increased patient satisfaction and an improvement of adherence to pharmacotherapy and self-care competence²⁻⁴.

The prevalence of self-administration has not been studied extensively. A Flemish prevalence study indicated 22% on a total population of 1269 hospitalized patients self-administered at least one medication during their hospitalization. According to the opinion of the head nurses in this study, almost twice this number of hospitalized patients would have been able to self-administer their medication during hospitalization (41%). The decision-making process of allowing self-administration was mostly shared between the treating physician, the nurse, and the patient. Therefore, requiring an engagement of every stakeholder. Although, hospital pharmacists were not involved in the decision-making process, they remain responsible for e.g. medication provision in hospitals and should be involved in self-administration of medication^{5,6}. A study by McLeod et al. which took place in English National Health Service (NHS) hospitals showed the majority of surgical and medical wards (93%) did have a patient self-administration policy⁷.

In implementing self-administration of medication, the patients' attitude - as a key stakeholder - is essential. Studies on the opinion or attitudes of patients towards self-administration of medication are however scarce. A study by Deeks and Byatt showed self-administering patients had a significantly better overall impression of care, and were significantly more willing to self-administer medication if hospitalized again⁴. In a qualitative study by Manias et al., patients described benefits of self-administration, such as; an increased patient control, it allows respect for patient knowledge, it encourages a more sharing nurse-patient relationship, and it helps to reinforce the patients' knowledge about medication⁸. Another qualitative descriptive research on healthcare providers' and patients' perspectives on self-administration of medication during the patients' hospital stay identified some important perspectives concerning patients. Participants were convinced self-administration would lead to more satisfied patients, who feel more autonomous and independent. Moreover, patients indicated the benefit of being in control of their own medication, they would not have to

disturb nurses in order to question them concerning when and which type of medication would be administered. Patients suggested this approach would result in safer medication management. Although, patients were very positive, they also acknowledged the possibility of medication being abused or stolen by other patients. Also, a possible challenge could be the use of medication from the hospital formulary, resulting in difficulties recognizing generic or brand alternatives⁹.

To increase levels of implementation, patients' attitude towards self-administration of medication in hospital has to be known, acknowledged, and taken into account in change management. The presence of qualitative studies concerning this topic allowed the research team to develop a questionnaire. This made it possible to investigate the willingness and attitude of a larger sample of patients.

This study aimed to describe the willingness of Flemish hospitalized patients to self-administer medication and their attitude towards it. Secondary, this study aimed to describe the association of several factors with the willingness to self-administer medication, and to describe the ability of patients to self-administer as well as prerequisites and perceived consequences of self-administration. These results will be taken into account when developing a self-administration of medication policy in Belgian hospitals.

Methods

Design

An observational cross-sectional study was conducted in three Belgian hospitals. Hospitalized patients were questioned in a structured interview on their willingness and attitude towards self-administration of medication.

Participants

In each of two university hospitals and one general hospital, five different wards were randomly selected and invited to participate. The following wards were excluded because of their specific medication management process: paediatrics, emergency departments, intensive care units, operating theatres, and day hospitals. One ward refused to participate due to time restraints. All hospitalized patients, on the day of data collection (n= 342) on these wards were first screened in consultation with the head nurse. Patients were excluded if they were deemed to be too ill to participate, not present on the ward at the time of data collection, not able to speak Dutch, or aged younger than 18 years. The remaining patients were informed about the study and asked to sign informed consent in case of participation (see Table 1).

	n	%
Hospitalized patients on included wards	342	100.0
Step 1: Screening in consultation with head nurse		
Excluded because of:		
Too ill to participate	100	29.3

	Not present during study	78	22.8
	Not able to speak Dutch	17	5.0
<hr/>			
Step 2: Providing oral and written informed consent for patients			
	Refused to participate	23	6.7
<hr/>			
Participating patients in the study		124	36.3
Hospitalized on:			
	Surgical ward	64	51.6
	Medical ward	53	42.7
	Geriatric ward	4	3.2
	Rehabilitation ward	3	2.4

Table 1 Flowchart of participants in the study

Data collection

A self-developed structured questionnaire was used. Firstly, patients were questioned about their characteristics (demographic data and routines of managing chronic medication at home). Secondly, they were questioned about their ability to self-administer medication in hospital. **This concerned their own opinion on their ability to self-administer.** If they already took chronic medication at home, it concerned the ability to self-administer these medications during hospitalization. If they did not take any chronic medication, it concerned their ability to self-administer medication they got during that particular hospital stay. Thirdly, their attitude towards self-administration of medication in hospital was questioned by a set of five questions. They could be answered with the use of a four-point Likert scale: strongly disagree-disagree-agree-strongly agree. **Fourthly, one explicit question on the patients' opinion on being keen to self-administer questioned their actual willingness to self-administer with the use of a six-point Likert scale; absolutely not willing, not willing, rather not willing, rather willing, willing, absolutely willing.** In the end, their opinion on prerequisites and consequences of self-administration of medication in hospital were assessed (see Table 2 for the structure of the questionnaire and Table 4, Figure 3 and 4 for the items).

Structured patient questionnaire	n of questions
<hr/>	
1. Patient characteristics	
a. Demographic data	7
b. Medication management chronic medication	2

2. Ability to self-administer medication in hospital	1
3. Attitude towards self-administration of medication in hospital	5*
4. Willingness to self-administer medication in hospital	1 ⁺
5. Opinion on prerequisites for self-administration of medication	8*
6. Opinion on consequences of self-administration of medication	7*

* 4 point Likert scale: strongly disagree-disagree-agree-strongly agree

⁺ 6 point Likert scale: absolutely not willing, not willing, rather not willing, rather willing, willing, absolutely willing

Table 2. Structured overview of the patient questionnaire

The questionnaire was developed using results from a previous prevalence study on self-administration of medication⁵, and a literature review on potential influencing factors of self-administration, benefits and prerequisites for self-administration of medication^{4,8,9}. The questionnaire was completed, if needed with the help of the interviewer who wrote down the answers for the participant. Data collection was conducted between November and December 2015.

