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Research Protocol

Oncology Section

Protocol for a Systematic Review of Mobile Phone Technology for Managing Side Effects of Chemotherapy in Cancer Patients: A Research Protocol

UPPU PRAVEEN[1], M MANICKAVASAGAM[2], SJ NALINI[3]

ABSTRACT

Introduction: Mobile phone technology is an evolving trend in the medical field for rendering health-related care services to the needy. Chemotherapy is one of the cancer treatments which leads to certain side effects. These side effects can be managed well with the help of mobile phones, which became an essential thing in our life in recent decades.

Aim: To identify the efficacy of using mobile phone technology for managing side effects associated with chemotherapy and improvement in quality of life.

Materials and Methods: A systematic review will be conducted on randomised control trials and non-randomised control trials. In this review, Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) will be followed and a literature search will be conducted in PubMed-Medline, CINHAL Cochrane Library, Scopus, Science Direct, Ovid, J-Gate, and Trip databases. The literature search for this systematic review will be done on studies published between 2007 and 2019. The quality of the study will be assessed by the JBI clinical appraisal checklist for Randomised Controlled Trials (RCTs) and Non-Randomised Controlled Trials (Non-RCTs). Studies will be included based on predetermined inclusive criteria like studies published in the English language, with keywords like cancer patients, smartphone/android applications, chemotherapy, quality of life.

Results: A descriptive synthesis of the findings of the selected studies will be carried out which will be presented in a narrative summary with statistical findings incorporated.

Conclusion: This review will provide up-to-date evidence to support or oppose the hypothesis that mobile phone technology plays an effective role in managing side effects associated with chemotherapy and improve the quality of life of cancer patients.

Keywords: Android applications, m-health, Quality of life, Smartphone

INTRODUCTION

Mobile phone technology is an emerging trend of everyday life, which has its role in every field of especially in the healthcare system in the care process for better disease management and delivery of health interventions [1]. Cancer is the second leading cause of death and caused an estimated 9.6 million deaths in 2018 [2]. Worldwide, around one in six deaths is because of cancer. Cancer has become an important public health issue and one of the highest health priorities [3].

Chemotherapy is one of the treatments of choice for cancer and side effects are very common among cancer patients who underwent chemotherapy. These side effects result in alteration in physical, psychological and social milieu results in various manifestations like fatigue, loss of appetite, nausea and vomiting, diarrhea, constipation, insomnia, dyspnea, dry mouth and mouth sore, pain, bladder, and urinary problems impact on cancer patient's quality of life [4]. In recent decades, the healthcare team and organisations are paying much attention to using mobile phones in rendering healthcare services [5]. Control of the side effects of chemotherapy is one of the key components of chemotherapy adherence [6].

Cancer patients are not having enough knowledge to manage chemotherapy side effects at home [7]. There is a need to develop and implement an innovative method with the help of information technology to manage and control the side effects associated with chemotherapy. Mobile phone-based systems like using apps/m-health or e-health services are one of the best solutions to help cancer patients by providing quick access for self-monitoring of chemotherapy side effects and manage these symptoms by themselves at home by following app-based intervention or guidelines provided through apps, which can ultimately improve the quality of life of cancer patients who are under chemotherapy [8]. This review aims to identify how far this incorporating mobile phone technology (with the help of apps/m-health or e-health) will help the patients and healthcare team in managing side effects and improving the quality of life of chemotherapy patients.

MATERIALS AND METHODS

This review will be following PRISMA guidelines. This protocol has been registered at the International Prospective Register for Systematic Reviews (Prospero Registration No- CRD42020152520).

Search Strategy

The literature search for this systematic review will be done on studies published between 2007 and 2019, restricted to the English language and will follow three steps.

1. The initial search will be conducted in PubMed-Medline, CINHAL plus databases with keywords like cancer patients, chemotherapy, mobile application, mobile apps, side effects, symptom management, quality of life.

   P- Oncology Patients/Chemotherapy cancer patients/Oncology patients

   I- Mobile-based interventions (Apps-based interventions or guidelines to manage the side effects of chemotherapy)

   C- Routine care

   O- Manage the side effects associated with chemotherapy and improve the quality of life.

The retrieved studies titles and abstracts will be searched for any other relevant keywords.

2. A comprehensive search will be conducted with additional keywords in databases like Cochrane Library, Science Direct, Scopus, Ovid, J-Gate, Trip databases along with PubMed-Medline, CINHAL plus databases.
3. In the final step, the key articles reference lists will be searched for additional studies.

