DISSERTAION

in

BAJAJ FINSERV HEALTH,PUNE

(15th March -15th June)

Study on Smartphone apps for cancer: Analysis of the digital health marketplace

By

PRERNA

(PG/20/051)

Dissertation submitted in partial fulfillment of requirements of the degree PG Hospital and Healthcare Management (2020-2022)

International Institute of Health Management Research New Delhi

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Prerna

PGDHM

IIHMR DELHI

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Prerna, a PGDM (Hospital and Health Management) student from the International Institute of Health Management Research in New Delhi, completed an internship with Bajaj Finserv Health in Pune from March 15 to June 15, 2022.

The applicant completed the study assigned to her during her internship training satisfactorily, and her approach to the subject was sincere, scientific, and analytical.

The internship fulfils the course requirements, and I wish her the best of luck in her future endeavors.

Dr. Sumesh Kumar

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Certificate of Approval

The following dissertation titled "**Study on smartphone apps for cancer: Analysis of the digital health marketplace**", at **Bajaj Finserv Health, Pune** is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of PGDM (Hospital & Health Management) for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation.

Name	Signature
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Dr. Anuj Kr. Pandey (SRD)	
Dr. Ankur Kathuria	

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled Study on "Smartphone apps for cancer: Analysis of the digital health marketplace" submitted by **Ms.Prerna** Enrollment No. PG/20/051 under the supervision of **Dr.Nishikant Belle** for award of PGDM (Hospital & Health Management) of the Institute carried out during the period from15th March to 15th June, 2022. Embodies of my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Signature

Certificate from Dissertation Advisory Committee

This is to certify that Ms Prerna a graduate student of the PGDM (Hospital & Health Management) has worked under our guidance and supervision. She is submitting this dissertation of titled "Study on smartphone apps for cancer: Analysis of the digital health market place" in partial fulfilment of the requirements for the award of the PGDM (Hospital & Health Management).

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.

Dr. Nishikant Belle

Associate Professor

IIHMR, Delhi

Mr.Umang Anand

Manager

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Internship Certificate

To Whomsoever It May Concern

This is to confirm that **Prerna** is working in Bajaj Finserv Health, As **"Relationship Manager"** .

Important Information as per our records:
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This letter is issued on the request of the Intern.

Regards,

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FEEDBACK FORM

Name of the Student: Prerna

Dissertation Organization: Bajaj Finserv Health , Pune

Area of Dissertation: Study on smartphone apps on cancer

Attendance: 100%

Objectives achieved: Yes

Deliverables: Prepared a review article -Study on smartphone apps for cancer – Analysis of the digital health marketplace

Strengths: She is committed and dedicated in producing information on time .She is a strong communicator who actively contributed ideas for improvement and was always willing to take on additional challenges

Suggestions for Improvement: If there is anything she can improve ,it is that she should continue and never cease in maintaining the traits and skills she possess .

Mr.Umnag Anand

Manager

Bajaj Finserv Health

Date: 15th June

Place: Pune

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LIST OF ABBRIVATION

ABBRIVATION	FULL FORM
EMI	Equated Monthly Instalment
OPD	Out Patient Department
IPD	In Patient Department
BMI	Body Mass Index
NCBI	National Center for Biotechnology Information
AYA	Adolescent to Young Adult

LIST OF TABLES

CHAPTER -1

OVERVIEW OF COMPANY

1.1 Introduction

Bajaj Finserv Health is a healthcare app that provides everyone with individualized healthcare services. Bajaj Finserv Health allows users to find top doctors in their area, make appointments, set medication or immunization reminders, keep all of their health records in one place, and more.

It is a health-tech firm owned by the Bajaj Finserv Group, whose mission is to provide everyone with preventive, tailored, and prepaid healthcare.
Bajaj Finserv Health Limited is a health management platform that serves as a facilitator in the healthcare ecosystem by connecting consumers to a large network of service providers and utilizing cutting-edge technology to improve their health.

1.2 Mission

By making healthcare Prepaid (insurance), Preventive, and Personalized, users would be able to gain access to and finance healthcare. As a result, health outcomes are improved and healthcare management expenses are reduced.

