Effects of annual consultations on therapy adherence and self-efficacy in patients in the automatic repeat prescription service

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Abstract

Therapy nonadherence is a major factor in failure of therapy. In comparison therapy adherence results in better treatment outcomes and a higher cost-effectiveness. It is proposed that an annual consultation for patients making use of the repeat prescription service (RPS) will improve therapy adherence and self-efficacy. This study aimed to assess the impact of annual consultations on medication adherence and self-efficacy among patients utilizing the repeat prescription service (RPS). Statin users in the RPS were evaluated using the Medication Adherence Report Scale (MARS) and the Medication Understanding and Use Self-efficacy (MUSE) at baseline and six weeks post-consultation. The results indicated that while annual consultations did not yield statistically significant effects on therapy adherence and self-efficacy, they offered valuable insights into potential areas for exploration to optimize adherence and self-efficacy during annual consultations.

The likelihood of a good treatment outcome is nearly three times higher in adherent patients in comparison to nonadherent patients (1). This is evident in the observation made in patients with atherosclerotic cardiovascular diseases treated with statins. Within these patients nonadherent patients were at a significantly higher risk of mortality in comparison to adherent patients(2). This is not surprising since hypercholesteremia has the highest attributable risk for atherosclerotic cardiovascular diseases amongst risk factors such as co-morbidity, psycho-social factors and environmental factors (3). However, despite the negative treatment outcome related to nonadherence, adherence to statins has been estimated at 61.5% after one year and even decreases to 46.5% after two years (4). The significance of improving adherence to statins cannot be overstated, as it directly impacts the effectiveness of the treatment.

In addition to the loss in health-benefit, therapy nonadherence has a negative impact on the cost-effectiveness of treatments. The expenses for treatment remain, despite a decrease in effectiveness. A cost-effectiveness analysis has been carried out to evaluate adherence to statins. In this scenario adherence as opposed to nonadherence would result in an additional 9.500 euros per quality adjusted life year (QALY). The costs increase because of the costs of the statins and intervention costs. However, an increase in health is achieved. The additional beforementioned costs of adherence are below the predefined acceptable willingness-to-pay threshold of 20.000 euros for this specific scenario. This also means that within statin treatment financial space exists to improve adherence (5). This idea is supported by the cost-effectiveness analysis of the improvement of lipid-lowering therapy by Vegter et al. (6). This emphasizes the necessity for improvement of adherence again regarding cost-effectiveness.

It is proposed that implementation of an annual consultation for patients in the repeat prescription service (RPS) would improve therapy-adherence within this population. The repeat prescription service offers a means through which a prescription can be issued up to a year in total. The pharmacy can directly request

the prescription from the prescriber. The annual consultation is a 15-to-20-minute consultation that is carried out utilizing the TRIAGE tool. This instrument offers a set of questions and a few follow-ups to seek out problems and offer solutions (7). The consultation covers correct use of medication, adverse effects, and relevant annual check-ups. This instrument includes several questions that are meant to trace out nonadherence.

As beforementioned this consultation will be conducted in patients in the RPS. This service offers the possibility for medication to be automatically dispensed up to every three months. The pharmacy directly requests a valid prescription from the prescriber and relieves the patient of this task. This service allows for the monitoring of medication collection, as any unclaimed medication will remain in the possession of the pharmacy. Thus, providing a direct means to monitor adherence. Collection of medication can be tracked through this service because uncollected medication will remain in the pharmacy. However, no exact information is available about adherence after collection of medication, and this is of interest. An annual consultation would also offer an opportunity to review various other aspects regarding the patients' health such as the patients' understanding regarding their health.

To assess the effects of an annual consultation this study was carried out. The effects of the annual consultation on the scores of the Medication Adherence Report Scale (MARS) and the Medication Understanding and Use Self-efficacy (MUSE) were measured. Thereby assessing the effect on adherence and self-efficacy of understanding and using prescription medication. The expectation was to see an increase in adherence and self-efficacy

within patients that had a lowered adherence or self-efficacy at baseline.

Method
This study investigated the effects of an annual consultation on therapy-adherence and self-efficacy in statin patients in the RPS. This was done by assessing patients scores on the MARS for therapy adherence and the MUSE for self-efficacy before and six weeks after an annual consultation.

