

## Review Article

# A Review on Medication Synchronization Programs in Community Pharmacies to Improve Medication Adherence

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## Abstract

Adherence to the prescribed medications plays an important role in treatment of chronic diseases. Hypertension, Ischemic heart diseases, Diabetes mellitus, Dyslipidaemia's are major health challenges of 21<sup>st</sup> Century and are more expensive. A total 79% of Projected deaths are caused due to chronic diseases in developing countries. Non adherence to prescribed medications is one of major health threat worldwide. Patients who are on chronic diseases are often visits multiple health care practioners, numerous pharmacies, and who take multiple drugs results in medication non-adherence. The new primary care models suggest that there is no promotion of close physician-patient-pharmacist relationships. Training for the treatment of chronic diseases is seldom satisfactory and there is inadequate consistency and communication between health care providers. Among health care profession community pharmacist are the ideal position to assist the management of patients with chronic disease. The Synchronization services are offered by several community pharmacies to improve medication adherence. These programs work by overcoming the barriers of medication non adherence by refilling their prescription in their single visits. Although there are Numerous medication synchronization programs are available in community pharmacies effectiveness of medication synchronization programs are confined to its type synchronization programs implemented.

**Key words:** Medication synchronization, Adherence, Medication, Community Pharmacies

## Introduction

Health care practitioners describes the definition of medication adherence in their own way. The exact definition of medication adherence is lacking. It is defined as the extent to which patient takes the medication as prescribed by the health care practitioner.<sup>1</sup> Non- adherence to prescribed medications occurs in 50% of patients in chronic diseases which leads to increase in

emergency visits, hospitalization stay, medical cost. As per world Health organisation chronic diseases kills 38 million people globally every year. Over 20% of Indian populations suffers from chronic diseases which are estimated to cost \$6.2 trillion during the period of 2012-2030<sup>42</sup>. 70-90% of the population burden of diabetes, hypertension and obesity are having higher social economic status<sup>44</sup>. Patient with chronic diseases often prescribed with multiple drugs to treat their conditions, prevent complications, and to improve overall health related quality of life. Elderly populations are at higher risk for chronic disease where they find difficulty in taking the medications and following the medications as prescribed by the doctors.<sup>2</sup> chronic diseases patients may feel burden because of increase in visits to the pharmacy to pick up their medications...<sup>3</sup> Nonadherence is attributed to multiple factors including like social, economic,

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therapy- related, patient- related, condition- related, and health system factors, & Polypharmacy. Community Pharmacist are in better position to improve medication adherence by providing better patient care. Medication synchronization program has shown better impact on medication adherence.<sup>4</sup> Medication synchronization programs are implemented and have grown very rapidly. Medication synchronization program works by refilling of prescription as prescribed by medical practitioners in their single visits, which results in convenience for the patients to take their medications<sup>5</sup>. Studies have shown that the rate of medication adherence was increased to 2-6 times when it compared with patients who are managing their disease by own.<sup>6-7</sup>.

### **Review of Research and Development in the Subject**

#### **International status:**

In most of the developed part of the world, pharmacist is in better position to improve medication adherence in chronic diseases. Pharmacist can provide drug therapy training, access to all patient's medication refill data. Medication synchronization programs is one of the popular strategies to improve medication adherence. A study conducted by **Jalpa A Doshi et al** mentioned that refilling of prescribed medication using medication synchronization program using health insurance program through mail order community pharmacy results in increase medication adherence to antihypertensive, lipid lowering and antidiabetic agents. A study conducted by **Matthew J et al** suggests that pharmacist was positive about medication synchronization programs, although some negative views were present. **Chayla Stanton Robinson et al** emphasis more about patient specific barriers and pharmacist interventions to improve medication adherence. This study showed that 37.9% were adherent at 90day of follow-up and 69% were adherent at 180days of follow-up. Hence More research is needed to be carried out to understand the barriers and facilitators to how medication synchronization programs are implemented to achieve better outcomes.