1.3 Vision

Become the largest payer in the healthcare ecosystem, including spending on hospitalization, diagnostics, and doctor consultations.

1.4 Features and benefits of Bajaj Finserv Health

1. Get personalised healthcare plans and packages

Bajaj Finserv Health tailors healthcare plans for you and your family, from preventive health check-ups and online doctor/medical consultations to health insurance and full body check-ups.

2. Find the best clinics near you

Doctors with diverse specialties, such as general practitioners, cardiologists, dentists, pediatricians, dermatologists, and more, can be found in and near your area. You can search for doctors by name, clinic, specialty, or health concerns/symptoms.

3. Book appointments the hassle-free way

Make an appointment with your preferred doctor to avoid huge lines at clinics or hospitals.

4. Consult doctors online via telemedicine

You may obtain a doctor consultation through video from the comfort of your own home with Bajaj Finserv Health. Without the trouble and risks of visiting to the hospital, you can get your prescription using the app.

5. Get COVID-19 care at home

Find a COVID-19 testing facility near you, schedule your COVID-19 tests, and speak with our COVID-19 expert to determine your COVID-19 risk. Here's where you can find out if you're at risk for COVID.

6. Store your Personal health records in our 'Health Vault'

Prescriptions, blood test results, medical history, and health information like BMI and vitals can all be stored in one place. As needed, you can share these with your doctor and laboratory.

7. Know your health score and track fitness

For a healthier lifestyle, you can also create and track daily exercise objectives such as steps, distance, and calories.

8. Schedule your health reminders

Make a mental note to remember to take your prescribed medication on time. You can also see your children's recommended vaccines and receive reminders for them. You may also keep track of your planned appointments on Bajaj Finserv Health.

9**. Access multiple benefits with various health membership cards**

You can save money on OPD, IPD, diagnostics, pharmacy services, and more by using your health cards, such as the Ruby Hall Membership card.

1.5 AIM OF COMPANY -

1. A health-tech solutions company focused on improving consumer health outcomes through smarter, more connected, and holistic care.
2.Introduces 'Aarogya Care,' an industry-first solution that provides a variety of personalized, preventive, and prepaid healthcare packages.
3.'Aarogya Care' connects the different complimentary components of the health ecosystem using a mobile-first strategy.
4. It aspires to enable easy access to high-quality, affordable healthcare at any time and from any location.

1.6 Core offering of Company

Bajaj Finserv Health, the new company, introduces its key service, 'Aarogya Care,' an industry first product that offers consumers preventive, personalised, and prepaid health care packages. 'Aarogya Care' connects the numerous complementing components of the health ecosystem with a mobile-first strategy to enable easy access to quality and affordable healthcare, anytime, anywhere. The Bajaj Finserv Health App, which is powered by the newest developments in digital health technology, acts as a personal health manager, providing users with a one-stop shop for convenient, connected, and cost-effective health solutions. It also allows customers to obtain and keep health records in a digital format, which is integrated with the National Health ID.

To safeguard consumers from unanticipated high medical costs, the comprehensive package includes health insurance coverage from Bajaj Allianz General Insurance and a pre-approved

Health EMI facility from Bajaj Finance Ltd. The company has now signed up 112 hospital partners that operate 200 hospitals across India, as well as 3 diagnostic and laboratory centers with 671 customer touch points and over 9,000 clinicians. These network partners will deliver the health-care services.

CHAPTER 2 PROJECT OUTLINE

SMARTPHONE APPS FOR CANCER: A CONTENT ANALYSIS OF THE DIGITAL HEALTH MARKETPLACE

2.1 AIM: The goal of this research is to evaluate the state of cancer-focused smartphone apps in the digital health market. Interactive features, content sources, developer affiliations, and health provider oversight of app content were all investigated. A number of significant findings were revealed as a result of this research.

2.2 RESEARCH QUESTION

1) How can the state of smartphone cancer apps for the general public be assessed, with a focus on interactive features, content sources, and developer affiliations?