Study Population
Study subjects were recruited from community pharmacies in The Netherlands from the regions Vleuten/Leidsche Rijn and Leiden/Alphen aan den Rijn. Eligible patients were in the RPS and were receiving treatment with a statin. It was calculated that

Subject recruitment
Patients that met the inclusion criteria were invited during an annual consultation to partake in the research. In certain pharmacies, only patients meeting the inclusion criteria were offered an annual consultation during the course of this research. These individuals were sent an email invitation containing a link to an agenda where they could schedule their appointment. Alternatively, patients were contacted by telephone to extend the invitation for an annual consultation.
These individual either received an invitation via email, granting them access to an agenda where they could schedule their appointment. Alternatively, patients were contacted via telephone to extend the invitation for an annual consultation.

Assessment adherence
The Medication Adherence Report Scale 5 (MARS-5) offers a validated method for assessment of therapy adherence. The questionnaire consists of five statements covering both intentional and unintentional non-adherence (8). Topics

covered in this questionnaire are: 'forgetfulness', 'dosage adjustment', 'stopping treatment', 'skipping dosages' and 'taking less than prescribed'. The statements can be rated on a five-point likert scale with corresponding scores: 'always = 1', 'often= 2', 'sometimes = 3', 'rarely= 4' and 'never = 5'. The outcome of the MARS is a score between 5-25 and a score below 23 indicates non-adherence (9). The MARS-5 questionnaire is included in the appendix.

Assessment self-efficacy

The patients' self-efficacy was evaluated through the Medication Understanding and Use Self-efficacy (MUSE) (10). As unintentional nonadherence occurs when the patients want to adhere but patients' capacities and/or resources are lacking. Studying the patients' self-efficacy will also offer insight into which approach will be most suitable. The questionnaire consists of eight statements assessing the patients' understanding and capacities in relation to their medication. The statements can be rated on a five-point likert scale with corresponding scores ranging from 1-5. The outcome of this questionnaire is a score between 8-32. The MUSE is included in the appendix.

Procedure

Both questionnaires were administered before and around six weeks after the annual consultation took place. Before the annual consultation patients filled in the questionnaire on location on either an iPad or a desktop computer. After six weeks participants received an invitation per e-mail to fill in the questionnaires for a second time. Subjects signed an informed consent before filling in the questionnaire the first time. The informed consent form was saved in the patient file.

Statistical methods

The MARS data was tested on a dichotomous scale with a cut-off point set below 23 with a McNemar test. Each individual statement from the MARS was analyzed on a continuous scale through a paired t-test. A paired t-test was also conducted to test the data derived from the MUSE. All the data was analyzed in SPSS statistics 29.

Results
Participants characteristics
A cohort comprising 57 individuals of adult age (male= 39, female=18) were enrolled in the study. A total of 15 subjects were lost to follow up despite efforts to reduce this through regular communication and follow-up attempts.

Treatment adherence
Pre- and post-consultation scores on the MARS-5-questionnaire were collected to evaluate any changes in therapy adherence. The mean pre-consultation score was found to be 24.2 (SD = 1.4) and the mean post-consultation score was 24.3 (SD = 0.9). As depicted in table 1, 3 individuals were non-adherent before the consultation, while 54 were adherent. Following the consultation, 2 individuals remained non-adherent, whereas 55 individuals were adherent. The McNemar statistic yielded a p-value of 1.0, indicating insignificance in the difference observed within paired proportions.

*Table 1. Therapy adherence before and after annual consultation**

| | | Adherence before annual consultation | | |
		No	Yes	Total
Adherence after annual consultation	No	1	1	2
	Yes	2	53	55
Total		3	54	57

* p>0.05

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Table 2. Paired Samples Test on Individual Statements of the Medication Adherence Report Scale (MARS)

	Mean difference	95% Confidence Interval of the Difference		Two-Sided p
		Lower	Upper	
Forgetfulness	.035	-.177	.106	.621
Dosage adjustment	-.018	-.044	.079	.568
Stopping treatment	-.105	.009	.202	.033
Skipping dosages	.018	-.155	.120	.799
Taking less than prescribed	.088	-.213	.038	.168

Table 3. Paired Samples Test on Individual Statements of the Medication Understanding and Use Self-efficacy (MUSE)

