DESIGN OF PATIENT-CENTERED SYSTEM FOR COLLABORATIVE MANAGEMENT OF TB AND HIV TREATMENT IN BOTSWANA

Tsholofetso Taukobong (mphot@mopipi.ub.bw), Onalenna Junior Makhura (Makhura.Onalenna@mopipi.ub.bw), Moemedi Lefoane (Moemedi.Lefoane@mopipi.ub.bw), Computer Science Department, University of Botswana, Botswana
Lerato Moremi (loratomoremi@yahoo.com), Dimakatso Kebuang (dkebuang@gmail.com), Institute of Health Sciences Molepolole, Botswana

ABSTRACT
The proposed mobile health innovation termed Patient-Centered System For Collaborative Management Of TB And HIV Treatment In Botswana. (Communicable Diseases Management) aims at using mobile technology and web based services to help address objectives of collaborative TB and HIV activities as specified in both the WHO and Botswana TB/HIV Policies (Table 1 – [1,2]), thus providing improved delivery of health care services in the management of these two diseases. The country’s TB/HIV co-infection ranges between 60-80% of TB patients in most districts. HIV is the main reason for failure to meet Tuberculosis control targets in high HIV settings while TB is a major cause of death among people living with HIV in Botswana, hence the need for collaborative management of the two diseases.

KEY WORDS

1. INTRODUCTION
Botswana is one of the countries that have been hit hard by HIV/AIDS. It has a population of about 2 million and an estimated 300,000 adults in Botswana are living with HIV/AIDS. This makes Botswana the second highest infected country after Swaziland in Africa. Most of these patients are also infected with Tuberculosis (TB). The country’s TB/HIV co-infection ranges between 60-80% of TB patients in most districts. HIV is the main reason for failure to meet TB control targets in high HIV settings while TB is a major cause of death among people living with HIV.

Nevertheless, the country has done tremendously well over the years coming up with programmes to fight this scourge but challenges continue to crop up that needs innovative interventions. Programme monitoring and evaluation (M&E) remains one of the main challenges. In Botswana, TB/HIV management coordination is very poor. Patients with the two diseases receive fragmented services from two programmes (Anti-Retro Viral (ARV) programme and TB programmes). These programmes have independent guidelines and personnel.

The new TB/HIV policy has not been of any help. There is often little or no communication between people offering these services. A co-infected patient moves between two service points to receive services in the same facility. This is understandably so due to infection control guidelines. HIV infected patients have suppressed immune systems and are prone to communicable diseases such as TB. The two programmes have the same challenges of poor adherence by patients. Patients may default treatment in one programme and do well in the other. If the two programmes were coordinated well, defaulting dual infected patients could be easy to trace. Furthermore, it often takes a while to realize that a patient is defaulting on treatment due to poor monitoring and evaluation. In the TB programme a ‘defaulter’ refers to a patient who misses treatment for 60 consecutive days. The programme’s default rate remains high particularly in urban areas due to late realization of patients missing treatment. Patients often claim to be taking treatment at other facilities other than were they are registered while in actual fact they miss treatment.

Table 1. Recommended collaborative TB/HIV activities

<table>
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<tr>
<th>Establish mechanisms for collaboration</th>
<th>Jointly by NACCP, NTP and partners</th>
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<tbody>
<tr>
<td>Set up a coordinating body for TB/HIV activities</td>
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<td>Conduct surveillance of HIV prevalence among TB patients</td>
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<td>Carry out joint TB/HIV planning</td>
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<td>Conduct monitoring and evaluation</td>
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Reduce the burden of TB in people living with HIV: the “Three Is”

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<tr>
<th>Reduce the burden of HIV in people living with TB</th>
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<tbody>
<tr>
<td>HIV control programmes</td>
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<tr>
<td>Provide HIV testing and counselling</td>
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<tr>
<td>Introduce HIV prevention methods</td>
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<tr>
<td>Introduce co-influenza prevention therapy</td>
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<tr>
<td>Ensure HIV care and support</td>
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<td>Introduce antiretroviral therapy</td>
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2. METHODS
The proposed system will provide an integrated and centralised patient-centred clinical management system with the following components and functionalities:

1. PATIENT RECORDS MANAGEMENT SYSTEM
   - Keep patients’ records including medical history, tests results, treatments and health facility they are registered at.

