REMOTE CARDIAC REHABILITATION PROGRAM SERVING INDIVIDUAL RECUPERATING FROM ACUTE CORONARY SYNDROME (ACS), HF (HEART FAILURE), CAD (CHRONIC CORONARY DISEASE)

Dissertation Submitted to

The IIHMR University, Jaipur

for the partial fulfilment for the award of the degree of

Master of Business Administration (MBA)

in

Pharmaceutical Management

By

Purnendra Sahu

Under the Supervision and Guidance of

Dr. Sudhinder Singh Chowhan

2024

Date: 4th July 2024

CERTIFICATE

This is to certify that Mr Purnendra Sahu in partial fulfilment of the requirements for the award of the degree of MBA (Hospital and Health Management)/MBA (Pharmaceutical Management)/MBA (Development Management) from the IIHMR University, Jaipur has successfully completed his internship at **Lupin Digital Health Limited** during April to June 2024

For Lupin Digital Health Limited

Nimish Ramesh
Sr. Manager - HR

IIHMR UNIVERSITY, JAIPUR

DECLARATION BY STUDENT

I, **Purnendra Sahu** Enrolment No. IIHMR-U/02/2022-24/0420 hereby declare that this dissertation is titled **Remote Cardiac Rehabilitation Program Serving Individual Recuperating from Acute Coronary Syndrome (ACS), HF (Heart Failure), CAD (coronary artery disease)** record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

Name of Student: Purnendra Sahu
Date:

IIHMR UNIVERSITY

CERTIFICATE

This is to certify that the dissertation titled **Remote Cardiac Rehabilitation Program Serving Individual recuperating Acute Coronary Syndrome (ACS), HF (Heart Failure), CAD (coronary artery disease)** from a record of the research work undertaken by Purnendra Sahu in partial fulfillment of the requirements for the award of the degree MBA (Pharmaceutical Management) from the IIHMR University, Jaipur under my guidance and supervision and his/her approach to the research study has been sincere, scientific, and analytical.

29/6/24

Dr. Sudhinder Singh Chowhan
(Faculty Guide)
IIHMR University, Jaipur

Date: 29/6/24

29/06/2024

Dr. Manthan D. Janodia
(School Dean)
IIHMR University, Jaipur

Date:

1, Prabhu Dayal Marg, Near Sanganer Airport, Jaipur- 302029, Rajasthan, India.
Ph : 0141-3924700, 2791431- 32 E-mail: iihmr@iihmr.edu.in Web : www.iihmr.edu.in

TABLE OF CONTENT

Acknowledgment

It brings me great pleasure to thank my mentor**, Dr. Sudhinder Singh Chowhan (Associate Professor, IIHMR University)**, for his support and encouragement during my dissertation; it is his consistent encouragement that has enriched my development as an intern.

I'd also like to thank my university's School Dean**, Dr. Manthan D. Janodia**, **IIHMR University, Jaipur** for his support. I am grateful to them for providing important guidance throughout the examination, his recommendations, valuable suggestions, optimistic and strong demeanor, and unwavering support, without which the endeavors would not have been possible to complete.

I would extend my vote of thanks to the Dr. Sudhinder Singh Chowhan who gave me the guidance and support during my internship.

I hope that, in the future, I will be able to draw on my expertise and skills to make a useful contribution to the industry.

Abstract

The report examines the topic Remote cardiac Rehabilitation program serving individual recuperating with ACS (Acute Coronary Syndrome), HF (Heart Failure), CAD (coronary artery disease) using secondary data and provides overview of Digital Therapeutic market of cardiac Rehabilitation. This Explain how this development and progress of this Sector is taking place. The digital Therapeutic market and Indian company is rapidly growing with the vision for patients suffering from Cardiac illness which holds the foundation and, application is an important component of the study.

The Market Segmentation of Digital Therapeutic how much scope we have in this industry, which immediately corresponds with us and leads us to the question of how much we can investigate and where we stand in this field. The Impact of deaths due to cardiac illness outlines how the market has fluctuated and how this market has demonstrated its potential to influence business and present us with opportunities for Cardiac Health, allowing us to get Collaboration with Healthcare System.

