Application of STAR NURSE (Smart Reminder for Tuberculosis Nursing Care) as an Enhanced Strategy to Improve Medication Adherence in Tuberculosis Patients

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Abstract

Objective: The aim of this paper was to review the current literature in order to find solutions in developing innovation to improve medication adherence in TB patients.

Methods: Evaluation of the literatures from Google Scholar and Science Direct on the internet from 2006 to 2016 used keywords Tuberculosis, Tuberculosis medication, and health applications was conducted in this study.

Results: There were some principles which could improve medication adherence such as support, motivation to recover and technology application as a reminder and source information. We propose a technology application based on Android to improve treatment adherence of TB patients, named STAR NURSE (Smart Reminder for Tuberculosis Nursing Care). This application reminds TB patients in consuming medications, monitors patient’s adherence and provides source of information for patients, family (caregiver), and healthcare providers.

Conclusion: Application of STAR NURSE may improve medication adherence in TB patients.

Keywords: Tuberculosis, Tuberculosis Medication, STAR NURSE

Introduction

Tuberculosis (TB) is an infectious disease of the respiratory tract that became the second cause of the death after heart disease.1) TB has become a global issue. WHO in 2016 stated that TB is an infectious disease that causes deaths worldwide. The six countries with the largest TB cases are India, Indonesia, Nigeria, Pakistan, the Republic of China, and South Africa.2)

TB is a disease which can be treated and cured. The Indonesian government has implemented a strategy of Direct Observed Treatments Short Course (DOTS), such as giving free drug and implement PMO as a patient supervisor.3) Although the government has implemented those program, many TB patients are impatience and disobedient to the treatment. This usually happens because TB treatment needs a long time.4)

Factors affecting TB patients’ adherence in the treatment are recovery motivation, family support and PMO, meanwhile the duration of treatment and forget to take medications are the barrier of treatment adherence in TB patients.5) Therefore, it is needed an innovation to improve medication adherence in TB patients.

Along with the development of technology, the use of a smartphone in Indonesia grew rapidly. Emarketer, a research institute of digital marketing, estimates that on 2018 the number of active users of smartphones in Indonesia more than 100 million people. It makes Indonesia as the fourth largest country in the world with smartphone active users after China, India, and America.6) Android application can make users easily access information on the internet. It can use as multimedia and tools of education.7) One of the applications which can be created is an application to improve public health status in Indonesia with a health based application includes health information.

Management attempts of TB disease is not yet maximal, although already exist government programs.
Furthermore, TB treatment which takes a long time makes TB patients lazy and forget to take a medicine, so many TB patients are disobedient to treatment. Therefore, the authors develop an innovative application STAR NURSE (Smart Reminder for Tuberculosis Nursing Care). This innovation is expected to improve adherence TB patient treatment, so it can reduce the morbidity and mortality of TB in Indonesian.

Aims

The aim of this paper was to review the current literature in order to find solutions in developing innovation to improve medication adherence in TB patients.

Method

This paper review the current literature about respiration disease especially TB and its treatment. Previously, the author collect data through textbook, articles, surfing Google Scholar and Science Direct on the internet, statistic data from WHO and Indonesian Ministry of Health from 2007 to 2016 using keyword: TB, Direct Observed Treatment Short Course, the factors that affect treatment adherence in TB Patient, technology innovation to improve adherence to medication, motivation for well-being improves adherence of treatment and health application based on android. Data was processed and prepared in a systematic and logical analysis. Analysis data used descriptive argumentative technique with pursing problem according to phenomenon and theory then continues to formulate solutions based on the analysis of data. In the end, author performs a general conclusion and recommend an idea.

Result

There were some principles improves adherence of treatment in chronic diseases such as support from family or significant others, motivation to be well-being and used technology as a reminder and source information. Research done by Lubis et.al (2016) state that SMS (Short Message Service) could be a reminder to improves treatment adherence in Diabetic Mellitus patient. This result supported by Alfian (2014) which state an SMS as a reminder improve adherence of medication and controlled blood pressure in hypertension patient. Others research done by Susanti (2013) says that support from family increased the diet adherence in Diabetic patient. The motivation for well-being also became a principle to improve adherence to medication, this statement convenient with research done by Yuniar et.al (2013) says that motivation to be well was one-factor adherence to treatment in HIV/AIDS patient and research done by Okeyo et.al (2016) says that social worker had contribution to TB patients management and facilitate patient counselling.

The author has developing an technology application based on Android to improve treatment adherence of TB patients. This application would have some tools which had the function to reminds TB patients in consuming medications and monitoring patient's adherence for patients, family (caregiver), and healthcare providers. Others function as a resource about disease and treatment of TB. This application named STAR NURSE was developed based on android, could be able to access used a smartphone and computer. Hopefully, it could support active participation of PMO and family or significant other in supervising and motivation TB patient compliment in their TB treatment.

Application of STAR NURSE (Smart Reminder for Tuberculosis Nursing Care) is an application based on Android as a reminder and a source of information about the disease TB that can be used by patients with TB, PMO, families of TB patients, and health professionals via smartphones and computers specifically for healthcare providers who work in a healthcare facility or health-related agencies. Users STAR NURSE divided into two, namely health and non-health personnel. The non-health personnel is TB patients, PMO, and families.

Each TB patient had an account that could be used by TB patients, PMO, and families thus allow them could know the condition and treatment of TB patients were being done by the patients. Application of STAR NURSE could be used by healthcare providers as a data center about TB patient and would be able used as the statistical data related to TB condition in Indonesian.

Application of STAR NURSE has five tools which can be used by non-health personnel, which is as follows:

1. The tool "Ayo Minum Obat" is an alarm that will sound when TB patients take medication accompanied by the name and picture drugs must be taken in accordance with the categories and stages of treatment that is being run by TB patients. In this tool, selecting categories and stages of treatment for health professional.