#### **National Status**

In India community pharmacy practice is predominantly confined to trade. Majority of registered pharmacists are with diploma in pharmacy qualification and their knowledge regarding professional services is very limited. Pharmacy Council of India and respective state pharmacy councils are providing educational motivation to change their trader attitude. In our health care system, more than 80% of the prescriptions are filled by the community pharmacist. The high number of prescriptions especially to chronic diseases leads to medication non adherence. Hence community pharmacist can sensitize and enroll the patients in medication synchronization programs offers in community pharmacy to prevent medication non-adherence. Community Pharmacy based programs are used to enhance medication adherence by incorporating medication synchronization programs. Currently limited available evidences suggestive of medication synchronization might improve patient's health outcomes in chronic diseases hence more research need to be carried out.

#### **Medication synchronization services:**

Medication synchronization program defines as synchronized, same day, filling and refilling of all chronic disease medications.<sup>8</sup> Medication synchronization services works by aligning of prescriptions, refilling the quantity of medications which are prescribed for the chronic diseases. These programs are getting benefited for the patients who are on chronic diseases so that they will refill their medications on same day.<sup>9</sup> The chosen date becomes the patient pick-up date.<sup>10</sup> A week before that a patient's medications are due, a pharmacy team member calls the patient to determine if changes are made in patient's treatments such as new or changed medications or hospitalizations. Subsequently, based on the discussion, the pharmacy team member fills all of the medications as appropriate.<sup>11</sup> In order to achieve synchronization, some prescriptions will have to be filled for smaller quantities for the first 1-3 months.<sup>12</sup> In day today practice Pharmacist are assisting the patients

in adhering to their prescribed Medications.<sup>13</sup> Several community pharmacies are providing synchronization services to improve medication adherence programs such as Appointment based model, script your future, simply my Meds, Refilling using Auto- refilling, refilling using batching, Refilling using grouping, CVS script sync, patient counselling, pill reminders etc<sup>14</sup>. These services can help patients by remembering to take their medications in a timely manner and to refill chronic medications regularly Through patient counselling. Pharmacist are in better position in identifying barriers to nonadherence by providing product information leaflets and educating the patients on their diseases and drugs. Community pharmacists plays an important role on patients in their personalized ways to change a patient's behaviour and to improved overall health quality of life of patients<sup>15</sup>. These programs run by collecting patients' past prescribed data from insurance claims to determine their adherence rate which help them achieving higher adherence through patient counselling, providing additional materials which could help by overcoming their specific barriers to nonadherence<sup>16</sup> The automatic refill programs identify only irregular filing of prescriptions and it will not address the patient specific barrier for medication non adherence Hence there is a need for community-based medication synchronization programs to enhance the medication adherence.<sup>17</sup> Synchronization services allows the pharmacist to check all of medications at one time allowing for more thorough and effective therapeutic check. Refills and/or therapeutic recommendations are sent to the physician and any issues are resolved before the patient picks up the medications.<sup>18</sup> The result is a proactive workflow which reduces the patient's need to call the pharmacy or wait for extended periods of time while team members resolve last minute issues Medication synchronization can improve both patient satisfaction and pharmacy operations.<sup>19</sup> By helping to improve patient adherence and pharmacy efficiency, the pharmacy team is able to provide a higher level of care. The proactive approach allows patients to feel individually cared for, increasing their confidence in the pharmacy and in optimizing their health

### **Advantages:**

- 1) Medication synchronization are the way to promote operation effectiveness
- 2) It ensures medication appropriateness to improve patient safety and care
- 3) It improves rapport between pharmacy, patient, physician relationship
- 4) It allows systematic management, organized and prepared patient appointments to facilitate services like medication reviews, immunizations, medication therapy management, patient counselling etc
- 5) Patient satisfaction is one of most crucial part of medication synchronization program.
- 6) It reduces the number of prescription paper works through medication adherence in chronic diseases.

