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# Patient-Centric Biomedication Delivery Network

Rushikesh Nale
*MIT ADT UNIVERSITY*
PUNE, India
+919325404957
rushikeshnale07@gmail.com

Kiran Patil
*MIT ADT UNIVERSITY*
PUNE, India
+91 9699149087
patilkiran1663@gmail.com

Aditya Patil
*MIT ADT UNIVERSITY*
PUNE, India
+91 8369272684
patiladitya25725@gmail.com

Dr. Anupama Budhewar
*MIT ADT University*
PUNE, India
+91 9764922888
anupama.budhewar@mituniversity.edu.in

***ABSTRACT*** **- This research presents a novel Medication Reminder System (MRS) designed to enhance patient medication adherence and simplify the doctor-patient interaction. By incorporating a robust alarm system, the MRS eliminates the need for patients to manually track medication dosages and timings. Patients can easily set personalized alarms for multiple medications, including specific dates, times, and descriptions. The system also facilitates efficient communication between patients and doctors, allowing for convenient disease-based doctor searches and direct contact information retrieval. To further support patient health and well-being, the MRS provides access to a comprehensive library of medical articles and healthcare tips. The system's user-friendly interface and intuitive navigation ensure a seamless experience for all users. By offering a cost-effective, time-saving, and hardware-independent solution, the MRS aims to significantly improve medication adherence and overall patient outcomes.**

***Keywords*** **-** Automatic Alarm, Reminder System, Notification System, Medication Adherence, Medicine Scheduler.

## 1. INTRODUCTION

The category of patients involves all human beings-teachers, students, businessmen, housewives, and children, and also all of us have a busy hectic schedule. Today's life is full of responsibilities and stress. So people are prone to diseases of different types and it is our duty to make ourselves stay fit and healthy. If the patient stays at home then he or she might get someone to look after him/her but when one is not at home, is out of the city or state away from home then it is hard for the family members to call them and remind them their dosage timings every time. In our developing and technologically dependent life we totally rely on gadgets, especially smartphones. Today everyone has a smartphone. With this, we get an opportunity to use technology in a better way so that it can be made useful to us. And it plays an important part in our daily life and helps us stay fit in many ways. The remarkable problem is that patients forget to take the proper medicines in the proper proportion and at the proper time. Medication adherence, which refers to the degree or extent to which a patient takes the right medication at the right time according to a doctor's prescription, has recently emerged as a serious issue because many studies have reported that non-adherence may critically affect the patient, thereby raising medical costs [1]. Medication nonadherence is a common, complex, and costly problem that contributes to poor treatment outcomes and consumes healthcare resources [2].So we are introducing an Android application whose objective is to remind the patients of their dosage timings through the Alarm Ringing system so that they can stay fit and healthy.

Through navigation, they can search doctors and hospitals and contact details so that they can easily get proper treatment on time. This application focuses on people who forget to take their medicines on time. It allows users to set an alarm along with the fields of date, time, and medicine description which will allow them to set alarms for multiple medicines at different time intervals. The notification system will send a notification after setting an alarm. The user can activate or deactivate the notification accordingly. It will be sent as an email or message as selected by the user. The patients can search doctors disease-wise and area wise which will provide an easy search facility along with the doctor's contact information, visiting place, and availability time.

Medication reminders help in decreasing medication dispensing errors and wrong dosages. The application is designed on Eclipse. It can be helpful in the defense sector and emergency conditions (accidents) and can spread health care awareness. It is a life-saving, money-saving, and time-saving application that is easy to use and provides a good user interface.