2) How to figure out how much of a role health providers have in screening or evaluating application material.

2.3 OBJECTIVE OF THE STUDY

1) To assess the current state of public-facing smartphone cancer applications, with an emphasis on interactive features, content sources, and affiliations with application developers.

2) To determine the extent to which health providers are involved in terms of screening or evaluating application content.

2.4 RESEARCH METHODOLOGY

• **Research Design**: Descriptive Study

- **Data Type**: Secondary data

- **Data collection Method**: Literature Survey

Data was gathered and reviewed after searching through many research articles from sources such as PubMed, Google Scholar, Research Gate, Published articles, News articles, Wikipedia, and NCBI articles between the years 2000 and 2021.

Sources: Published articles, news stories, PubMed, Google Scholar, Research Gate, Wikipedia, and NCBI articles are all examples of sources.

Search Terms: Cancer, Applications, Devices, , Diagnosed ,Oncology ,Features

2.5 INTRODUCTION

Cancer is a disease in which some of the body's cells grow out of control and spread to other places. Cancer can develop in almost any part of the body. In response to the body's needs, human cells expand and make new cells. As cells age or become harmed, they die and are replaced by new cells. Cancer can be treated more effectively if it is diagnosed early. Health applications are increasingly being employed for patient care in oncology. Because of the rising use of mobile devices, healthcare consumers now have quick access to information regarding cancer prevention, detection, and treatment choices on their handheld portable devices.

Health apps, in particular, enable cancer patients, their families, and caregivers cope with life-altering cancer experiences by providing health-related services, interactive tools, & support via smartphones or tablet devices.

In many nations, mobile phone-based technology has become a vital element of the healthcare system, with mobile health, smartphone apps, and program providing health services to the underserved. Cancer is expected to kill roughly 10 million people worldwide by 2020. There are various cancer treatment options, and chemotherapy is one of the most

commonly used. Chemotherapy's nature is to kill cancer cells while also killing healthy cells, resulting in the development of certain side effects.

Nausea, vomiting, exhaustion, diarrhea, difficulty of sleep, loss of appetite, discomfort, and hair loss are the most typical adverse effects of chemotherapy. These side effects have an impact on cancer patients' quality of life and might cause psychological anguish.

In the healthcare industry, the use of mobile phone-based technology is on the rise. One of the most difficult challenges for cancer patients is a lack of knowledge on how to handle these side effects at home. Because mobile phones/smart phones have become such an important part of our lives, this problem can be handled with the help of mobile-based technologies. To treat chemotherapy-related side effects, mobile-based technologies, such as smart phone apps/mHealth services, can deliver information in the form of guidelines, instructions, or education to cancer patients.

A review published in 2018 proposed that more extensive interventions using mobile technology be developed to suit the needs of patients in the form of guidance and self-monitoring of chemotherapy side effects. By minimizing the symptom burden of chemotherapy, the use of mobile technology for self-care monitoring and reporting of symptoms, as well as alert systems that focus on severity of symptoms, can improve the living quality of cancer patients.

There are no existing meta-analyses on the intervention of using mobile phone technology and its efficacy to improve the living quality of cancer patients, according to the background information and our knowledge.

The findings of this analysis will provide insight and assistance for the development of novel mobile-based interventions for improving quality of life in the form of mobile apps/applications. This review was conducted in order to improve the evidence base for determining clinical outcomes of patients using mobile phone technology. The goal of this review is to gather information on the effectiveness of mobile phone technology in managing chemotherapy side effects and enhancing cancer patients' quality of life.

CHAPTER -3 REVIEW OF LITERATURE

In a research titled "Smartphone apps for cancer: A content analysis of the digital health marketplace," by Deborah H. Charbonneau et al. in year 2020 proposed that, our primary responsibility of caring for patients, we should also learn and develop. This research provides an updated review of cancer-related apps accessible on the digital health market. The findings have implications for the quality of information and supportive resources available to cancer patients. In screening application material, more transparency regarding content sources, organizational affiliations, and the extent of health care control is required. There are also suggestions for increasing the quality of cancer applications.

