

AUTOMATIC PILL DISPENSER BOX WITH TIME ALERT

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Abstract

Nowadays it is difficult for family members to be available all the time to help and support the aged and in our society most families are elementary with only childrens and parents and Caring for the aged member is very of serious issue . Often the aged persons fails to remember to take proper medication on time. There are issues concerning senior's ability to remember to take and medicine on their own. Automatic pills dispenser box is an approach as a solution to such problems . It dispenses medicines on required time with notifying the caretaker person. There are various medicine dispensers with same functionality available but different dispensers mechanisms and the designs The designing and mechanism vary with the types and sizes of the medicines . Hence a optimal dispensing mechanism for storing and dispensing medicines is required . In this research paper, a dispense mechanisms detailed review of the Automatic pills Dispensers and its design is presented .

Keywords — Medications management, Dispensers mechanism, Older persons .

Introduction

As the population of aging peoples has accelerated in recent years record with estimates annual net global rise of olders and aged 65 + is going to be exceed with 10million every year until year 2015 and over 60 countries will have at least 2 million people in this cohort by the year 2030[1]. Medication management is a rising concern throughout the healthcare industry

with the doctors , healthcare organizations , and other stakeholders (insurance companies) since elderly or senior patient's medication has serious problems such as overdose of drugs or wrong medicines [2]. Very often for them to forget to take medicines on right time

Especially, those who take multiple medicines at the same time. Also, they might accidentally take medicine dosage incorrect which may results unfortunate such as death [3]. Also , the group of professors (Grey ,Mahoney , & Blough) have done study about medication in three home healthcare organizations from University of Washington on 147 older participants taking 3 or more than 3 medicine pills , which resulted in 30.6% participants were under adherent and 18.4% of them were over adherent with at least one medication [4]. medication adherence is one of the most complex behaviours demonstrated by the patients. Result in negative outcomes for patients and may be compounded in populations with multiple morbidities which require multiple drug therapies . exemplified such population by the elder aged peoples . But also , the non-adherence may not more prevalent in older patients and there is no consensus in the literature that age is a predictor to them . Indeed, older patients may deliberately choose not to adhere to medication (intentional non-adherence) to avoid adverse effects [5]. Older persons with multiple chronic conditions face the complex task of medication management involving multiple mediciness of varying doses at multiple times [6]. Several studies found the prevalence of multiple chronic conditions in older peoples exceeds 60% [7]. A review of studies from seven different countries suggests that more than half

of preventable drug related (PDRAs) admissions are the result of medication errors with estimated prevalence of PDRAs in older patients more than twice of younger patients [8]. A recent study of older adult medication self-management found that most errors

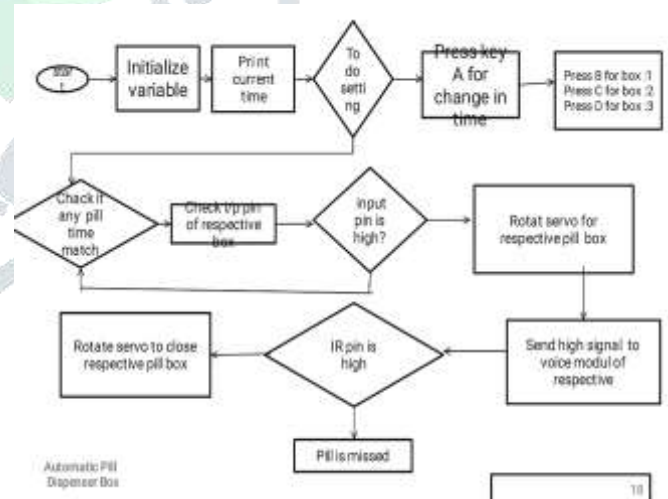
the medication dispensing device is easy to use, very reliable, useful in coordinating personal medication management. These results indicate that medication dispensers technology is enhanced and can be acceptable tools for older adults to help manage self-care.

found in the activities of administering the proper medications at the respective correct dosage and the right time (31.8%); following with clinical prescriptions regarding medication usage (21.7%); and medication use modification, based upon the clinical prescription and monitoring by themselves (41.9%) [9]. Tele-health technologies are basically used in household and communities settings to enable the monitoring of older person's well-being (example - By capturing the vital symptoms etc.) [10] and communication with health care providers (help of video-clips or other various communication platforms) [11]. Advancements in such technologies have also enabled the progress & developments of the devices that can be used in residences to assist with the medicines management and monitoring of elderly persons using less in cost methods. Medicinal e-management applications are electronic systems for patients empowerment, rising the accuracy of medication administration through the reminder services and promise to lesser in costs and involve care delivery process. These tools and systems include the medicines dispensers devices, wristwatch alarms applications on smartphones [12]. Also, The integrated environmental sensing applications have been developed for prompting of patients in different contexts to improve medication adherence [13]. A medication dispensing device as a medication management intervention to older adults discharged from a home health care program. Medicines management for older adults is very complex task and usability concerns of younger and older adults are different as counterparts regarding the vision, cognitive ability and physical activeness. The medication dispensing device was designed for medication management to simplify the complex tasks with the aim of reducing medication errors and improving communication with the providers. Better communication with medication error reduction are important to reach the larger goals of improved outcomes in older adults health status, rates of hospitalization, rates of nursing home admission, total expense of care and costs per quality adjusted life year. In this research older adults have accepted