### **Medication synchronization services offering in community pharmacies.**

**1) Appointment based model:** ABM is one of the patient most important patient care centric model, implemented in the community pharmacies to enhance medication adherence and to build efficiency in pharmacy operations. Appointment based model mainly address on patient and provided based barriers Appointment based model works by pharmacy team members from community pharmacies are actively contacting patients prior to their refill dates. Along with their process of refilling prescriptions pharmacy teams' members were also actively involved in educating patients on drug- drug, drug- food interactions, adverse drug reactions, direction for use of medication etc. Appointment based model works by scheduling an appointment to the patients so that patient can visit pharmacy at a scheduled time to refill their prescriptions. Before scheduling an appointment, pharmacy team member should contact the patients to identify any changes are made in their prescriptions or in their treatment regimens. These programs develop the rapport between patients and physicians through patient and physicians co-ordinating relationships to improve medication adherence. Appointment based model and their work process are described below.

- 1) Patient brings new or old refill prescription to the community pharmacy
- 2) Pharmacy team member explains about Appointment based model and its process,

enrolments & procedures. 3) Patient decided to enrol in appointment-based model where he will enquire more about synchronized appointment with pharmacy team members so that patient can pick up their prescription on a single visit. 4) The Pharmacy team member will review patient profile to prepare their medicaments, where he plans for synchronization services such that patient can pick up all of their chronic medications in a single visit. 5) Pharmacy staff will formulate short refilling of prescriptions (short period of time) or long refilling of prescriptions as advised by their physician (for long period of time) which depends up regimens the doctor was prescribed or based on cost of chronic medication... 6) Every month Pharmacy team member will contact the patients one week prior to the appointment date to check the prescription should be refilled or it required any changes in their prescriptions. 7) Pharmacy staffs reviews for the potential changes in patient medication regimen, prepares for prescription and creates package for the patients so that they can pick up their medications as per scheduled time. 8) Every month community pharmacist reviews the prescription order comprehensively to evaluate any changes in prescription or same prescription can be refilled once again so patient can pick up their medication without any disturbances. 9) On the selected day patients visits the pharmacy to collect all of the prescriptions that are prepared. 10) Community Pharmacist are also pro- actively involved in optimizing medication management services, like comprehensives medication history interview, patient counselling which helps the patients by improving in their health care outcomes.<sup>20</sup>

**2) Script your future:** It is one of the most important programs launched in 2011 among general publics by creating awareness campaign about importance of medication adherence co-ordinated and staffed by national consumer league. These programs designed to help patients take back their futures by helping them take their medication as prescribed. It provides tools to manage medicines and their sample questions to help start important conversation for patients, caregivers, and health care professionals<sup>21</sup>

**3) Simplify My Meds:** It's a program which provides tools and training programs to implement the medication synchronization programs for NCPA (Nation community Pharmacist Associations) members. These programs help the pharmacist to consolidate and co-ordinate a patient prescription so that they can re-fill their prescription on a particular time and date in a month, which leads to improving patient medication adherence and change in pharmacy operations. These programs work by improving medication adherence through convenience for synchronizing all of the patient's chronic medications are refilled in a single day of each month. through this service offered by the several community pharmacies' patients will get benefited to improve adherence and also it provides an opportunity for the patients to interact with the community pharmacist to clear all their queries<sup>22</sup>

**4) Refilling using Auto- Refilling:** Pharmacy which have the facilities of Auto- refilling software features and ability to keep electronic record of patient due dates for medications are considered for this type of synchronization programs. Following are the methods that should be considered: 1) Print the auto- refill list at the beginning of each day 2) Review the refill list to ensure all of the patient's medications are included. If a medication is omitted, complete the syncing process as described above to ensure resynchronization. 3). Call the patient in the afternoon or evening to inform them that their medications have come up in our system and they are ready to be picked up from the pharmacy. 4) If patient informs the team member of any changes, this is taken into account and any resynchronization is completed as required.

5) Review the number of refills left for each medication. If this is the last refill, send a refill request to the physician. If refill request is denied inform patients right away to ensure they book an appointment. 6) Process and refill all the medications.



5) **Refilling – Using Batching:** This type of Synchronization Programs usually offers in Pharmacy whose software does not have the auto refill features. or if the pharmacy prefers not to use this feature, medication can be refilled using batch. Following are the methods that should be considered using batching. 1) Complete the synchronization for each patient

2) Determined which day of the month patients' medications will become due and place them into the batch for that respective date. 3) Run the batch each morning and review the batch list to ensure all of the patient's medications are included. If a medication is omitted, complete the syncing process as described above to ensure resynchronization. 4) Complete steps 3-6 times as per auto refill method.