	Mean difference	95% Confidence Interval of the Difference		Two-Sided p
		Lower	Upper	
Timely Medication Adherence Ability	-0.140	-.302	.022	.088
Remembering	0.035	-.131	.201	.647
Planning intake	-0.035	-.147	.077	.532
Using daily	.053	-.084	.189	0.443
Easy contact prescriber and/or pharmacy	.000	-.150	.150	1.000
Understanding instruction prescriber and/or pharmacy	-0.105	-.269	.059	0.204
Understanding instruction packaging	-0.070	-.243	.103	0.419
Abilty to gather information	-0.105	-.244	.034	.135

Table 2 presents the results of the paired samples test. Among the variables examined, "Stopping treatment" yielded a statistically significant mean difference (p = 0.033, two-sided) of 0.109. This suggests that there is a significant difference in adherence behavior related to stopping treatment. However, for the other variables ("Forgetfulness," "Dosage adjustment," "Skipping dosages," and "Taking less than prescribed"), the mean differences were not statistically significant (p > 0.05), indicating no significant change in adherence behavior.

Self-efficacy
Pre- and post-consultation scores on the MUSE-questionnaire were collected to evaluate any changes in self-efficacy. The mean pre-consultation score was found to be 30.3 (SD = 2.8) and the mean post-consultation score was 29.9 (SD = 3.4). Table 3 presents the outcomes derived from the paired t-test conducted on individually assessed statements from the MUSE. These results indicate insignificant differences in all the variables.

Discussion
The aim of this study was to assess the impact of an annual consultation on therapy adherence and self-efficacy among individuals in the repeat prescription service. Adherence to prescribed therapies is crucial for achieving optimal health outcomes, and self-efficacy plays a significant role in influencing an individual's ability to adhere to treatment recommendations. Therefore, understanding the effectiveness of interventions aimed at improving adherence and self-efficacy is of importance in healthcare research.
The hypothesis proposed that regular consultations would facilitate improvements in therapy adherence and the strengthening of self-efficacy among

participants over time, particularly in cases where patients exhibited initial non-adherence.

However, several factors need to be considered in respect to the findings of this study. The first point to consider is that the sample size used in the study was small. Despite the small sample size, it accurately represented the patients who responded to an invitation for an annual consultation. However, it might have lent greater statistical power to the study.'It is also important to note that the sample included may not be the most representative of nonadherence in the RPS. One of the inclusion criteria was that subjects had to have an appointment for an annual consultation at the time of inclusion, indicating a certain level of involvement with their medication. Meaning this introduced a selection bias. Patients who are nonadherent, either intentionally or unintenionally in, are less likely to respond to an invitation for a consultation. Additionally, the subjects who were willing to participate in the study also had a certain level of literacy. The statements in both questionnaires were to be read and assessed by participants. It has been suggested that literacy has an association with adherence, however findings on this subject are mixed (11). Taking this into account the results of this study may not accurately represent these specific groups of patients.

A proportion of participants were lost to follow-up during the course of the study. Efforts were made to mitigate this challenge through regular communication and follow-up attempts; however, it is important to acknowledge the potential implications of participant withdrawal.
In this particular scenario, the patients who withdrew didn't display any systematic differences compared to those who

remained in the study. As a result, the portion of participants who continued offered a similarly representative sample, thereby alleviating concerns about biased findings or limited generalizability due to loss to follow-up.

The second consideration applies to the validity of the measurement. While there is a protocol in place for the annual consultations, the execution of each individual consultation varies. Meaning that the focus of some consultations primarily revolved around adverse effects and proper usage of medication, such as taking certain statins at night. Due to this lack of emphasis on therapy adherence, the issue of nonadherence may have been overlooked in these cases.

The study design also introduced several biases other than the beforementioned selection bias. The questionnaire is administered before the annual consultation, meaning that the subjects might be inclined to fill in socially desired answers. The questionnaire consisted of statements, which means the subjects may have been inclined to select a more positive response option without thoroughly considering the content. This might have also been amplified by the presence of the interviewer, as subjects may have experienced pressure to complete the questionnaire quickly. This provides possible rationale for the observed decrease in mean scores on the MUSE, as subject might be reluctant to be truthful about their self-efficacy due to shame. With these considerations in mind, it warrants a more careful examination of the results.
Firstly, the influence of the annual consultation on therapy adherence was assessed using the MARS-5 questionnaire. Dichotomized analysis revealed that 55 out of 57 patients were adherent by the end of