Study outcomes

The primary outcome of this study was the willingness of patients to self-administer medication during hospitalization and their attitude towards self-administration of medication. The secondary outcome of this study were the patient characteristics associated with the patients' willingness to self-administer, the ability of patients to self-administer, prerequisites for self-administration of medication, and perceived consequences of self-administration.

Ethical considerations

Permission of the ethics committee of a University Hospital was received (reference B300201422410). Each patient signed an informed consent document before participating in this study. All collected data were coded.

Data analysis

The Statistical Package for Social Sciences (SPSS) version 24.0 (SPSS Inc, Chicago, IL, USA) was used to analyse the data. Kolmogorov-Smirnov and Shapiro-Wilk tests showed non-normality of the distributions of age, number of chronic medications taken, the total attitude of patients towards self-administration of medication and their willingness to self-administer. Non-parametric statistics were used to analyse these data. Discontinuous data were described using frequency distributions. Continuous data were described using a mean value and standard deviation if normally distributed, or using a median and range if non-normally distributed. A p-value ≤ 0.05 was considered as statistically significant.

The willingness of patients to self-administer medication during hospitalization was questioned with the use of a six-point Likert scale. The attitude of patients towards self-administration of medication in hospital was questioned by a set of five questions, they could be answered with the use of a four-point Likert scale. Out of this set of questions, the first four questions were combined into a scale to describe the overall attitude towards self-administration of medication (see Table 4 for the content of these questions). Before including all questions into this scale, question four was recoded from a negative into a positive statement. The scale was constructed with the use of a sum score of the four questions, resulting in a number between zero and 12. The higher the number, the more positive the attitude of the patients. The internal consistency of this scale was calculated with Cronbach's alpha.

Results

Population

In total 36.3% of all eligible patients (n= 124) participated in the study (see Table 1). The main reasons not to participate were the patients' illness (29.3%), the patient was not present during the time of research (22.8%), and the patient refused to participate (6.7%). Patients were recruited from surgical (51.6%), medical (42.7%), geriatric (3.2%) and rehabilitation wards (2.4%).

Table 3 shows the characteristics of all included hospitalized patients; 46.0% were male, the mean age was 60 years old. Primary education was the highest educational level of 15.3%, over half of the population completed secondary education (55.6%), and 16.1% obtained a bachelor's degree. More extended knowledge of the health care system could be expected in 18.9%, currently working in healthcare. Most of the patients remained in hospital in the past two years, most of them were hospitalized 1-5 nights (29.0%). On a total of 124 patients, 77.1% took chronic medications at home. They took 5 different medications on average. The majority of included patients (92.6%) did completely self-manage these medications at home.

Participant characteristics (n= 124)	
Male (%)	46.0
Age (median [range])	60.5 [18-97]
Age (mean (SD))	59.6 (18.5)
Level of education (%)	
None	4.8
Primary school	15.3
Secondary school	55.6
Bachelor	16.1
Master	8.1

Educated in healthcare (%)		18.9
Working in healthcare (%)		18.9
Hospitalized nights in the past 2 years (%)		
	0	15.3
	1-5	29.0
	6-10	13.7
	11-15	4.0
	16-30	15.3
	>30	22.6
Chronic medication intake at home		
	Yes (%)	77.1
	mean (SD)	4.5 (3.5)
Chronic medication management at home (%) (n= 94)		
	Self-management	92.6
	Aid for preparing	4.3
	Aid for preparing and taking	3.2

Table 3. Participant characteristics

Medication use in the population was related to age. Patients who were taking chronic medication at home were significantly older, compared to those who were not (respectively 62.8 years and 46.1 years, Mann-Whitney U, $p < .001$). Furthermore, a positive correlation between the age and the number of chronic medications taken at home was found (Spearman's rho, $r = .298$, $p = .006$).

Patients' willingness and attitude towards self-administration of medication in hospital

Figure 1 shows the actual willingness of patients to self-administer medication in hospital, if their health condition would allow them to do so.

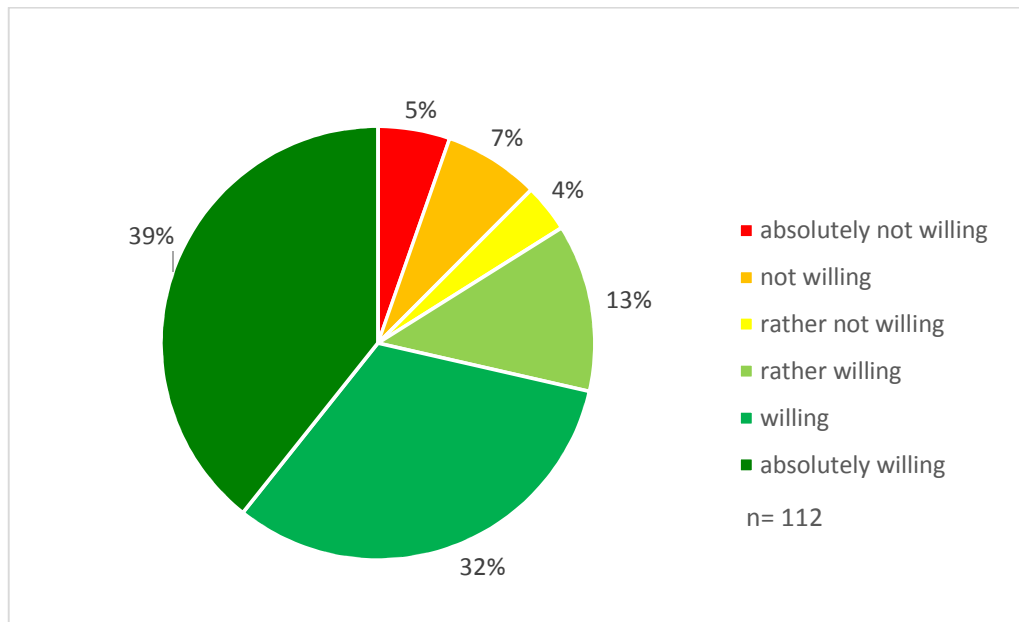


Figure 1. Willingness of patients to self-administer medication in hospital

The majority of patients, stated that they were willing to self-administer their medication in hospital (83.9%).