6) **Refilling using Grouping:** This type of Synchronization Programs usually offers in Pharmacy whose software does not allow or prefer not to use the auto refilling or batching methods. Following are the methods that should be considered using Grouping.

1) Complete the synchronization process for each patient. 2) Determine if patients will be receiving a 28- or 84-day supply of their medications. 3) Based on the patient's refill date, determine which week of the month medications are to be refilled. a. For those receiving 28 days, on a calendar, mark the first four weeks of your program as Groups A-D. b. For those receiving 84 days of medication, on a separate calendar, label the first 12 weeks of your program as Groups 1-12. 4) Develop a list of patients in each group based on their refill quantity and date. This will be the master list that staff members can refer to each week when determining who is due for medication refills. Additionally, place a note in each file as to which group each patient falls into for easy reference. 5) Create a binder with sections for each group to organize the required patient information. 6) Using the calendar as a guide, call patients the week

their medications are due to be filled to determine if any changes have been made. 7) Review the patient's medication file and complete any synchronization as required. 8) Process and refill all of the medications. 9) Review the number of refills left for each medication. If this is the last refill, send a refill request to the physician. If refill requests are denied, inform patients right away to ensure they book an appointment<sup>20</sup>

7) **CVS script Sync:** CVS Pharmacy offering medication synchronization services to their patients who are on multiple prescriptions. These programs allow the patients to refill their medications on monthly visits, which is managed their prescription online. It's one of the newer pharmacy services render to the patients and their care givers to refill all of their eligible prescriptions on a monthly basis in CVS Pharmacy. Consumers, patients, patient care takers are eligible to enrol at their local CVS pharmacy. Pharmacist explains about Synchronization programs offering in their pharmacy to the consumers and its importance in managing their chronic diseases, he also explains about barriers of medication non adherence and how to overcome it. This leads to increase in the customer satisfaction, loyalty, increased patients' knowledge about their diseases and their therapies<sup>23</sup>

#### **Technology benefits of medication synchronization programs:**

The American Pharmacist Association (APhA) address that Technology will make it easier for community pharmacies to created and enforced synchronization system. It is one of the important tools to facilitate in development and implementation medication synchronization programs in current pharmacy management systems. This frame work will provide the synchronized tools with automated data so that it gives better patient care through enhancing medication adherence.<sup>43</sup>

**Table 1: Different Medication Synchronization programs offering in community pharmacies to improve medication adherence based on Literature review.**

SL NO	Author Name	Study Design	Objective	Synchronization Programs	Outcomes
1	Jalpa A Doshi <i>et al</i> <sup>22</sup>	Quasi Experiment	Impact of refill synchronization program implemented by nation Insurer	Pharmacy-mail order	Synchronized groups have showed larger Proportion of days covered rate (0.86-0.89), adherence rate to (83% - 86%) as compared to control group.
2	Matthew J Witry <i>et al</i> <sup>24</sup>	Cross section survey	Assess the community pharmacist attitude on medication synchronization programs	A Post card system	45% of all pharmacies reported to have medication synchronization. Pharmacist strongly agreed that program would benefit the pharmacy financially (5.25 SD= 1.41) that would increase the opportunities to interact with patients (4.71SD= 1.45) (P<0.001).
3	Chayla Stanton-Robinson <i>et al</i> <sup>23</sup>	A Quality improvement design	Assess the patient specific barriers and pharmacist intervention to improve medication adherence	Appointment based model	37.9% were adherent at 90-day follow-up, followed by 69% were adherent at 180days follow-up. A significant increase in the total number of patients achieving adherence occurred at 90 days after baseline (P < 0.001) and at 180 days after baseline (P< 0.001) Study concluded that Pharmacist plays an important role in identifying and addressing patient barrier
4	Kristen L. DiDonato <i>et al</i> <sup>25</sup>	Randomized controlled trail	To examine the effect of medication synchronization program or education program on health outcomes	Mail order system	Synchronization program showed positive change of 40% hypertension knowledge questions. Were as control group showed positive change of 20%. Educations group experienced a 27.1% increase in correct identification of appropriate amount of exercise needed for BP lowering (p<0.001). Significant intervention is needed to impact adherence aside from ensuring that patients have their medication on hand.
5	Alexis A. Krumme <i>et al</i> <sup>26</sup>	Mixed methods	To identify the prevalence, scope, and characteristics existing programs	Telephonic interviews	One observation study, 4 full length studies were evaluating an adherence outcome measured adherence to antihypertensive, hyper lipidemic, and/or oral hypoglycemic therapy. 2 peer review article were only one to conduct statistical testing of results, both finding significantly higher adherence in synched patients compared with usual care, with up to 6-fold greater odds of patients being fully adherent. Other studies demonstrated improved adherence or persistence due to synchronization with different lengths of follow-up.
6	Datar M <i>et al</i> <sup>27</sup>	Retrospectives cohort analysis.	Impact of programs on chronic medication adherence and health care cost	Medicaid claims	Average medical cost was significantly reduced from 584\$ to 420\$. The new service was not only associated with improved medication adherence, but also with decreased medical expenditures among chronic patients.