2. TREATMENT TRACKING SYSTEM
   - Allow monitoring and tracking of patients tests and results
   - Allow collaborative monitoring of patients treatment, i.e for those on the TB Direct Observation Treatment (DOT) and those on Anti-retroviral treatment (ARVs) for tracking and surveillance of adherence
   - Enable caregivers at each facility to observe and record on DOT patient daily.
   - Give alerts on test results availability and possible DOT defaults for patients at each specific health facility

3. REMOTE ACCESS TO PATIENT INFORMATION
   - Allow remote access to patient information by doctors through mobile phones in rural areas to enable treatment information recording.

With centralised access to patient information, the coordination of these two diseases will be greatly improved. For instance, TB coordinators and other caregivers will be able to quickly identify and pick on DOT defaulters as patients are monitored and recorded in one central point daily regardless of which health facility they used to take their treatment. Monitoring and evaluation on national level through surveillance information has been proven to improve adherence [3].

4. DISEASE STATUS MANAGEMENT SYSTEM
   - Provide intelligent decision support to assist doctors in determining disease stage for each patient, prescribing the most appropriate treatment options as well as resolving whether a TB patient is healed, all these based on both diseases treatment guidelines.

This will assist doctors in making more efficient decisions and provide some form of audit trail as to why certain decisions were made.

5. MEDICATIONS ORDERING SYSTEM
   - Store patient prescriptions
   - Allow medicine reorders
   - Track and record stock level so as to give message alerts when certain medicines are at critically low levels in order reduce risk of shortages in all facilities.

Unavailability of TB medications or ARVs and travelling long distances to get medications have been attributed to poor adherence, hence the need to improve both the efficiency and effectiveness of the medications ordering process [4].

6. MYCHUM MOBILE SERVICES
   - Allow patients to register for this service using mobile phones and use what are called Unstructured Supplementary Service Data (USSD) codes on mobile phones. These codes provided by the mobile phone network service provider give access to menu based information and services. For example patient may check their next appointment dates through this service.
   - Provide SMS application which sends patients SMS confirmations of their next appointment as well as reminders as appointment dates gets nearer.
   - It will also send patients reminders on their DOT or ARVs medication intakes at the specific set times.
   - MyChum will have a subscription option that sends patients relevant healthy lifestyle tips and encouragement appropriately customised to patient stage in either or both treatments. E.g A patient who has been on DOT for 3 months may receive “Great progress you are making champ! Remember feeling better does not mean you are healed, you have to complete your therapy to avoid drug resistance or failure.”
   - Incorporate voice services to also cater for the blind. Deaf people to be catered for by SMS based services so that these fractions of the community are not completely left behind.
   - Give patients quick access through frequently asked questions (FAQs) on TB/HIV and general treatment management information.
   - Allow patients to anonymously interact and share experiences in a forum/chat environment.

Studies have identified forgetfulness as a major patient associated factor contributory to poor adherence, hence the need for reminders for medications and appointments [5]. The importance of patient social support, education strategies, quantity and quality of information available about diseases on improved adherence cannot be overly emphasised.

SYSTEM USERS
These will be the patients, the caregivers, that is nurses, doctors, pharmacist, TB and HIV coordinators and remote caregivers e.g a farmer acting as caregiver to a herdman employee.
3. CONCLUSION

With an estimated 60-80% of patients with TB in Botswana being also co-infected with HIV, there is need for collaborative management of the two diseases. TB is also one of the major causes of death in people living with HIV/AIDS. For effective treatment of both diseases adherence is vital but there are a number of socio-economic factors that negatively affect patient adherence. The Botswana TB/HIV Policy Guidelines state that, “The convergence of the TB and HIV epidemics necessitates a collaborative public health policy approach. However, this has proved difficult as TB, HIV/AIDS control policies, and programmes have evolved separately”. An innovative mobile health system is therefore proposed to assist in the effective collaborative management of TB and HIV/AIDS.

REFERENCES