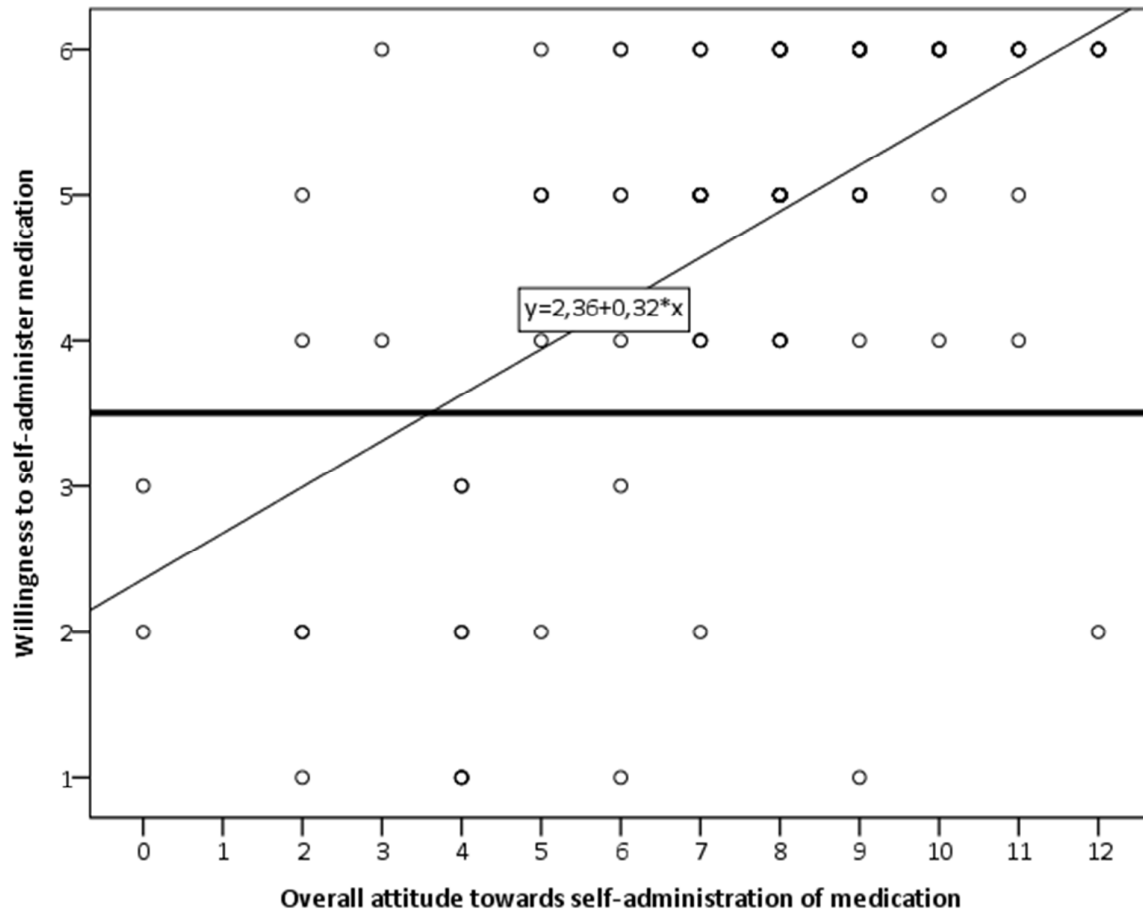
The patients' attitude towards self-administration of medication was questioned in five questions (see Table 4).

I think that... n=118	Disagree* (%)	Agree* (%)
1. patients should be able to continue their own home routines of medication preparation and administration when hospitalized.	14.2	85.8
2. if I wish to self-administer and I am able to, I should be allowed to do so during a hospital stay.	19.7	80.3
3. patients should be stimulated to self-administer medication during hospitalization so they can learn how to take medication correctly.	27.4	72.6
4. it is always the duty of nurses to prepare and administer medication, even for patients who would be able who do this themselves.	59.8	40.2
5. I can only self-administer my medication during hospitalization if a healthcare professional monitors me.	55.7	44.3
Total opinion on self-administration of medication*		
	Median [range]	8 [0-12]
	Mean (SD)	7.5 (2.7)

1
2
3
4 ** Disagree: sum of % patients who indicated strongly disagree and disagree; Agree: sum of
5 % patients who indicated agree and strongly agree
6 * The total opinion was calculated by adding statement 1 - 4. Statement 4 was initially
7 negative and therefore recoded into a positive statement. The internal consistency of this scale
8 is $\alpha = 0.786$.