**Cont... Table 1: Different Medication Synchronization programs offering in community pharmacies to improve medication adherence based on Literature review.**

7	Anthony Pattin <i>et al</i> <sup>28</sup>	Prospective cohort study	Association between participation in appointment-based model and blood pressure levels among antihypertensive medications	Appointment based model	35 participants among each group showed estimated SD of 14mmHg. The proposed sample size will provide approximately 80% power to detect a difference as small as 9.5 mmHg with. Statistical significance 0.5. This study shows that appointment-based model study participants are having significant reduction in blood pressure
8	Emily Ghassemiet al <sup>30</sup>	Multi centric pilot cohort study	To compare the antiviral therapy with insured HIV infected adult out patient enrolled and not enrolled in medication synchronization program	Script your future	The mean PDC were 96 ± 9% and 71 ± 21% in the medication synchronization and control groups, respectively (P < 0.001). The medication synchronization group was significantly more likely to be adherent than the control group (OR 10.67, 95% CI 2.63e43.31). at the end of the study completion 83.3% and 64.7%. had an undetectable viral load on medication synchronization and control groups(p=0.34) was not significant. The study shows that patient enrolled in synchronization program significantly improve ART adherence in a population infected out patients.
9	Rebecca M. Fitzpatrick et al <sup>31</sup>	Retrospective chat analysis	To identify drug therapy problems (DTPs) associated with patients enrolled in appointment-based model for medication synchronization program,	Appointment based model	The most common intervention documented was to address medication adherence, followed by recommending a vaccination. Medication. The regression. explained 10.2% of the variation in the number of DTPs identified. Age and the total number of medications synchronized had significant positive associations with DTPs identified Synchronization program involved a clinical pharmacist routinely assessing the patient drug therapy lead to identification of significant drug therapy problems.
10	David Holdford et al <sup>32</sup>	Retrospective cohort study	To compare the impact of community pharmacist chain ABMS program on medication adherence with persistence users who are on chronic diseases which are not enrolled for synchronization program	Appointment based model	Adherence was measured using proportion of days covered and patients were considered adherent with a PDC at least 0.8. Mean PDCs for the comparison group ranged from 0.57 to 0.71, while those for patients in the ABMS program ranged from 0.73 to 0.91 Proportion of days covered score for appointment-based model synchronization patients shows statistically significant among synchronized patients than not enrolled patients.

**Discussion**

**Current Scenario:**

This comprehensive review identified 10 research studies relevant to medication synchronization programs offering in community pharmacies to improve

medication adherence in chronic diseases among elderly population <sup>22-30</sup>. limited available evidences suggestive of medication synchronization programs might improve patient’s health outcomes in chronic diseases. Hence more research needs to carried out to understand better outcomes among elderly populations. More over most

of the studies are conducted in different locations of United States of America, we could not able to identify sufficient evidences other than United States of America. Medication synchronization programs in Community Pharmacies are yet to be implemented and established among Indian population. Majority of registered pharmacists are with diploma in pharmacy qualification and their knowledge regarding professional services are very limited. Practicing pharmacist lacks proper techniques to improve medication adherence hence Pharmacy Council of India and respective state pharmacy councils are providing educational interventions like continuing professional development programs, seminars, webinars, preparing books and manuals to update their knowledge, skills, techniques to increase medication adherence.