Automatic pills dispenser box

A pill dispenser box is a device which provides the help to take medicines at correct time. These are very useful devices to take correct medication at ease. Automatic dispenser has separate compartments for each pill which can be dispensed at required time with requirement number of each pill. For the build of the device "IOT" is used. Microcontroller is the main part of the device which controls various functions and operations of the device. The servomotors and stepper-motors are controlled by the microcontroller through the motor controller.

Flowchart



Different Medicine Dispensers And Its Mechanism

There are various automatic medicine dispenser and each with different dispensing mechanism. For one type of medicine certain mechanisms are designed. (i.e. one size & shape) Here, we are discussing such mechanism of dispenser and mainly focusing on the dispenser that can hold and dispense various types of medicines.

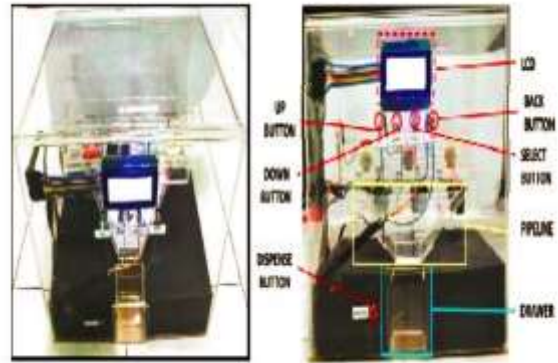
This device works basically on **3stages**:-

1)Initial stage 2) Comparison stage 3)Reminder Stage

1)Initial stage - it involves user to enter details about medicines for each pill's box with the use of keypad

2) Comparison stage - during this stage device compares the sub box information with RTC time.

3) Reminder stage - once the information match,high signal goes to servomotor of respective sub box and voice module also get high signal and generate the message.



Software mostly used for different types of medicine dispensers :-

AurdinoIDE - The Arduino Integrated Development Environment (IDE) is across platform application (for Windows, macOS, Linux)that is written infunctions from C and C++ It is used to write and upload programs to Arduino compatible boards , but also with the help by use of 3rd party cores , other board of vendor development .

Block diagram



Block diagram Of Digital pill box using Arduino

Automatic Pill Dispenser Box

Conclusion

This study introduced a medicines dispensing device as a medication management intervention to older peoples discharged from a home health care organization. Medicines management is not a easy task and older

Pill dispenser box with alarm via smart phone notification

The pill dispenser is designed with three compartments specially for three different types of pills . Once the button is switched the vibration motor and IR sensor will be turned on. The vibration motor vibrates the compartment where the pills were placed earlier until the pills came-out from the compartment to the drawer through a pipeline.

IR-sensor will count the amount of pills coming-out based on the amount of pills that have been set at per requirement. The process will be stop once the number of pills that came-out meet the requirement of the medicines needed [14].

have different usability concerns than younger. The medication dispensing device was designed to simplify the complex task of medicines management with the aim of reducing medication errors and improvement in communication with providers . Medicines error reduction and better communication are important to reach the larger goals of improved results in older elders health status, hospitalizations rates , rates of nursing home admissions , total expense of care and cost as per the quality adjusted life year . Olders in this study accepted the medication dispensing device as very reliable, asy to use , handling and useful in coordinating personal medications management. These results indicate that technology-enhanced medication dispensers can be acceptable tools for older to manage self care in collaboration with home care nurses . These results are encouraging because acceptance of technology-enhanced medicines management is a requirement

toward improved monitoring of unpredictable responses to drug therapies in elders. Cost of system and the design were indicated as areas for improvement. Design is an iterative process and implementations in a real-world context often reveal opportunities for better design. A method was required to ensure that the patients would take medicines on time as prescribed by the doctor, so that the working class can be relieved of the patient's medicating schedules. Also, it was necessary to ensure that proper dosage was given at the correct time in their absence.

This system have to be absolutely user friendly and flexible to adjust the time at which the medicines have to be dispensed. These features have to be in a system at a affordable price so that it is affordable by every common man. Considering all these key points an automatic medicine dispenser for older persons has to be designed with optimal dispenser design. In this paper some of the dispensing mechanisms are considered , studied and discussed. Also these mechanisms is an optimal mechanism is to be chosen and for further improvisation update or new mechanism by taking inspiration from all must have to be designed the mentioned mechanisms such that it can store any medicines or pills .

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