the study, with two transitioning from non-adherence to adherence. These findings highlight the overall positive impact of the intervention on adherence. Furthermore, when analyzed with a paired t-test, no significant outcomes were observed, indicating that the intervention did not lead to statistically significant changes in four of the five areas assessed. Possible reasons for the lack of significant outcomes could include the small sample size at the outset of the study, which may have limited statistical power, and the subjective nature of the questionnaire used for assessment, which could introduce variability in responses. A significant increase in the stopping of treatment was observed, however due to the closed nature of the questionnaire it is not evident whether this was intentional or unintentional. A potential outcome of an annual consultation could be intended stopping or changing of statin treatment, for example in old age and limited life expectancy. Secondly, the influence of the annual consultation on self-efficacy was assessed using the MUSE questionnaire. The paired t-test yielded no significant results, with identical rationale to the insignificant results found on effects on adherence.

Despite not attaining statistical significance, the observed trend towards adherent behavior in the MARS results holds practical significance. It showcases that an annual consultation is exerting a positive influence on therapy adherence among participants. Furthermore, this research has contributed valuable insights for the optimization of the annual consultation's design regarding adherence and self-efficacy. An initial insight is that the MARS offers a validated method to assess non-adherence, it does not differentiate the degree of non-adherence. Four questions of the MARS are aimed at

intentional non-adherence. Subjects that score very low on the MARS might not benefit from the intervention in the same way subjects that have a slightly lowered score. The assumption can be made that subjects with very low scores are actively choosing to be non-adherent. To offer a more tailored intervention in the future it would be interesting to study the influence of beliefs about medication on the MARS score and to assess whether an annual consultation influences the beliefs and thereby improves adherence. Moreover, the underlying cause is of interest here. It would be interesting to find out why subjects choose to be non-adherent and assess whether an annual consultation might change that. Additionally, this study provides insight into therapy adherence, but further investigation into the underlying causes of nonadherence is warranted. For example, instead of forgetfulness, it would be beneficial to explore the root cause of forgetfulness, which could inform the development of more personalized interventions such as personalized reminders for medication intake. Regarding self-efficacy, conducting interviews with subjects exhibiting lower levels of self-efficacy would offer valuable insights into understanding the underlying causes.

In conclusion, this research provides valuable insights into the optimization of the annual consultation process, evidenced by the observed trend towards improved adherence and the proposed exploration of strategies to address specific scenarios related to adherence and self-efficacy. Additionally, it underscores the significance of prioritizing patient engagement and support within the repeat prescription service, emphasizing the need for tailored interventions to enhance medication adherence and patient outcomes.

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Appendix

MARS-vragenlijst

De vragen hieronder gaan alleen over het gebruik van uw **statine (cholesterolverlager**):

Kruis aan welk bolletje voor u van toepassing is	Altijd (1)	Vaak (2)	Soms (3)	Zelden (4)	Nooit (5)
Ik vergeet mijn medicijnen te nemen	O	O	O	O	O
Ik wijzig de dosering van mijn medicijnen	O	O	O	O	O
Ik stop een tijdje met het innemen van mijn medicijnen	O	O	O	O	O
Ik beslis een inname over te slaan	O	O	O	O	O
Ik neem minder dan voorgeschreven	O	O	O	O	O

MUSE-vragenlijst

De vragen gaan over het gebruik van **al uw** medicijnen:

Kruis aan welk bolletje voor u van toepassing is	Helemaal niet eens (1)	Niet eens (2)	Eens (3)	Helemaal eens (4)
Het lukt mij om mijn medicijnen op tijd te gebruiken	O	O	O	O
Het lukt mij te onthouden alle medicijnen in te nemen	O	O	O	O
Het lukt mij een planning te maken om mijn medicijnen elke dag in te nemen	O	O	O	O
Het lukt mij om mijn medicijnen elke dag in te nemen	O	O	O	O
Ik kan eenvoudig de apotheek of arts om informatie over mijn medicijnen vragen	O	O	O	O
Ik begrijp de instructies van mijn apotheker of arts over mijn medicijnen	O	O	O	O
Ik begrijp de instructies op de verpakking van mijn medicijnen	O	O	O	O
Ik ben in staat alle mogelijke informatie over mijn medicijnen te krijgen	O	O	O	O