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## 2. FIGURES/CAPTIONS

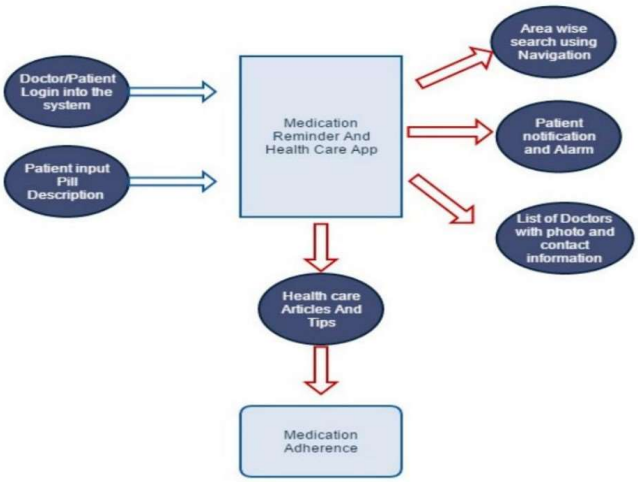



Fig. 2.1 An outline of MRS's proposed work

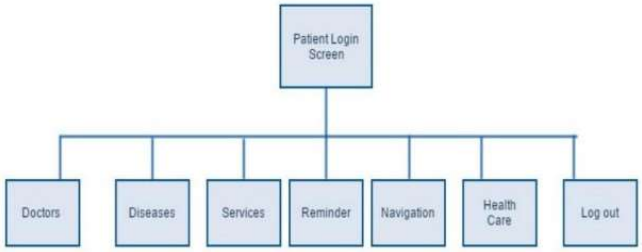



Fig. 2.2 Patient login module

## 3. LITERATURE SURVEY

Many Medication Systems have been developed based on different platforms and concepts. The use of healthcare-related apps is growing but there are many issues related to their functionality.My MediHealth is a medication reminder system for children. It runs on mobile devices such as smartphones, providing user interfaces for configuring medication schedules and user alerts for reminding users about the time and type of medication according to the configured medication schedule.

Some systems use sensors, radio-frequency identification (RFID), or motion detection technologies to ensure that patients actually take their medications. Park et al proposed a medication reminder synchronization system based on data synchronization. It transmits OMA (open mobile alliance) DS (data synchronization) based messages containing the patient's medication data and the device configuration data to a remote manager/medical staff. It also synchronizes data (including medication schedules) modified/generated by this personnel in the medication server.

In the market, there is already the Medicine reminder pro. It is a free application that supports up to 15 reminders. User can select them in either repeating or non-repeating alarm patterns. Any hourly time interval between alarms can be selected, starting from a minimum of 1 hour. At the scheduled time, the application will produce a notification with an alarm, vibration, or LED indication.

MedsLog, an application only for iPhone users, is a very complex application compared to others. The users need to spend much more time with the software to understand its functionalities in a proper manner. The main problem with the system is it has a "consumed by" box where a user is supposed to fill in his username in the provided space. Still, the system shows "no people" [12]. In contrast, the proposed system is very much user-friendly because it is made for people of all ages. So one can utilize the time in using the system rather than wasting the time understanding the software. The users can easily manage their profiles.

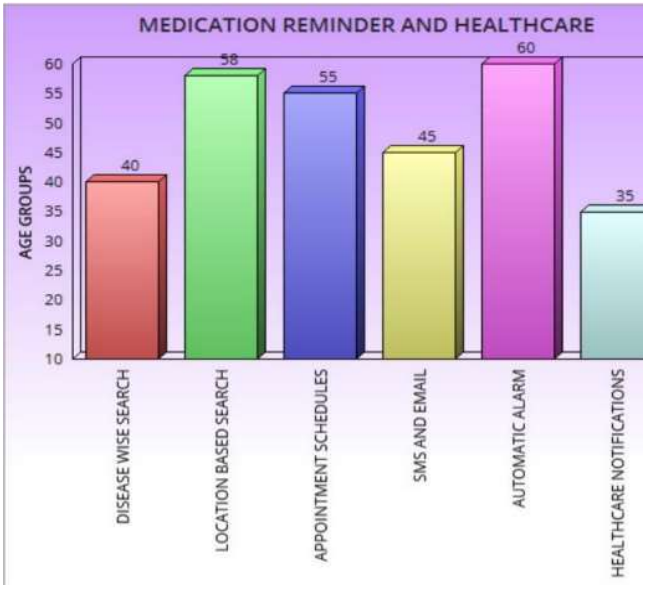
MotionPHR Health Record Manager which is available for $10 for the full version on Android and iPhone and $2 for a Lite version on iPhone, is less rated by the users because of the problem about flaws in the reminder system and a service that backs up user data [12]. Medsy is also an application that tries to provide a medicine remaindering system but it is loaded with fewer features. If the user is supposed to take a medicine three times a day then this application does not allow setting an alarm accordingly. But in our work, this disadvantage has been overcome by allowing users to set multiple alarms and notifications.

