“Mobile Healthcare Benefits and the Health Threat Posed by Mobile Health Technologies in Africa”

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Outline

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Introduction

✓ Mobile health (mHealth) uses mobile technologies specifically mobile devices such as mobile phones, laptops, tablet computers and any handheld device with internet connectivity to support long term health and wellbeing.

✓ Examples include the use of sms, social media, emails and so on.

✓ For the purpose of this paper mHealth means any public or private health activities made possible by mobile device(s).
mHealth

✓ has the potential to transform health care [2].

✓ is key to modern healthcare solutions [3].

✓ Mobile devices portability and ability to operate with minimal infrastructure

✓ regarded as better option to deliver health services in the developing countries.
Healthcare in developing countries: African context

- characterised by
  - limited access,
  - high costs,
  - low quality
  - and delay to meet the needs of the clients.

- crippled by
  - poverty,
  - ever-increasing population growth,
  - loaded with high cases of diseases
  - and inadequate health workers [4].
Healthcare players in the developing countries

✓ separated by vast distances
✓ further constrained by poor communication infrastructure,
✓ obsolete IT solutions that impede their potential
  ✓ to collect and disseminate information [4].
✓ mHealth has been identified as a viable solution
  ✓ to improve healthcare delivery systems in their regions [3].
✓ especially when considering minimal mHealth gadget necessary to make this a reality i.e. mobile phone [3, 4].
Statistics

- In 1998 Africa had less than 4 million mobile phones [4].

- At the end of 2015 about 46% of African population subscribed to mobile services.

- Africa is expected to have more than 725 million unique subscribers by the year 2020.

- According to African Health Observatory [5], penetration of mobile phones and associated mobile networks in developing regions such as Africa makes mHealth legitimate and possible.

- This is good news
Purpose of this study

✓ To analyse possible hazards and benefits of mobile phones
✓ as mobile health equipment to the environment and wellbeing
Methods

✓ A review of the literature assisted by Atlas.ti software on mHealth benefits was undertaken.
✓ Formal searches were done using the following databases to identify literature;
  ✓ Elsevier,
  ✓ PubMed,
  ✓ Google scholar
✓ The search was restricted to
  ✓ research articles,
  ✓ date of publication (2014 to 2017)
  ✓ and publication language (English).
Methods

✔ Information on the benefits of mHealth was taken using keywords
  ✔ ‘mobile health’,
  ✔ ‘mHealth benefits’.
✔ Within selected articles,
  ✔ we went further deep into those that addresses the benefits of mHealth worldwide
  ✔ and funnel the search results to articles that talk mHealth benefits in Africa.
Methods

✓ A second literature search which focused on the effects of mHealth obsolete devices on the environment and health included;
  ✓ grey literature,
  ✓ Google, scholar
  ✓ and Elsevier databases

✓ A combination of the following search terms were used:
  ✓ ‘mobile health devices and environment friendliness’,
  ✓ ‘green mobile health ‘,
  ✓ ‘electronic waste and environment’
  ✓ and ‘e-waste and health’.
Results

The following results were presented;

1. A relatively brief examination of the various benefits of mHealth

2. An extensive review of the potential environmental risks and wellbeing hazards associated with discarded or unwanted mHealth waste.
Benefits of mobile phones

- mHealth transformative power of healthcare services in Africa.
  - enhances communities both rural and urban with up-to-date knowledge and information,
  - improved service delivery
  - and reduced reaction time during emergencies [5].
- Amid all these benefits,
  - mHealth is also prone to human errors.
  - Mobile phone can be lost or stolen.
  - Smartphones and tablets are also vulnerable to hacking, viruses and malware especially when these devices use unsecured internet connections.
Examples of how a simple SMS service can help in diseases control and prevention

- In Kenya,
  - short message service (SMS) is benefiting users to get up-to-date list of health professionals and centres starting with the closest ones.
  - Locating healthcare service quickly can save lives.

- In Mozambique,
  - the SMS is used to relay much needed information to people with human immunodeficiency virus (HIV).
  - The educational information help infected people on how to adhere to treatment and prevent mother to child transmission of HIV.

- In South Africa,
  - the SMS is used to provide pregnancy, postnatal and baby care information to women in their preferred language. The service is called MAMA SMS service.

- In Rwanda,
  - an SMS service called Rapid SMS and mUbuzima is used to track pregnant women and newly born babies,
  - and promote early detection of life threatening emergencies [5].
Benefits of mobile phones

✓ Worldwide evidence underpins the utilisation of SMS as a service to improve adherence to medicine and participation to scheduled appointments [11, 12].

✓ However according to Househ [13] there is a paucity (fewness) of evidence on the benefits of SMS service interventions for
  ✓ appointment updates,
  ✓ advancing wellbeing in developing countries
  ✓ and preventive healthcare.
The next concerning issue is what happens to these mobile phones when they are no longer wanted by their users.

What are environmental and wellbeing threats contained by these retired equipment?

Literature shows that when these obsolete equipment are not managed properly they become health and environment hazards.
Electronic waste (e-waste) definition

✓ no standard definition of e-waste
✓ E-waste comes with different definitions given by literature [8,14]

✓ For the purpose of this paper e-waste will be defined as: any mobile health equipment unwanted by its owner or users regardless of equipment functional state.
Characteristics of e-waste

- Complex problem;
- Non-decomposable waste
- No single method to properly manage it
- E-waste includes both valuable and toxic metals[8].
Components of e-waste

✓ Value metals include and not limited to
  ✓ gold, silver, copper and aluminium [14].

✓ Toxic metals include
  ✓ cadmium, mercury, bromine and lead [8].
Contaminants released by e-waste were associated with cases of
- liver cancer,
- lower birth weight,
- asthma
- and other health problems [16].
E-waste management

✓ Improper management
  ✓ has been found to result in adverse effects on the environment and health.
  ✓ may leach into soil or water and tap into household water sources or contaminate food chain.
✓ A study conducted in Ghana suggests that contaminated water has the potential to kill aquatic life [17].
E-waste management in developing countries

- Particularly African countries were found to manage e-waste in an environmentally unfriendly manner.
- Findings are disturbing given the dangers of e-waste on the environment and wellbeing [18, 19].
Factors of improper management in African countries.

✓ E-waste regulation is absent and if any, is laxer.
✓ The legislation issue is also characterised by failure of the International regulation—Basel Convention
  ✓ to be not binding and allowing loopholes for illegal e-waste trade [20].
✓ Babatunde [21] argues that illegal trade is motivated by poverty and corruption.
Discussion

1. A relatively brief examination of the various benefits of mHealth was presented.

2. An extensive review of the potential environmental and wellbeing hazards associated with discarded or unwanted mHealth waste.

3. Electronic waste generated by these mHealth devices could result into adverse health and ecological consequences if not managed properly.
Conclusion

- The transformative power of mHealth cannot be ignored.
- There is more evidence-based work needed on how mHealth advances the healthcare in developing nations, especially in the African region.
- mHealth has been found instrumental in educating and informing both rural and urban communities in health-related matters.
- SMS service has been identified as significant in reshaping how healthcare is seen in African context.
- The downside is the management of obsolete mHealth equipment.
- In the African region management of e-waste is inadequate.
- E-waste is both valuable as well as being toxic and harmful.
- This paper suggests awareness about the detrimental effects of e-waste on health and ecology
References

Thank You for Your Attention