9
10 Table 4. The attitude of patients towards self-administration of medication in hospital

11
12 The results indicated that patients were convinced they should be able to proceed their home
13 routines of medication management whilst in hospital (85.8%). Also, patients stated if they
14 wished to and were able to self-administer, they should be allowed to do so in hospital
15 (80.3%). Furthermore, participating hospitalized patients in this study agreed with the
16 statement "Patients should be stimulated to self-administer medication during hospitalization
17 so they can learn how to take medication correctly" (72.6%). This is in line with the almost
18 60% of the participants in this study whom did not agree with the quote "it is always the duty
19 of nurses to prepare and administer medication, even for patients who would be able who do
20 this themselves". When self-administering medication, 55.7% of the patients did not agree
21 that healthcare professionals need to monitor the medication administration of the patients.
22 As shown in Figure 2, the willingness of patients positively correlated with the patients'
23 overall attitude towards self-administration of medication (Spearman's rho, $r = .570$, $p < .001$).
24 This overall attitude was calculated by four questions, that were integrated into a scale
25 defining the overall attitude of patients towards self-administration of medication in hospital
26 ($\alpha = 0.786$).
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60



Legend

n= 111, Spearman's rho, $r = .570$, $p = < .001$

- Willingness of patients; 1= absolutely not willing, 2= not willing, 3= rather not willing, 4= rather willing, 5= willing, 6= absolutely willing
- Attitude towards self-administration of medication; calculated from questions 1-4 ($\alpha = 0.786$); range from 0-12.

Figure 2. Relationship between willingness to self-administration of medication and the overall attitude towards self-administration of medication.

Association between patient characteristics and their willingness to self-administer medication

As described in Table 5, patients in this study who were willing to self-administer medication tended to be younger compared to those who were not (One-Way ANOVA, $p = 0.345$), and did self-administer their chronic medication more often at home (Kruskal-Wallis, $p = 0.306$). The only factor significantly related to the willingness of patients to self-administer was their own perceived ability to self-administer medication in hospital. Patients who were convinced of their own ability to self-administer were more willing to do so compared to those who

stated they would need partial or full help with self-administering medication in hospital (Kruskall-Wallis, $p < 0.001$).

	n	Willingness to self-administer medication in hospital						p
		absolutely not willing	not willing	rather not willing	rather willing	willing	absolutely willing	
Age (years, mean)	112	74.2	63.8	60.5	59.0	58.6	58.3	.345
MM at home* (%)								
Self-administration ⁺	80	6.3	6.3	2.5	12.5	28.8	43.8	
Partial help ⁺	4	0.0	0.0	0.0	25.0	50.0	25.0	.306
Full help ⁺	2	50.0	0.0	50.0	0.0	0.0	0.0	
Ability to self-administer in hospital (%)								
Self-administration ⁺	84	2.4	4.8	1.2	8.3	36.9	46.4	
Partial help ⁺	15	6.7	6.7	6.7	26.7	26.7	26.7	<.001
Full help ⁺	9	33.3	33.3	0.0	22.2	11.1	0.0	

*MM: medication management

⁺Self-administration: patients self-administer their medication completely independent, Partial help: patients receive partial help and administer medication independent, Full help: patients are fully dependent on nurses for medication management.

Table 5. Relationship between patient characteristics and their attitude towards self-administration of medication

Patients' ability to self-administer medication in hospital

Patients were questioned about their opinion concerning their own ability to self-administer medication during their hospitalization (see Table 6).

	n	Ability to self-administer medication in hospital*			p ⁺
		Self-administration	Partial help	Full help	
Chronic medication intake at home (%)					
Yes	85	80.0	14.1	5.9	.896

No	26	80.8	3.8	15.4
----	----	------	-----	------

* Self-administration: patients able to self-administer their medication completely independent, Partial help: self-administer them independent if they got some help in for example filling their medication box, Full help: be fully dependent on the administration of medication by nurses.

+ Mann-Whitney test

Table 6. Patients’ perception of their own ability to self-administer medication in hospital

If they stated they did take chronic medication, they were questioned about their ability to self-administer these. A total of 80.0% indicated they would be able to self-administer their chronic medication completely **independently** in hospital, 14.1% would self-administer them independent if they got some help in for example filling their medication box, and 5.9% would be fully dependent on the administration of medication by nurses. If they stated they did not take any chronic medication at home, they were questioned about their ability to self-administer their prescribed medication during hospitalization. A total of 80.8% indicated they would be able to self-administer their medication completely independent, 3.8% would self-administer them independent if they got some help in for example filling their medication box, and 15.4% would be fully dependent on the administration of medication by nurses.

Prerequisites for self-administration of medication

Patients were questioned about important prerequisites for self-administration of medication (see Figure 3).