The general trends of the Digital Therapeutic market with future impact and trends for prediction of the growth of Remote cardiac Rehabilitation Program in India is a general indicator that how fast this market is growing as the cost of program is much lower as compared to in Centre cardiac Rehab and this also leads to the fact that as the population grows and the cost of treatment goes lesser, this also impact the digital Health Market to attain its growth and opportunities in coming years.

Company Profile

Lupin Digital Health is an innovative health technology company, which is re-inventing healthcare using disruptive technology solutions. Founded to redefine healthcare norms through **Digital Therapeutics (DTx)**, this is a owned subsidiary of Lupin Limited, a global pharmaceutical giant. By leveraging cutting-edge technology, it optimizes patient outcomes, simplifies care delivery systems and boosts the overall state of health for everyone.

This shows how much they are serious about integrating advanced digital technologies into the healthcare system by establishing Lupin Digital Health in 2021.

Location

Lupin Digital Health Head Quarter - Kalpataru Inspire, 3rd Floor, Off Western Express Highway, Santacruz (East), Mumbai – 400 055

Workforce Size

To realize its goals and objectives, the company engages more than 300 professionals including medical professionals and software engineers as well as data analysts and operatives who work together to guide the company's development programs.

Mission

Digital tools and data-driven insights that enable better management of health, personalized treatment decisions and proactive care are what we aim at giving patients and doctors as our mission. We aim to bring together traditional medicine with modern technology so that all people can easily access good processional healthcare services.

Vision

To be a global leader in digital health, driving a future where technology and healthcare seamlessly integrate to provide care and enhanced quality of life for individuals worldwide.

Key Offerings

Digital Therapeutics

The digital therapeutic is an evidence-based software program offered to prevent, manage and treat medical conditions.

Individualized therapy programs as well as monitoring for chronic diseases like diabetes, cardiovascular disorders or respiratory illnesses.

Telehealth Services

Lupin Digital health offers wide variety of telemedicine packages that will make it possible for you to reach healthcare giver right from your house or office.

Secure video conferences, remote diagnostics and e-prescriptions so as to have a seamless patient interaction and flexibility.

Health Monitoring Devices

Lupin digital health has blood pressure monitoring machine, contemplative weight machine and ECG machine connected to Lyfe app for vitals recording

Also performs real-time data tracking and analytics that produce actionable health insights in order to boost patient adherence.

Patient Engagement Platforms

It contains interactive platforms specifically designed for patients' education, involvement, and support purposes.

Tracks heath metrics, gives reminders, and provides access to personalized content on health among others

Data Analytics and AI Solutions

Utilizes advanced data analytics such as artificial intelligence in discovering important health information from existing medical database

Conducts predictive analysis; early diagnosis of diseases, risk stratification, treatment recommendations on individual basis.

Core Values

Innovation

We are committed to innovation in healthcare, technology and constant rethinking of the digital space to improve patients' health and wellbeing.

Quality

We need to ensure our offerings meet international standards of quality and safety.

Collaboration

We must build relationships with doctors and patients that help create a healthier society.

Integrity

Our services should be provided with the highest moral values.

Patient-Centricity

This is about putting the patient at the center, as every one of our activities must be driven by what is good for the patient.

Leadership

Lupin Digital Health has been established under the guidance of experienced individuals from diverse backgrounds such as health, medicine and technology. Their collective knowledge steers Lupin Digital Health towards its vision, which involves transforming digital health.

Worldwide availability

Digital Solutions are available globally through Lupin Digital Health's network in key markets. We commit ourselves to offer more services to different demographics while we make it possible for others who may not know us to access our services across various cultures worldwide thereby making them accessible globally.

Sustainability

Promoting favorable environment that will ensure long-term health. Our digital-based solutions aim at reducing costs associated with providing medical care, enhance cost efficiency as well as promote ecological friendly operations in this industry.

