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Medication Adherence Through Structured mHealth Education In Pulmonary TB: A Literature Review

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Abstract

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Introduction: Pulmonary tuberculosis (TB) is a global health concern. The lengthy treatment process, which lasts at least 6 months, can lead to non-adherence due to boredom, resulting in reluctance to continue treatment. In foreign countries, non-adherence is addressed through interventions such as the use of mobile phones or mHealth, and several studies have highlighted the benefits of mHealth for TB patients. Objective: This study aims to describe the benefits of mHealth on the adherence of TB patients, including treatment evaluation, self-efficacy, and medication adherence. Methods: A literature review was conducted to analyze selected studies and generate new ideas. Discussion: By reviewing and analyzing 10 selected journals, it was concluded that mHealth applications and video Directly Observed Treatment, Short-course (vDOTS) are highly effective in improving medication adherence among pulmonary TB patients. Recommendations: Further research is encouraged to develop mHealth applications that enhance medication adherence among TB patients and to test their effectiveness

Background

Pulmonary TB is an infectious disease caused by Mycobacterium bacteria tuberculosis. Before the COVID-19 pandemic, TB was the main cause of disease death after HIV/AIDS. Therefore pulmonary TB is a constant health problem became the attention of WHO in the world. In 2014 and 2015, all WHO Member States and The United Nations (UN) is committed to ending the TB epidemic, through implementation of the WHO End TB Strategy. This strategy includes achievements (for 2020 and 2025) and targets (for 2030 and 2035) (World Health Organization, 2022).

WHO (2022) also estimates that 10.6 million people will be infected with pulmonary TB in the world in 2022 in 2021 and this figure increased by around 4.5% from 10.1 million in 2020. Apart from There was an increase in the TB incidence rate with new cases per 100,000 population estimated at 3.6% between 2020 and 2021. In 2021, geographically, data shows that the majority of tuberculosis (TB) cases are concentrated (45%) in Southeast Asia, (23%) Africa and (18%) West Pacific. These three regions contribute more of two-thirds of total TB cases worldwide. Countries that become The largest contributor to the number of TB cases is India with a percentage of 28%, followed by Indonesia (9.2%), China (7.4%), Philippines (7.0%), Pakistan (5.8%), Nigeria (4.4%), Bangladesh (3.6%) and DRC (2.9%).
Existing data: Indonesia is the second largest contributor to incident data world TB. Meanwhile, in Indonesia itself, in 2021 the number of incidents was 397,377 cases and death rate of 34 per 100,000 population (Ministry of Health of the Republic of Indonesia, 2022). Internationally DOT's is one of the methods that has been recommended for TB control because of its very efficient and cost-effective strategy.

In TB patients, treatment lasts a minimum of six months. It's a long process This is what causes patients to tend to disobey because they are bored. So lazy to continue treatment. And this is what causes patients to drop out of medication and is not uncommon came to the hospital already in a serious condition. Based on data from (RSPS, RM, 2023) from June-August 2023 patients treated with TB were as many as 115 cases. Based on direct interviews with several patients, their reasons are non-compliance is boredom taking medication, the patient's ignorance about TB treatment true, lack of family attention, lack of communication between the health care team with patients/families, as well as beliefs in traditional medicine, consider this It is a hereditary disease and can heal itself.

Factors causing non-compliance with treatment abroad were investigated intervened with the use of mobile phones or *mHealth* if seen from several overseas research that writes about the benefits of *mHealth* for TB patients. However Indonesia itself still has minimal research on the use of *mobile phones/Mobile phones* on compliance in TB patients. So it is necessary to do *a literature study* about the use of *mHealth* for the treatment of pulmonary TB patients.

This literature review aims to describe its use and how *mHealth* development for TB patient adherence to treatment consisting of adherence to taking medication, evaluation of treatment and *self-efficacy* of pulmonary TB patients.

Method

This study uses *a literature review,* namely a study conducted for analyze several pieces of literature selected from several sources so that they can produce results a new idea. The material used in this study is a journal on the topic with using 5 categories of keywords, namely: *compliance and education and tuberculosis and self-efficacy and Technology.* Journals were obtained through online database searches ncluding: *Pubmed, Goggle Scholar* and *Science Direct* in 2017-2023.

Result and Discussion

From various international *evidence bases* , there are several types of *mHealth* , namely: direct calls/ *voice calls* and automatic SMS to remind you to take medication and remind the routine control schedule. Research conducted by Sumari-De Boer et al., (2019) evriMED in the form of SMS which is used as a reminder and feedback on visits patients to the clinic, is acceptable because it is proven to be effective in increasing patient compliance to TB treatment. Therefore, EvriMED is recommended as the standardized choice for TB patient cards in the Sub-Saharan Africa region. However, more research is needed further information about its implementation to explore possible factors obstacles if used more widely.

In connection with this research, Kumar et al., (2019) stated that *mHealth* application is effective as a reminder of medication adherence and distribution information that can be used in managing TB. Different from reminder based SMS Elsewhere globally, most study participants prefer calls voice. The efficacy of *mHealth* interventions can be enhanced when the components are allows participation of all demographic groups to be combined and adjusted with individual needs. The effectiveness of mobile phone applications such as vDOT may be necessary explored in the Indian context, while ensuring user privacy and confidentiality on end of use.

Further research on digital utilization was also carried out by (Chen et al., 2023; Indah et al., 2022; Leddy et al., 2023) they researched the impact of use Ayo DOTS and 99DOTS digital technology on medication adherence, improvement knowledge and self-perception of TB

patients. From this study, patients were given treatment by using the application. Researchers carry out tests by measuring whether before and after being given treatment, there were differences in knowledge, adherence to medication and self-perception of TB patients so that the technology used can stated to be effective in increasing knowledge, self-perception and adherence to taking medication TB patients. However, according to researchers, concerns about stigma need to be considered about TB disease and the inability to charge mobile phones so that they can hinder this program.

From the results of research conducted by Fuadiati et al (2023) it is stated that The technology used can function optimally when officers can empower it patient. One of them is VOT, where this technology is one of the tools used to monitor and is effective in increasing adherence to taking medication TB patients. And it is hoped that this VOT can revolutionize patient monitoring, increasing motivation and self-management using technology. This is in line with research conducted by Rao et al (2023) which states that it is necessary the drive to transition from face-to-face DOT to mobile-based vDOT so that monitoring patient compliance can be done more easily.

Based on the results of the study from several journals above, a new idea can be found that mHealth interventions are very well used and it is hoped that they can be developed with Add or create new features, for example you can use Linktree where In this technology, the required features can be added, including: attendance patients after taking medication, educational videos, treatment data, information regarding facility data nearest health and other appropriate features, so that pulmonary TB patient compliance can be achieved to be better. However, it is still necessary to identify patient needs regarding education what needs to be entered into the application.

It is hoped that the development of the mHealth TB patient information system will be very important useful if applied in services so that we as health workers can helps reduce the incidence of drug withdrawal in TB patients. So it feels necessary reviewed again regarding interventions in health services using applications mHealth for pulmonary TB patients which can contain information about the health care system can increase compliance in TB patients. And this mHealth application is connected with data reports to Indonesian and world TB health centers.

Conclusion

To reduce the drug withdrawal rate in TB patients, things that can be done include: using mHealth technology which has been used so far by adding or create a linktree feature. Which Linktree can be used as an alternative for improvement Pulmonary TB patient compliance in treatment by adding features for supervisors and reminders to take medication, education in the form of videos, leaflets and questions It is hoped that this linktree can be an effective educational medium for TB patients.

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