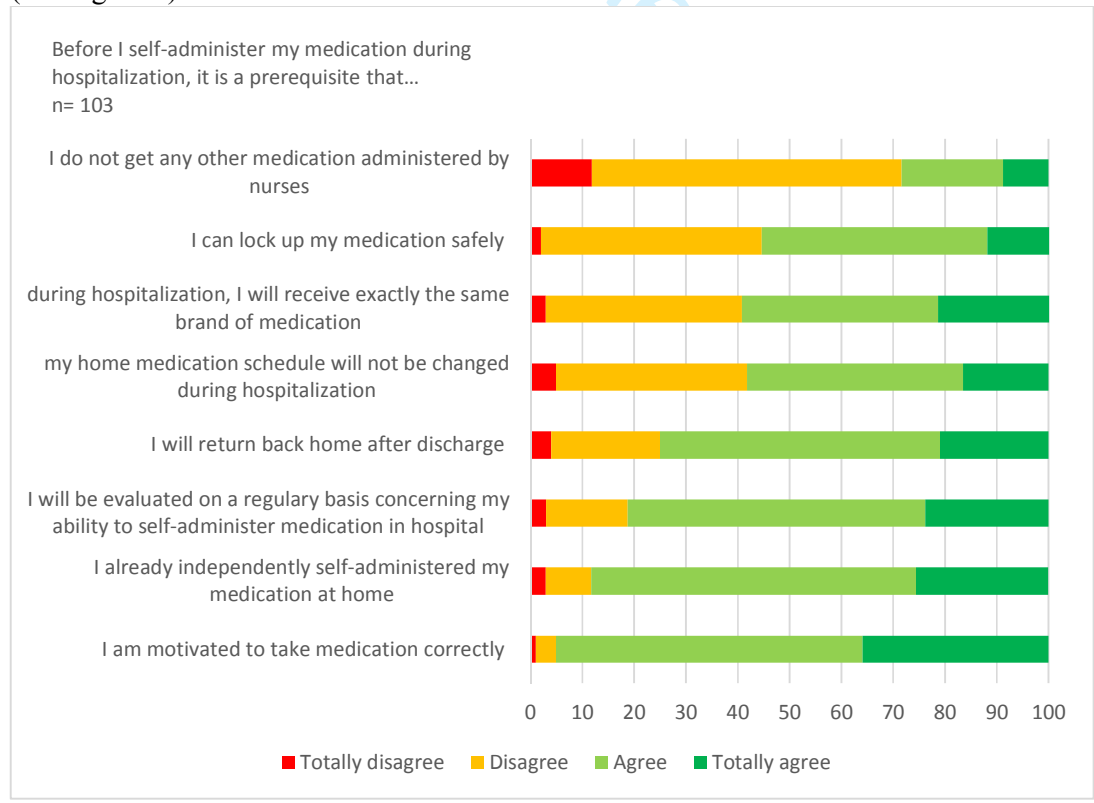


Figure 3. Prerequisites for self-administration of medication

The majority of participants indicated that patients had to be motivated to self-administer (95.1%) and should already be self-administering medication at home before their hospitalization (88.2%). On top of this, patients acknowledged the importance of a regular evaluation of the patients' ability to self-administer (81.2%). The prospect of returning home after discharge was another important condition (75.0%). Most patients would not mind a combination of self-administered medication and medication administered by nurses (71.6%). Opinions on locking up self-administered medication, receiving the exact same brand of medication during self-administration, and changes in the home medication schedule during hospitalization were divided. Some patients thought these prerequisites to be necessary, others did not. No significant differences between patient characteristics and prerequisites could be found.

Perceived consequences of self-administration of medication

Hospitalized patients were questioned about the perceived consequences of self-administration of medication in hospital (see Figure 4).

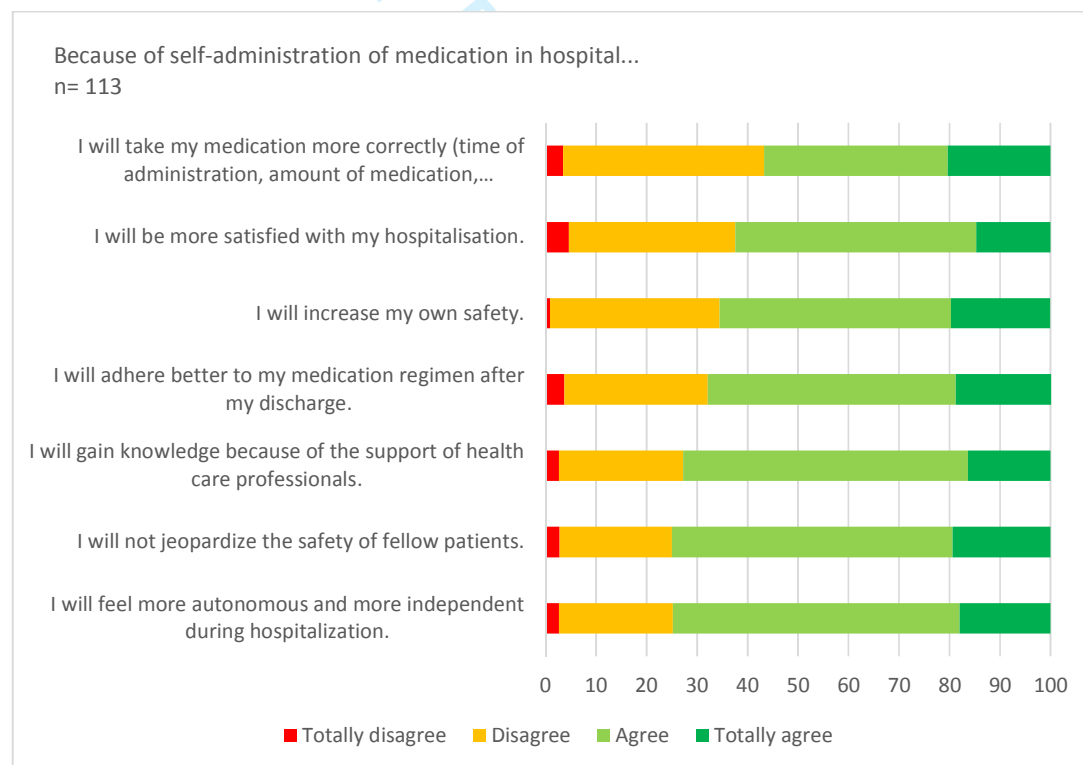


Figure 4. Consequences of self-administration of medication

Three out of four patients were convinced that self-administration would increase their autonomy and the feeling of being independent, it would not jeopardize the safety of other patients, and they would also gain knowledge on the medication through the support they would receive from health care professionals. Patients also suggested that self-administration would result in an increased compliance after their discharge (68%) and it would even increase their own safety whilst in hospital (65.4%). A smaller percentage of the patients

1
2
3 indicated that, self-administration would make them more satisfied about their hospital stay
4 (62.4%). Over half of the patients were convinced self-administration would lead to patients
5 taking their medication more **correctly** compared to administration of medication by nurses
6 (56.7%).
7