2. The tool "Saya Rutin Minum Obat" is a tool that lists the compliance of TB patients in treatment.
3. The tool "Ayo Periksa" is a tool that provides inspection schedule TB patients to health care facilities and an alarm that sounds at the time TB patients have to carry out checks to healthcare facility.

4. The tool "Saya Sudah Periksa" is a tool that contains the results of the examination and advice to do TB patients in treatment.

5. The tool "Ayo Belajar TB" is a tool that has two icons that TB group icon named "TB Indonesia" that facilitates users to exchange information and experiences related to TB and the icon "Seputar TB" which contains information about TB.

The authors developed an innovative "Application of NURSE STAR" which is an application based on Android as a reminder and a source of information about the disease and treatment of TB that can be used by TB patients, PMO, family and healthcare providers. This innovation is expected to improve medication adherence in TB patients. Application of NURSE STAR also supports the PMO and family to participate actively in supervising and motivating TB patients to obedient in their treatment. STAR NURSE development is a good thing so that people, especially TB patients and families to take advantage of technology owned to support health.

Users STAR NURSE grouped into two: the health and non-health personnel. The non-health personnel is TB patients, PMO, and families. When someone logged in as a non-health personnel will be five tools that can be used. The first tool “Ayo Minum Obat” is an alarm that will sound every time TB patients must take medication with name and picture of drugs must be taken. The alarm will be set by healthcare providers in accordance with the categories and stages of treatment of TB patients. The tool is also equipped with a connector that can detect compounds of all types of Obat Anti-TB (OAT) through odor the mouth of patients.

The second tool "Saya Rutin Minum Obat" is a list of data that describes medication adherence in TB patients. The third tool "Ayo Periksa" is a tool that provides TB patient examination schedule and an alarm that sounds when TB patients need to conduct the examination to a healthcare facility. The fourth tool "Saya Sudah Periksa" contains the results of the examination and the advice given by healthcare providers in accordance with the conditions of TB patients. Tool fifth "Ayo Belajar TB" contains two icons, it is "TB Indonesia" is a group such as social media can be use by user to discuss about information and experience related to TB treatments and icons "Seputar TB" is the source of information about TB.

When someone logs in as a health personnel will have three tools that can be used in STAR NURSE. The first tool "Pusat Data TB" that contains all the data results of the TB patients were enrolled in a healthcare facility. The second tool "Hasil Pemeriksaan" is a tool that can be used by healthcare providers to document the results of the examination of TB patient. The third tool "TB Indonesia" is a group of TB in Indonesia. Function of this tool same as be use by non-health personnel, its is as source of information and support group for TB patients.

Discussion

The phenomenon that often occurs in patients with TB is impatience and disobedience of TB patients in TB treatment because it requires discipline in a long time. Some of the factors that influence TB patients in their treatment among others are lazy and forget to take medication, motivation to recover, family support, and supervision of the PMO.

DOTS program has set the PMO for every TB patient which one of his duties is to oversee and encourage TB patients to regularly in treatment. However, the existence of the PMO doesn’t guarantee TB patient’s adherence to the treatments. It is due to their togetherness which was not maximized.

The authors developed an innovative "Application of STAR NURSE (Smart Reminder for TB Nursing Care)" which is an application based on Android as a reminder and a source of information about the disease and treatment of TB that can be used by TB patients, PMO, family and healthcare providers. This innovation is expected to improve medication adherence in TB patients. Application of NURSE STAR also supports the PMO and family to participate actively in supervising and motivating TB patients to obedient in their treatment. STAR NURSE development is a good thing so that people, especially TB patients and families to take advantage of technology owned to support health.

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Some of the advantages of the application of STAR NURSE is that users can use it anytime and anywhere as you wish, reminiscent of TB patients to take medicine and performed in accordance with the schedule, flexible because the information and treatment programs that exist within these applications at any time can be renewed according to the development of science and government programs, enhancing its knowledge, supporting quality DOTS program through improved performance PMO and family members to be actively involved in the treatment of TB patients. In addition, this application can also be used as a means of exchanging information and experiences among its users which it can.
motivate TB patients to recover. Data results of examination the TB patients were enrolled in a healthcare facility can also be used as the statistical data related to TB in Indonesia. Therefore, this innovation is very effective when can be applied to support TB treatment that will improve medication adherence in TB patients.

Conclusion

TB was an infection disease caused by Mycobacterium TB that attacks some organs, especially lungs. The Indonesian government had set DOTS program as a strategy for TB treatment with the main goals improves adherence in TB treatment such as gave TB drug for free and appoint someone as PMO. Currently, there was so much TB patient that not obedient in their treatment because this treatment took a long time. Factors that influenced in waywardness to medication was lazy and forget to take medicine, lack of motivation to recuperate, lack of support from family or significant others, and lack of supervision from PMO. The existence of PMO was not maximal yet because their togetherness had low intensity. Maximized the role of PMO, family, and significant others was important so needed something which could support their performance thus could improve adherence TB patient in their treatment.

Thus, the author gave an idea to develop innovation of application of STAR NURSE which be able to access by TB patient, PMO, family or significant others and health professionals by using smartphone or computers with android based. Application of STAR NURSE served alarm system and specific information about TB and its treatment. Hopefully, through this innovation TB patient, PMO, family or significant others could remind TB patient about their treatment and it leads to adherence in TB treatment.

Recommendation

The Ministry of Health as the highest authority in the health sector advisable to help realize the application of STAR NURSE because this application will support the government's DOTS program through increased active participation of the PMO and family.

Reference