According to the study "Publicly available apps for cancer survivors: a scoping review," by Rosalind Adam et al., in year 2019 found that "Apps are already available via on-line stores that cover a wide spectrum of cancer survival activities." Further research into the effects of such apps on clinical consultations, patient work/burden, and clinical results is needed. The majority of apps are created by for-profit companies, and the promise of empowerment in the "battle" against cancer is balanced by the risk of exaggerated claims and exploitation.

According to a study done by Javier Navarro-research Alamán's et al., in year 2020 on the topic "An App for Monitoring Cancer Patients with Enriched Information from Interaction Patterns." According to the findings, the app made it easier for medical personnel to acquire crucial data regarding the ailment than if they had to do so manually. We intend to investigate how therapy improves and how waiting times for face-to-face consultations are decreased in the future.

Another study, "Early breast cancer chemotherapy-related symptom reporting and management via mobile applications," done by Grayna Suchodolska et al., in year 2020 stated that "rapid development of digital technologies resulted in a wide variety of mobile and

Webb applications (apps) being used in cancer care for screening, diagnostic, therapeutic, and educational purposes." Mobile applications are viable and have the potential to improve cancer symptom monitoring. More study is needed, however, to evaluate these resources and ensure their efficacy and safety for their consumers.

According to a 2017 study titled "Mobile Phone Apps for Quality of Life and Well-Being Assessment in Breast and Prostate Cancer Patients: Systematic Review" by Esther Rincon et al. There are a lack of rigorous trials regarding the QoL and/or well-being assessment in breast and/or prostate cancer patients, despite the existence of hundreds of studies involving cancer-focused mobile phone apps. All health care practitioners should work together to identify cancer-focused apps that are helpful, accurate, and dependable tools for cancer patients' illness management.

Praveen Uppu et al. conducted another study named "Efficacy of Mobile Phone Technology for Managing Side Effects Associated with Chemotherapy among Cancer Patients." "The data of this systematic review and meta-analysis suggested that mobile phone-based therapies aid to improve the quality of life among cancer patients by decreasing the side-effects associated with chemotherapy," the researchers found in 2017. Because more people are using mobile phones/smart phones, using mobile phone technology into the delivery of health services is becoming much easier.

According to a study conducted by Kerstin A Kessel et al.in year 2016 on the topic "Mobile Apps in Oncology: A Survey on Health Care Professionals' Attitude Toward Telemedicine, mHealth, and Oncological Apps." stated that A majority of HCPs are in favour of telemedicine and the usage of oncological apps and patients,Assessing side effects can result in a faster response and, as a result, a lesser level of inconvenience for patients. Clinical data such as life satisfaction and treatment satisfaction could be used to assess and improve the therapy workflow. Because they are in constant communication, a mobile app would eventually improve the patients' relationship with their treating department.

According to a study conducted by Debi Fischer et al. in year 2020 on the topic "The New Normal: Cancer Apps," states that the oncology patients and nurses are experiencing increased stress in today's COVID-19 pandemic environment. When patients are admitted,

the nurse caring for them requires immediate access to information about their cancer diagnosis. They can use online apps to aid their study. The patient can also use the app to access and interact with the platform.

CHAPTER -4 RESULTS

The purpose of this study was to evaluate the state of cancer-related smartphone apps for healthcare consumers. The most popular category for the primary usage of the 123 cancer applications was education, followed by disease management.

To locate acceptable cancer-focused apps for the study, researchers searched the Apple iTunes (iOS) and Google Play (Android) platforms. Keyword searches for the terms "cancer" and "oncology" turned up apps from the two major mobile marketplaces. These methods were created in previous research and implemented to aid in the selection of acceptable apps for the study from the app stores. In this study, the term "cancer" refers to a category of diseases in which “aberrant cells divide out of control and infiltrate surrounding tissues.”

Cancer apps included interactive features such as the ability to manage appointments, share medical records, and connect with a health professional. These interactive components, on the other hand, were underutilized, and there is still room for improvement to enable self-monitoring functions in this area. Only a few cancer apps on the market stated that app content had been verified by a health provider, and information sources were not always acknowledged. These findings have ramifications for the quality of cancer resources and information. To boost smartphone users' resources, the digital health marketplace should use more detailed information about both organizational links and the level of health practitioner involvement or monitoring.