8 Discussion

10 Main findings – willingness and attitude towards self-administration 12 of medication

14 The study resulted in valuable insights into the willingness and attitude of hospitalized
15 patients concerning self-administration of medication in hospital. Patients indicated they were
16 very willing to self-administer medication, and they judged themselves capable to do so while
17 in hospital. The majority of the patients would appreciate it, if health care providers would
18 facilitate this. They had an overall positive attitude towards self-administration of medication.
19 These findings are consistent with those of Deeks et al. who described patients who already
20 self-administered medication were significantly more likely to be willing to self-administer
21 medication again during a future hospitalization⁴. Also, a qualitative study by Manias et al.
22 and Vanwesemael et al. indicated patients were positive about self-administration of
23 medication^{8,9}.
24
25

27 Patients were very positive towards maintaining their own home routines in medication
28 management in hospital. Literature indicated this comes with an extra benefit, as it may
29 contribute to increased adherence. A systematic review and meta-analysis on medication
30 adherence difficulties identified that creating a habit-based intervention that links the patients'
31 daily routines to medication administration, results in an increased adherence. When
32 practicing self-administration of medication in hospital, both patients and health care
33 professionals can work together to create those links, e.g. take medication right before
34 breakfast¹⁰. A systematic review on self-administration of medication programmes confirmed
35 the increase of compliance and decrease of medication errors².
36 Although, there definitely is a reason to believe self-administration benefits adherence, this
37 might still be very much influenced by the patients' drug regimen. Research by Vanwesemael
38 et al. indicated the complexity of a patients' drug regimen as an important obstacle to
39 implement self-administration. A relevant quote underpinned this issue; "*Medication for*
40 *kidney patients is so delicate, so precise that they (care team) want to have it all in their own*
41 *hands. We will rarely be able to put a red star next to a kidney patient [mark of self-*
42 *management of medication]."* (Nurse 1). This study not only highlighted a complex regimen
43 as an obstacle, also changes due to medical examinations that influenced the drug regimen⁹.
44
45
46

47 Also, patients in this study indicated self-administration as a possibility to learn how to take
48 medication correctly. This might impact medication related problems after discharge. A Dutch
49 study on patients' medication related problems after hospital discharge (n=124) indicated 15%
50 of the population experienced medication related problems (e.g. the indication and how to use
51 the medication was not clear) and 27% reported side effects after hospital discharge¹¹.
52 Allowing patients to already self-administer medication in hospital provides a certain amount
53 of days to observe the patients' medication management. When observing medication errors,
54 health care professionals have the opportunity to detect errors in patients' home routines, and
55 are able to react and implement interventions. A systematic review on the effects of self-
56
57
58
59
60

1
2
3 administration of medication confirms the positive effect on increased knowledge about
4 medication and medication regimens³. Concerning patients, being able to already self-
5 administer in hospital allows them to practice unfamiliar medication administration routes
6 before being discharged^{8,9}. In conclusion, observing and evaluating patients' self-
7 administration of medication management is of great importance. Yet, in order to be able to
8 sufficiently and correctly evaluate this medication management, it is necessary that patients
9 stay hospitalized for a sufficiently long period of time.

11 Secondary outcomes

13 The association between patient characteristics and their willingness to self-administer was
14 reported. Younger patients tended to be more willing to self-administer their medication. This
15 result seems to be consistent with other research which found self-administering patients were
16 on average younger compared to non self-administering patients (self-administering patients:
17 52.7 years; non self-administering patients: 66.4 years; $p < 0.001$)⁵. The current study did not
18 investigate the association between patient characteristics such as functional status, disease
19 severity, or length of stay and their willingness to self-administer. A previous study however
20 indicated self-administering patients were mostly women, had a lower number of different
21 medications per day before and after their hospitalization. Self-administering patients mostly
22 came from their own home environment and returned back there after discharge. Also, self-
23 administering patients had a better general health status and were less depending on nursing
24 aid during their hospital stay⁵.

27 The participating patients were asked to judge for themselves whether they would be able to
28 self-administer their medication in hospital. If they already took chronic medication at home,
29 it concerned this medication. If they did not take any medication at home before
30 hospitalization, it concerned the medication administered during their hospitalization. There
31 were no significant differences found between the group of patients who already took chronic
32 medication at home or patients who did not and their own perceived ability to self-administer.
33 Overall, patients judged themselves capable to self-administer. Nevertheless, this cannot be
34 the only evaluation before actually performing self-administration in hospital. Literature
35 clearly described the necessity of an assessment to objectively define the actual competencies
36 and ability of the patient. This assessment should take several aspects into account, i.e.
37 specific conditions related to the patients; mental and physical condition, conditions related to
38 the type of medication; high/low-risk medication, intravenous medication⁹.

41 Important prerequisites for self-administration of medication were questioned. More than half
42 of the patients did not consider it necessary to have health care professionals monitor patients
43 while self-administering medication. This might be explained by the majority of patients
44 estimating themselves able to self-administer medication in hospital. They assumed by being
45 able to self-administer, they did not need any monitoring while doing so.