Contact Information

Headquarters: Mumbai, Maharashtra, India
Phone: 9130200600
Website: https://content.ldhlyfe.in/
LinkedIn: https://www.linkedin.com/company/lupin-digital-health/about/

Company Product and Services

Lupin Digital Health has Remote Cardiac Rehabilitation Program Called LYFE. It is India's first Evidence Based Clinically Evaluated Program for Treating, Managing and preventing diseases to improve heart health and Quality of life with the Tag line "**Keeping the Vital Connection alive"**

Cardiac Rehab is Clinically proven with the power of 5 Experts

LYFE CARE MANAGERS

Patient Assessment

Patient counsellors for greater than 3 years of experience
They understand your language then they advise you on the treatment and how to execute all the recommendations by The Doctor.

HEALTH COACH

Nutritionists who is Highly extra Weight expertise than Based 5 years Qualified They understand your likes based on regional dietary preferences to personalized a diet.
Nutrition Counselling
Blood Pressure Management
Lipid / Diabetes/Weight Management

CARDIOTHERAPIST

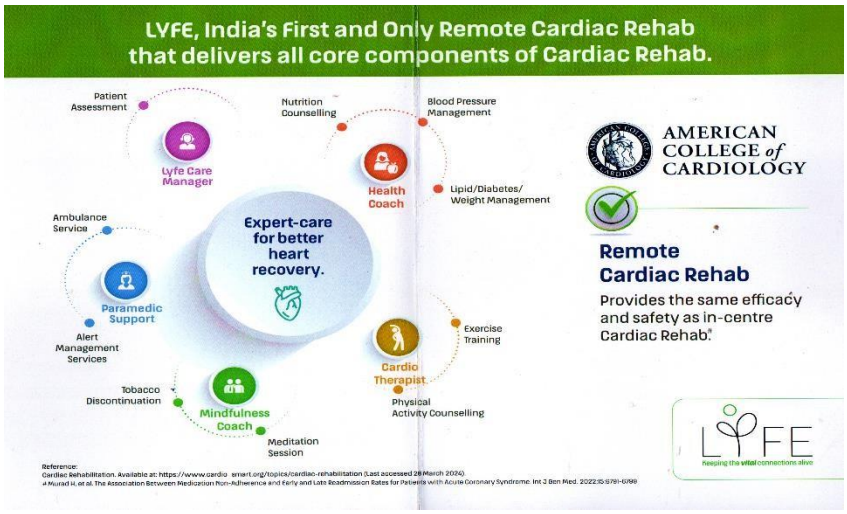
Cardiotherapist with more than 5 years of experience in the field They provide individualized exercise programs that aid in the enhancement of flexibility and functional abilities.
Exercise Training
Physical Activity Counselling

MINDFULNESS COACH

A mindfulness coach could help a person quit smoking by having them meditate when a craving hits and to cope with the stress of high cravings.
Meditation Session
Tobacco Discontinuation

PARAMEDIC SUPPORT

They are the medical professional with having 7 years of experience in medical emergency care who main job is to provide 24*7 Emergency services to the patients.
Off Range vital Readings and Ambulance Service



(Figure-01)

Global Guidelines across CV continuum

Remote Cardiac Rehabilitation program is a Recovery Program for patient suffering Acute Coronary syndrome, Heart Failure and Chronic Artery disease. Cardiac Rehab has high level of evidences across CV Continuum. As per the Global guidelines it is **Class 1A Recommendation** by all major Global Guidelines like:

WHO (World Health Organization)

The World Health Organization (WHO) has defined cardiac rehabilitation (CR) as a comprehensive care model comprises of the following basic components [1]: Organized workouts - Patient teaching - Psychosocial counseling - Minimizing risks and changing habits The purpose of CR is to improve the quality of life of a patient and decrease possibility of future heart issues here in. According to WHO (World Health Organization) cardiac rehabilitation programs must be individual for each patient and delivered by practicing nurses.

NICE (National Institute for Health and Care Excellence)

According to the National Institute for Health and Care Excellence (NICE) cardiac rehabilitation includes the following:

- ✓ Exercise, health education and lifestyle advice.
- ✓ Guiding Stress management.
- ✓ Encouragement to participate in the Rehabilitation programme.
- ✓ Engaging in home-based rehabilitation programme if needed
- ✓ Information guiding local and national patient support groups.
- ✓ Monitoring of secondary prevention drug treatments.