With the rising sophistication of mobile devices and app-delivered interventions that can capture minute aspects of user involvement, more sophisticated frameworks to make sense of user engagement data are required. In this study, we used machine learning to offer a method for analyzing the dynamic relationship between app engagement and mood. Importantly, the

way engagement data is analyzed varies every study. Cheung et al [46] and Pham et al [52] drew attention to these various data-processing methodologies as well as the similar characteristics that characterise involvement in their investigations. Our method aims to bring the important elements of these approaches together and refocus them on data from breast cancer patients.

Table 1 : Apps made for different types of Cancer

	Google Play (Android)	Apple iTunes (iOS)	Number of apps (percentage)
Cancer in general	37	25	62 (50%)
Breast	12	7	19 (15%)
Skin	3	5	8 (7%)
Colorectal	4	0	4 (3%)
Pediatric	2	2	4 (3%)
Lung	4	0	4 (3%)
Prostate	4	0	4 (3%)
Throat	3	1	4 (3%)
Kidney	1	1	2 (2%)
Oral/mouth	2	0	2 (2%)
Appendix	1	0	1 (1%)
Balder	1	0	1 (1%)
Bone	1	0	1 (1%)
Brain	1	0	1 (1%)
Cervical	1	0	1 (1%)
Eye	1	0	1 (1%)
Liver	1	0	1 (1%)
Pancreatic	1	0	1 (1%)
Stomach	1	0	1 (1%)
Thyroid	1	0	1 (1%)
Total	83	40	123

When I did some research on cancer applications, I discovered that there are a total of 123 apps (Apple iTunes = 40; Google Play = 83). Approximately half of the apps in the study sample (50 percent, or 62/123), focused on cancer in general. Apps for breast cancer (15 percent, or 19/123) and skin cancer (7 percent, or 8/123) were next.

The majority of the cancer applications (93 percent, 115/123) were free to download, whereas eight (7 percent, 8/123) were paid apps. All eight apps were commercially accessible for a price. Apple's iTunes store offered 35 free apps and five paid products (ranging from $2.99 to $6.99). Similarly, the Google Play store included 80 free apps and three paid apps with prices ranging from $3.99 to US$28.99.

Table 2: Different features of app for cancer

Feature	Percentage (number of apps)
Ability to track symptoms, side effects, treatments, and chronic pain	20% (25/123)
Self-exams and skin/mole tracking	10% (12/123)
Ability to track appointments	9% (11/123)
Ability to upload and share photos	4% (5/123)
Ability to connect with health providers	4% (5/123)
Supports sharing updates on social media	4% (5/123)
Ability to share medical records via app	3% (4/123)

Apps were also evaluated for interactive features. With the capacity to track symptoms, side effects, medications, and chronic pain, cancer apps aided overall cancer management (20 percent, 25/123). Self-examinations and skin/mole tracking were available in a handful of cancer

applications (10 percent, 12/123). Treatment and aftercare were also aided by apps, which allowed users to log visits (9 percent, 11/123). As demonstrated in Table 2, just a few applications permitted users to upload and share photographs on their mobile devices (4 percent, 5/123). The ability to share medical records via mobile devices (3 percent, 4/123) and contact with health experts (4 percent, 5/123) were also only supported to a limited extent.

CHAPTER - 5 LIMITATION

Limitations and future direction -

To begin, researchers used keyword searches for the terms "cancer" and "oncology" to locate appropriate apps for study participation. Other apps that may be valuable to cancer patients but were not easily found using these search terms are possible.

The study was limited to the app descriptions offered in the two stores, and the analysis was also based on app marketplace descriptions. Furthermore, the cancer apps were never downloaded or evaluated. In future studies, a more complete app evaluation would be beneficial. Nonetheless, this exploratory work serves as a good starting point for future research. Future research could look into the app's usability and the accuracy of the medical content. Focus groups could provide information on the cancer apps' navigation and other usability elements. Similarly, based on the best available clinical data, a panel of health professionals may assess the quality of medical content for apps.