47
48 Compared to patients indicating monitoring is not really needed, 81% considered it necessary
49 that patients were regularly evaluated on their ability to self-administer medication. These
50 findings highlight another aspect namely evaluation of the patients' competences in order to
51 self-administer medication. Patients do think it is necessary to evaluate patients on their
52 capabilities or competences to self-administer. At this moment, several existing self-
53 administration of medication programmes include a tool to evaluate patients' competences in
54 order to self-administer³. Nevertheless, only two articles described the validation of a tool,
55 named Self-Administration of Medication (SAM). This tool aimed to objectively determine
56
57
58
59
60

1
2
3 patients' ability to self-administer^{12,13}. These findings confirm the need for further research
4 on the validation of tools in different patient populations. If patients are deemed capable to
5 self-administer their medication, patients did not consider it necessary to be monitored by
6 professionals. Yet, from the health care professional point of view a monitoring system for
7 self-administration is recommended. In Belgium, it is possible to allow self-administration of
8 medication. Yet, if implemented, this has to be noted in the patients' personal medical file,
9 and it has to be clearly described which medication is self-administered and which is
10 administered by the nurses. Healthcare providers have a duty of care and a duty of
11 surveillance at all time. If any problems occur during self-administration, these have to be
12 noted in the medical files. The treating physician is then held responsible (Care inspection of
13 the Flemish division of Wellbeing, Public Health and Family, personal communication,
14 October 2015). The duty of care and surveillance allows healthcare providers to identify
15 possible medication errors and implement patient tailored interventions. Again, these
16 interventions might prevent medication errors occurring after hospital discharge^{2,3,5}.

18
19 Participants in this study indicated some prerequisites for self-administration of medication,
20 e.g. only patients who already self-administered medication at home before hospitalization,
21 and will be self-administering after discharge should be allowed to self-administer
22 medication. These study findings might be combined with previous study findings from
23 Vanwesemael et al., resulting in a list of prerequisites for patients before allowing self-
24 administration of medication in hospital⁵.

26
27 From this study, we are able to conclude that patients believe it is possible to combine self-
28 administration of medication and administration of medication by nurses. Nevertheless, it was
29 suggested that combining both should be communicated clearly with the patient in order to
30 prevent a lack of clarity. Also, communicating clearly about any changes in the medication
31 schedule is considered important, because 58.2% of the patients stated, "not changing the
32 medication schedule from home during hospitalization" as a prerequisite for self-
33 administration. This communication might prevent problems concerning the medication
34 schedule after discharge.

36
37 A study by Manias et al. showed several patients were worried about possible misuse of their
38 medication by others⁸. This result was also discussed by Vanwesemael et al., this study
39 suggested lockers to safely store medication and prevent other patients from abusing or
40 stealing medication⁹. However, findings in this study indicated patients did not fully agree on
41 the fact that a locker for storing their medication is necessary. In the end, it should always be
42 stated clearly in the hospital self-administration of medication policy whether it is essential
43 to lock away self-administered medication or where to store this (e.g. inside a locker).

45
46 At the end of the questionnaire, possible perceived consequences of self-administration of
47 medication were questioned. These study findings are in line with previous quantitative and
48 qualitative research. Specifically, an increased autonomy or feeling of being independent,
49 increased patient satisfaction, gaining knowledge on medication, and increasing compliance
50 after discharge were previously described^{3,4,8}. This study added more insights into the
51 patients' beliefs about the safety of self-administration: they did not especially worry about
52 their own or others safety while self-administering.

53 Implications for practice

54
55
56
57
58
59
60

1
2
3 The main objective of this study was to gain an insight in the willingness and attitude of
4 hospitalized patients towards self-administration of medication. Given the very positive
5 results and the willingness of patients to self-administer, focus on increasing the
6 implementation of this concept in daily practice is of foremost importance.
7

8 While in our study patients who were willing to self-administer were younger, this did not
9 reach statistical significance. Previous research did prove self-administering patients tended to
10 be younger, more healthier and rather independent during their hospital stay. Also, these
11 patients were more prevalent on surgical short-stay wards, psychiatric wards, surgical wards,
12 and medical wards. These observations give insight in the implementation of self-
13 administration on different types of wards and their patients who would self-administer
14 medication during hospitalization ⁵.
15

16
17 When implementing self-administration of medication in hospital, some barriers should be
18 overcome. Due to hospital admission, patients will receive medication from the current
19 hospital formulary ⁶. This might result in patients receiving other types or brands of
20 medication. From the study results it is not possible to conclude whether this might be a major
21 obstacle for implementing safe self-administration of medication. Nevertheless, it has to be
22 considered how to tackle problems concerning recognisability of medication. This might be
23 an opportunity to strengthen a multi-disciplinary **team approach** to achieve better and safer
24 medication management in consultation with the patient ¹⁴. On top of this, previous literature
25 already mentioned medication shortages in hospital pharmacies, which have a significant
26 influence on medication management ¹⁵.
27

28
29 When allowing patients to self-administer medication, the current routines of medication
30 management will change. These changes and differences compared to administration of
31 medication by nurses should be well described; protocols or procedures for self-
32 administration of medication could enhance clarity on both the process and the role of every
33 stakeholder (patient, nurse, practitioner, hospital pharmacist). In order to realize these
34 protocols, it is recommended to question patients, nurses, practitioners, and hospital
35 pharmacists in a qualitative study concerning their opinions on self-administration of
36 medication, possible barriers or facilitators within their organisation or ward. Afterwards, a
37 protocol could be developed and tested for validation in daily practice. As this study showed,
38 important aspects which should be included in a self-administration of medication protocol
39 consist of (1) a tool to screen patients' competences before allowing them to self-administer,
40 (2) a monitoring tool to monitor the intake of self-administered medication, (3) a support tool
41 to both support patients while self-administering (e.g. provide education on medication
42 preparation or intake), and health care providers (e.g. additional information on medication or
43 how to educate patients). When testing and validating a self-administration of medication
44 protocol, we should try to investigate how to overcome any organizational restraints in order
45 to improve patients care, without jeopardizing the patient safety.
46
47