Another application DoseCast is loaded with some good features but it only provides notifications if the users have a 3G or Wi-Fi connection [12]. Wedjat also serves the same purpose. It can revise the in-take schedule automatically when a dose was missed without the doctor's prescription [8]. Because of the implementation of the health care module in our system, a user will be provided with a daily health care tip along with related videos and articles. So the proposed work tries to overcome all the listed disadvantages of other systems.

Fig, 3,1 Comparison of the App with all the existing apps

| | Express scripts | MyTherapy | Medisafe | Pill Reminder | Tata 1mg | Chooselyf |
|---|---|---|---|---|---|---|
| Alarm | Yes | Yes | Yes | Yes | Yes | Yes |
| Order refill | Yes | Yes | Yes | Yes | Yes | Yes |
| Connects with family | No | Yes | Yes | No | No | Yes |
| Printable health report | No | Yes | Yes | No | No | Yes |
| Appointments | No | No | No | Yes | No | yes |
| Food to avoid | No | No | No | No | No | Yes |
| Prescription | No | No | No | No | No | Yes |
| Al-powered virtual medical assistant | No | No | No | No | No | Yes |
| Book lab test | No | No | No | No | Yes | Yes |
| effects and dosage warnings | No | No | No | No | No | yes |

3.2 Activity Diagram




Gap Identification:

45 as they are more likely to access emails. The automatic alarm ringing feature was proved beneficial to 100% of the total population. The youths are very much concerned with the new healthcare awareness and are interested in knowing about new medical techniques being developed every day.

Many Medication Reminder Systems have been developed on different platforms. Many of these systems require special hardware devices to remind the patients about the medicine in-take timings. Purchasing new hardware devices becomes costly and more time and money-consuming. So in the given work an attempt has been made to implement a system that is economical, easily accessible and improves medication adherence. Medication non-adherence reduces the effectiveness of a treatment and imposes a financial burden on healthcare systems. The patients will get the schedule of medicine in-take time with medicine description, starting and ending date of medicine, notification through message or email, automatic alarm ringing system, and navigation system.

The scheduled reminder will not suggest any kind of medicine which is not prescribed by the doctor that will assure the safety of the patient and also will avoid wrong dosages. The patients can also search doctors disease-wise (depending upon the specialization of the doctor), which provides easy searching facility to the users and saves time.

Doctors can view all the fixed appointments along with the date and time, which they fixed, and through this, they can make new appointment schedules. We plan to focus on improving

There are many loopholes in existing reminder systems. They do not provide disease-wise searching of the Doctors, no optional notification only compulsion, and no facility for scheduling appointments with the doctors. Some of the systems have a default alarm tone so the users cannot change them. The scheduled reminder suggests any kind of medicine, a dose of medication, etc. automatically without a doctor's prescription, which can cause harm to the patients. Lastly, many of the systems available require special hardware which needs to be purchased. So we are introducing a method, data augmentation which is a good way to deal with this problem. SRP (Stroke Rotation and Parallel shift) is a data augmentation technique in which it is proposed to create multitudes of handwriting styles. This method considers each stroke of words and generates new data by changing the coordinates.

## 4. CONCLUSION:

The application gives reliable reminders, a good user interface, nice user experience and it supports many new features supporting medication adherence. We made a survey of 100 people including people of all ages. Searching doctors disease-wise was surveyed beneficial to the people aged around 40 of the total population on whom the survey was made. Again the location based (Area wise) search of the doctor was a good choice.

People of greater ages are more likely to forget the medicine timings as well as remember their appointments. The users will get the schedule of medicine in-take time with medicine description, starting and ending date of medicine, notification through message or email, automatic alarm ringing system, and navigation system. If the phone is running out of battery, the system also gives notifications through email and other registered numbers. So this was found beneficial to the people ageing under the overall performance of the system. Also, the interaction between patients and doctors through video calling and secure prescriptions will be focused upon. Some more ways to achieve medication adherence will be focused on.

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