CHAPTER -6 RECOMMENDATIONS

1) As Cancer is a condition in which some cells in the body grow out of control and spread to other parts of the body. Early detection improves cancer outcomes by allowing patients to receive treatment at the earliest feasible stage, and is thus an important public health approach in all settings. As a result, health apps are increasingly being used in cancer for early diagnosis and patient care. Healthcare consumers now have fast access to information about

cancer prevention, detection, and treatment options on their handheld portable devices, thanks to the increased use of mobile gadgets.

2) Evidence of Excellence: Due to an unknown risk of bias, the measured quality of life had a moderate grade of evidence

Only a few applications description mentioned that health workers would be engaged in screening as well as reviewing app content, and even fewer specified that health providers would create or analyses app content that is working groups or many health workers. Apps that claimed to include content created and approved by oncologists and registered dietitians, for example, were considered to have some kind of health practitioner involvement.

3) Online app store descriptions that are either poor or insufficient continuing to wreak havoc on the health app market.
According to some Researchers, categorising apps that fall under the medical device legislation may be used , be a means of regulating and controlling app quality.
There are currently no guidelines in place for health applications that educate or track your health; nevertheless, improving app store descriptions by giving clearer documentation about how app content is generated and reviewed would be an important first step.

4) Patients should search for information regarding how health material is created to see if it is based on scientific facts or unsupported claims, according to the American Cancer Society. This recommendation should be included into mobile app marketplace descriptions to more clearly clarify whether health app material is based on research findings and whether content has been evaluated by health experts with their credentials. As previously said, having a scientific board analyse app material is one way that is likely to result in more accurate and higher quality app content

5) Furthermore, cancer-related knowledge influences how people comprehend, evaluate, and utilise health information when making healthcare decisions. Mobile applications with a dictionary of properly defined cancer terminology have the potential to assist healthcare con-

sumers have a better understanding of new ideas and terminologies often used in the oncology field.

6) More completely exploiting social networking and self-monitoring features is a tip fOr app improvement. Previous research have found that smartphone apps that use social media to give real-time social support and ease the exchange of health-related data with health providers or peers are among the top benefits of health apps. Users have also indicated that self-tracking elements in apps that provide convenient tools for setting objectives are engaging and insightful for monitoring their progress.

CHAPTER -7 DISCUSSION & CONCLUSION

Users can contribute images, publish updates, share knowledge with family members and friends, and track side effects of chemotherapy using the interactive features of mobile apps. Only a few cancer apps allowed you to keep track of your visits, drugs, treatments, side effects, and chronic pain, which was alarming. Cancer prevention, detection, and self-management practices will not be aided by apps that solely focus on raising awareness or delivering cancer information. To be effective, apps that teach self-management skills and the social support needed to maintain desired behaviors must have integrated features.

Just a few cancer applications indicated that mobile users could access a glossary of words. This feature can aid people in improving their med vocab and can help define crucial language for consumers of health seeking for cancer related knowledge, but it is only offered in a few cancer applications. Although earlier study has found that breast cancer applications frequently fail to explain words for mobile users6, our data shows that the lack of dictionaries and glossaries in other cancer apps may be more widespread.

The majority of cancer applications omitted details about organizational affiliations and content sources. Credentials & abilities of individuals or organizations offering content are required to aid health consumers in judging the legitimacy and authority of information. Final-

ly, there was a notable scarcity of application details that had received critical acclaim. This gap could make it difficult for health consumers to locate credible information from cancer apps because few application infos disclosed the amount to which health experts were involved in monitoring or analyzing app material.

There are no ethical considerations with this research because it is secondary in nature. Because no patient data is collected, no consent was requested.

This study found that smart phone tech interventions (smart apps, mobile phone App-based interventions, or instructions for dealing with chemotherapy difficulties or mHealth services) reduced side effects/symptoms and improved chemotherapy cancer patients' quality of life.