48 Implementing self-administration of medication implies that patients need to be hospitalized
49 for a sufficiently long period of time. At first, there will be time needed to assess the patients'
50 capability and willingness to self-administer. Secondly, the process of self-administration
51 should be started, medication should be prepared, patients might need to be educated
52 concerning their (newly prescribed) medication. Thirdly, patients should be monitored while
53 self-administering, in order to be able to assess their actual abilities and -if needed- provide
54 interventions to improve adherence or medication knowledge ⁹.
55
56
57
58
59
60

1
2
3 Because of the inclusion of several aspects such as supporting, screening, monitoring and
4 empowering patients, the term self-administration of medication does not fully cover all these
5 aspects. Therefore, it is suggested to install the term self-management of medication in
6 hospital, which tries to define a broader range of aspects which need to be looked into when
7 self-administering medication in hospital.
8
9

10 Strengths and limitations

11
12 A strength of this study was the random inclusion of several wards in two university and one
13 general hospital. Due to this sample, a diversity of patients were included in the study sample.
14 Also, a random inclusion of surgical, medical, geriatric and rehabilitation wards resulted in
15 attitudes from different types of patients hospitalized for different types of medical
16 backgrounds.
17

18 Despite including a very diverse sample, the total number of participating patients was rather
19 low. It is not possible to make statements concerning the willingness and attitude of all
20 hospitalized patients towards self-administration of medication. The main reason for this is
21 that 29% of the eligible patients did not participate in the study due to the severity of their
22 illnesses. Therefore, the results of this study reflected the willingness of the healthier or fitter
23 rather than the acutely or severely ill hospitalized patients. Also, because of the use of a
24 questionnaire, it could have been more likely that only patients with a more positive attitude
25 participated in the study.
26

27 On the other hand, as the findings of our study confirm previous findings in international
28 qualitative studies we can assume they are generalizable for this type of hospitalized patients
29 internationally.
30

31 Conclusion

32
33 The majority of patients were very positive towards self-administration of medication, and
34 they were definitely willing to effectively self-administer their medication in hospital. This
35 positive attitude will facilitate the implementation of self-administration of medication. The
36 stated prerequisites such as a motivated patient, and a regular evaluation of the patients'
37 abilities should be considered before allowing patients to self-administer medication in
38 hospital. Patients acknowledged some positive benefits such as increased autonomy,
39 independence, and knowledge on their medication. They were not worried about jeopardizing
40 the safety of others, nor were they worried about their own safety when self-administering
41 medication in hospital. In future research, it is important to implement self-administration of
42 medication in hospital with the use of a well-designed and validated protocol, and to study
43 outcomes such as patient satisfaction, knowledge, medication errors, and adherence after
44 discharge in order to objectively investigate the impact of self-administration of medication.
45
46
47

48 Acknowledgements

49 /
50

51 Funding

Research for this paper was financially supported by the Thomas More University College.

References

1. Parnell MA. Medicines at the bedside. *The American journal of nursing*. 1959; 59: 1417-8.
2. Wright J, Emerson A, Stephens M and Lennan E. Hospital inpatient self-administration of medicine programmes: a critical literature review. *Pharmacy world & science : PWS*. 2006; 28: 140-51.
3. Richardson SJ, Brooks HL, Bramley G and Coleman JJ. Evaluating the effectiveness of self-administration of medication (SAM) schemes in the hospital setting: a systematic review of the literature. *PloS one*. 2014; 9: e113912.
4. Deeks PA and Byatt K. Are patients who self-administer their medicines in hospital more satisfied with their care? *Journal of advanced nursing*. 2000; 31: 395-400.
5. Vanwesemael T, Van Rompaey B, Petrovic M, Boussery K and Dilles T. SelfMED: Self-Administration of Medication in Hospital: A Prevalence Study in Flanders, Belgium. *Journal of nursing scholarship : an official publication of Sigma Theta Tau International Honor Society of Nursing*. 2017.
6. Royal decree setting out the standards which hospital pharmacies must meet to be authorized. 1991.
7. McLeod M, Ahmed Z, Barber N and Franklin BD. A national survey of inpatient medication systems in English NHS hospitals. *BMC health services research*. 2014; 14: 93.
8. Manias E, Beanland C, Riley R and Baker L. Self-administration of medication in hospital: patients' perspectives. *Journal of advanced nursing*. 2004; 46: 194-203.
9. Vanwesemael T, Boussery K, Manias E, Petrovic M, Fraeyman J and Dilles T. Self-management of medication during hospitalisation: Healthcare providers' and patients' perspectives. *Journal of clinical nursing*. 2017.
10. Conn VS, Ruppert TM, Enriquez M and Cooper P. Medication adherence interventions that target subjects with adherence problems: Systematic review and meta-analysis. *Research in social & administrative pharmacy : RSAP*. 2016; 12: 218-46.
11. Eibergen L, Janssen MJA, Blom L and Karapinar-Carkit F. Informational needs and recall of in-hospital medication changes of recently discharged patients. *Research in social & administrative pharmacy : RSAP*. 2017.
12. Anderson J, Manias E, Kusljic S and Finch S. Testing the validity, reliability and utility of the Self-Administration of Medication (SAM) tool in patients undergoing rehabilitation. *Research in social & administrative pharmacy : RSAP*. 2014; 10: 204-16.
13. Manias E, Beanland CJ, Riley RG and Hutchinson AM. Development and validation of the self-administration of medication tool. *The Annals of pharmacotherapy*. 2006; 40: 1064-73.
14. Adhikari R, Tocher J, Smith P, Corcoran J and MacArthur J. A multi-disciplinary approach to medication safety and the implication for nursing education and practice. *Nurse education today*. 2014; 34: 185-90.
15. Preece D and Price R. PS-076 The problem of medicines shortages in hospitals across Europe: The European Association of Hospital Pharmacists (EAHP) Survey. *European Journal of Hospital Pharmacy: Science and Practice*. 2014; 21: A174-A5.