#### **Effectiveness of Medication synchronization program:**

Medication synchronization program constitutes multiple methods that address patient needs and manage the continuity of care in patients receiving pharmacotherapy for chronic diseases. Literature emphasises that these programs are effective in managing clinical and economic outcomes for patients at various stages. Jalpa A Doshi *et al*<sup>22</sup> emphasis on pharmacy mail order programme effectively showed larger proportion of days covered and adherence rate in synchronized group. However, this programme was unable to demonstrate the information on common roots of medication non-adherence (eg forgetting of dose, or ambivalence) among the patients through this system. David Holdford *et al*<sup>32</sup> addressed that the synchronized patient appointment-based model showed a greater proportion of days covered than the patient not enrolled, but this study has some limitations associated with adherence and persistence measures. Emily Ghassemiet *al*<sup>30</sup> demonstrates that script of your future program had a positive impact on patient enrolled in the synchronization program as compared to non-enrolled patients. Synchronized patients have significantly improved ART adherence than non-infected outpatients, but this study does not evaluate patient satisfaction among synchronized

groups. Alexis A. Krumme *et al*<sup>26</sup> conducted telephonic interviews states that antihypertensive, hyper lipidemic, and oral hypoglycaemic therapy was found to be effective in increasing the medication adherence among synchronized patients as compared with usual care, but this study states that under report of current number of programs and enrolled patients. Anthony Pattin *et al*<sup>28</sup> show that participants in appointment-based study model have significant blood pressure reduction, but this study involves lack of randomization at the point of entry into the study. Compared to other programs, the appointment-based model was found to be better medication synchronization program as per the literature finding.

#### **Applicability of Medication Synchronization program in Indian Health Care System:**

Although literature contains studies and pilot programs that demonstrated medication synchronization programs can increase in adherence measured by proportion of days covered, decreased overall health care cost, decreased in hospitalization stay, and emergency visits future research is required.<sup>31</sup> However, MSP are not implemented in our system it our belief that strict government regulatory frame works will hinder the progress. Since India is a developing country implementing these programs are quite challenging<sup>32</sup>

#### **Barriers for Medication synchronization program.**

Community Pharmacies have included a medication synchronization program in their workflow to improve the quality of pharmacy care and medication adherence. MSP showed decrease in-patient emergency visits, hospitalization stay & address the barriers of medication non-adherence.<sup>33</sup> These programs are well established in most of the developed countries were as among Indian population pharmacy services are lacking<sup>34</sup>. Common perception about community pharmacists are primary limited to trade, but the majority of registered pharmacists are qualified in pharmacy and have limited knowledge of professional system<sup>35</sup> Practising pharmacist does not have proper techniques to improve medication



adherence. However, in most of the developed countries pharmacist will play vital role in providing patient educations to minimize medication non-adherence.<sup>36</sup> Majority of patients are having lack of knowledge about their disease, drug usage and their treatment. Developing and implementing medication synchronization program can be quite challenging.<sup>37-41</sup>

### Conclusion

Medication synchronization programs are the newer pharmacy services implemented to restore the refilling process. It is one of tools to improve medication adherence and decrease over all health care cost. These programs work by aligning of prescriptions, refilling the quantity of medications prescribed for chronic disease on single visits. Although there are Numerous medication synchronization programs are available in community pharmacies to improve medication adherence each MPS has its own pro's and con's. Effectives of medication synchronization programs are confined to the type synchronization programs are implemented. Appointment-based model was found to be better MSP as compared to other programs in community pharmacies as per the literature evidence. Since these programs are well established in most of the developed countries among Indian population pharmacy-based services are lacking. Newer Pharmacy services are yet to be implemented among Indian health care system Developing and implementing MPS in health care system is Quite challenging. This comprehensive review focus on applicability, effectiveness, barrier's, of medication synchronization programs in India.

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