Every study that showed that chemotherapy-related adverse effects were reduced and improved standard of living was included in our study; ten studies were published during 2007 & 2020. The outcomes of all of the studies were positive.

Online sellers currently sell apps that cover a wide range of cancer survivorship activities. There is a need for more research into the impact of such applications on medical consultations, patient job, and health outcomes. The majority of apps are developed by for-profit businesses, and the promise of empowering in the "fight" over cancer is counterbalanced by the possibility of false claims and fraud.

Four papers were included in this meta-analysis to investigate the effects of mobile phone technology interventions on cancer patients' quality of life. Two of the four studies revealed a significant increase in the quality, whereas the other 2 studies revealed an increase in the quality but not statistically significant findings. However, the aggregate results of all 4 samples demonstrated that cell phone technology treatments considerably improved people's quality of life.

According to this extensive study, the most common symptoms observed by oncology patient’s therapy were sickness, vomit, constipation, sores (oral microsites), weariness, and emotional effects like as depression and worry.

The findings of our systematic study were corroborated by earlier systematic reviews, which found that mobile phone technology treatments reduced chemotherapy side effects and enhanced cancer patients' quality of life. The findings of this analysis will drive healthcare professionals and organizations to create creative techniques utilizing mobile phone technology to assist cancer patients in self-managing the side effects of chemotherapy in their own homes. However, mobile phone-based technology alone may not enhance the well-being of cancer patients.

The data from this systematic review and meta-analysis suggested that mobile phone-based therapies can assist cancer patients enhance their quality of life by reducing the negative effects of chemotherapy. Because everyone is utilizing mobile phones/smart phones at an increasing rate, incorporating mobile phone technology into the delivery of health services is becoming quite simple. However, caution should be exercised while instructing people on how to use technology-based services properly. For effective adoption of mobile-based technological services for cancer patients, more high-quality evidence from studies is required.

Telemedicine and the usage of oncological apps by patients are supported by the majority of HCPs. Assessing side effects can result in a faster response and, as a result, a lesser level of inconvenience for patients. Clinical data such as life satisfaction and treatment satisfaction could be used to assess and improve the therapy workflow. Because they are in constant communication, a mobile app would eventually improve the patients' relationship with their treating department.

The use of mobile phone apps for health-related purposes is on the rise, and there are now thousands upon thousands of health apps available on the internet. They are used to treat a variety of illnesses, including cancer. Health applications offer a way to track psychological discomfort and quality of life in the context of cancer and its therapies. The scientific literature related to applications targeting breast or prostate cancer patients and involving QoL and/or well-being metrics is quite limited, according to our systematic review, as we only found articles that met the inclusion criteria. The quality and dates of publication, on the other hand, demonstrate a contemporary scholarly interest in this research area.

According to results from four of the six trials included in this study, patients who utilise authorised mobile applications during chemotherapy for early breast cancer had a better quality of life. Similarly, a game-based application named "Ilovebreast" was proven to improve QoL in metastatic breast cancer patients after chemotherapy. Increased patient education, better treatment compliance, and less physical side effects were additional benefits. Anxiety and sorrow, on the other hand, were unaffected. In adolescent and young adult (AYA) patients with non-specific malignancies, another game-based application with an integrated reward system was proven to improve pain-related outcomes (pain intensity, pain interference) and QoL. Mucositis, nausea, vomiting, tiredness, and sleep were all better monitored and managed when more AYA-related applications were used.

Generally, patients like the ease with which phone applications allow them to report and manage their symptoms. In a separate study, users' participation in the Interactor app was evaluated, and significant adherence to the app was discovered. Furthermore, daily symptom reporting was thought to be both useful and convenient, especially at the start of treatment. Both patients and clinicians in the PRO-TECT study agreed that another digital system for remote monitoring of patients' symptoms throughout cancer treatment was highly acceptable. In a pilot study of breast cancer survivors, the use and satisfaction of an electronic symptom and adherence monitoring app revealed improved drug compliance and higher satisfaction with communication and follow-up in the intervention group compared to the usual care group, but there was no significant difference in anxiety scores.

CHAPTER – 8 REFERENCES

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