Inclusion Criteria

The following criteria will be used for including the studies for this review.

a) Articles published in peer-reviewed journals.

b) Studies available on electronic databases.

c) Study design: Randomised control trials and non-randomised control trials.

d) Intervention: Studies consisting of mobile phone technology-based interventions like mobile application/apps, technology-based information, or guidelines as the main variable will be included in the study.

e) Population: Adult cancer patients age >18 years, across all types of cancers, gender, race, regions, and country.

f) Settings: Conducted in rural or urban areas or hospitals or oncology units or clinical settings

g) Outcomes: Studies will be included if they describe either a few or all of the side effects of chemotherapy like nausea, vomiting, pain, mucositis, fatigue, sleep disturbances, diarrhea, constipation, dyspnea, urinary problems, and quality of life.

h) Language: English

i) Studies that have terms like android phone apps, mobile apps, smartphone applications, m-health services, symptoms of chemotherapy, or cancer treatment will be included.

Exclusion Criteria

a) Conference abstracts, databases containing only abstracts, books and grey literature will be excluded.

Screening

The search articles will be uploaded in Zotero software and duplications will be removed. In the screening process, the first titles and abstracts of the articles will be screened by the two authors as per the relevance to the review topic. Following this full-text screening will be done as per eligibility criteria. The screening process at both levels (abstract and full text) will be done independently by the two authors and during this process of screening, if any disagreements arise will be resolved by discussion and if necessary in consultation with the third author.

Quality Assessment of Screened Articles

All the selected articles will be judged for their quality based on JBI [9] (Joanna Briggs Institute Manual) clinical appraisal checklist for RCTs and Non-RCT. The quality appraisal will be done by two reviewers independently and any disagreement will be sought out by consulting the third reviewer.

Data Extraction

The data extraction tool recommended by the Joanna Brigg's Institute (JBI) manual will be used for extracting data from the screened studies [9].

RESULTS

The findings of the studies will be collected under the review objectives as ordered in the review protocol. A descriptive synthesis will be carried out and will be presented as a narrative summary in a tabular form. Both narrative descriptions, as well as statistical findings of studies, will be used in the summaries. The meta-analysis will be done for the quality of life in this review. The certainity of the evidence will be assessed by using GRADEpro [10].

DISCUSSION

Cancer patients experience a variety of symptoms that can be physical or psychological. They are the result of the illness or side effects of the treatment and can persist for a long period. These side effects need to be monitored continuously and cancer patients need supportive care in managing these symptoms. Mobile-based technology linked to a server that works as a real time self-assessment of symptoms associated with chemotherapy among colon cancer patients, worked well to manage the symptoms by themselves and increase the confidence in both healthcare team and patient's approach in chemotherapy symptom management [4]. Use of text messaging (SMS) for managing side effects of chemotherapy reduced the side effects among the cancer patients who received information through messages compared to who didn't receive information. This kind of text messages may be a better tool for side effects management among cancer patients [7]. Knowledge of the patients on managing side effects associated with chemotherapy can be improved and the patient's rate of utilisation of mobile-based technology can be increased with better evidence [8]. This lacune between knowledge and adherence to mobile-based technology among patients can be fulfilled with supportive evidence. Moreover, this review will be able to discuss the methodological strength and efficacy of using mobile phone technology in managing side effects experienced by chemotherapy patients.

CONCLUSION(S)

This review will help the healthcare team to understand the importance of incorporating mobile phone technology in the form of android/smartphone apps in delivering supportive care services to cancer patients to minimise their sufferings associated with cancer treatment and improve their quality of life and to identify the gaps in the existing literature and suggests the areas for carrying further researches.

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PARTICULARS OF CONTRIBUTORS:
1. Ph.D Scholar, Faculty of Nursing, Sri Ramachandra Institute of Higher Education and Research (DU), Chennai, Tamil Nadu, India.
2. Professor and Head, Department of Medical Oncology, Sri Ramachandra Institute of Higher Education and Research (DU), Chennai, Tamil Nadu, India.
3. Professor and Principal, Faculty of Nursing, Sri Ramachandra Institute of Higher Education and Research (DU), Chennai, Tamil Nadu, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Mr. Uppu Praveen,
Research Scholar (Nursing), Sri Ramachandra Institute of Higher Education and Research, Chennai-600116, Tamil Nadu, India.
E-mail: uppupraveenkumar@gmail.com
ORCID ID: https://orcid.org/0000-0002-1148-8588

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