- ✓ Lifestyle modification on diet physical activity, alcohol consumption smoking and weight management.
- ✓ Management of other reversible or modifiable risk factors.
- ✓ Assessment and management of complications.
- ✓ Arrangement of routine post-MI assessments by secondary care and Support.
- ✓ Awareness of a person's wider heart health and social care needs.

American Heart Association (AHA)

The American Heart Association (AHA) recommends cardiac rehabilitation to reduce the heart related problems and Related deaths

- ✓ Exercise training and counseling to maintain healthy heart.
- ✓ Education for healthy living. Education for managing risk factors.
- ✓ Counseling to reduce stress level. Such as cortisol and other related conditions.
- ✓ Nutrition counseling. Stress management.

The AHA suggests that cardiac rehabilitation programs can be last around 12 weeks based on individual needs.

American College of Cardiology (ACC)

The American College of Cardiology (ACC) mentions these points about cardiac rehabilitation:

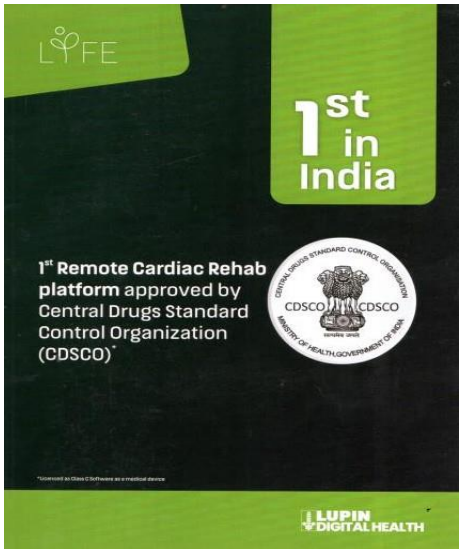
- ✓ Cardiac rehabilitation is a program for people who have had heart attacks heart failure, or other heart conditions requiring surgery or medical treatment.
- ✓ The program includes exercise and education on healthy lifestyle practices. It also involves medication adherence and stress management techniques.
- ✓ Cardiac rehabilitation can improve heart health. It can reduce symptoms and enhance mental well-being.
- ✓ The program is usually done in a hospital outpatient setting. However home-based cardiac rehabilitation may be an option for some patients.
- ✓ Cardiac rehabilitation is safe and can have a favorable cost-benefit ratio. It improves quality-adjusted life-years gained.
- ✓ Automatic referral systems may improve participation in the program. Home-based cardiac rehabilitation can also help.
- ✓ Cardiac rehabilitation may also have role in the period before planned procedures.

European College of Cardiology (ESC)

The European Society of Cardiology (ESC) guidelines for cardiac rehabilitation include:

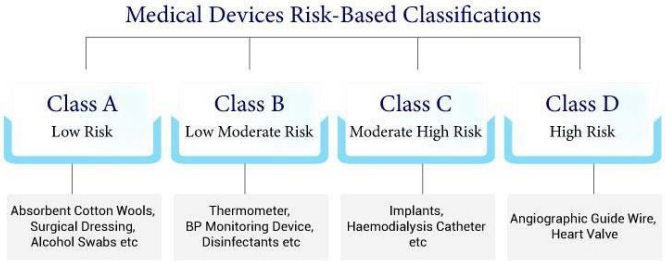
- ✓ Exercise stress tests. These tests helpful for maximal exercise capacity in patients suffering from with cardiovascular disease.
- ✓ Cardiac rehabilitation. Follow-up echocardiogram 2D and 3D after an acute coronary syndrome event.
- ✓ Exercise programs for individuals with Acute and chronic heart failure. These are initiated after medical therapy is optimized.
- ✓ Shared decision-making. This is for asymptomatic cardiac individuals with moderate valve disease.
- ✓ Risk stratification via exercise testing. This includes imaging for individuals with acropathies.
- ✓ Individualized approach for patients with hypertrophic cardiomyopathy.
- ✓ Management of arrhythmias and channelopathies during exercise.

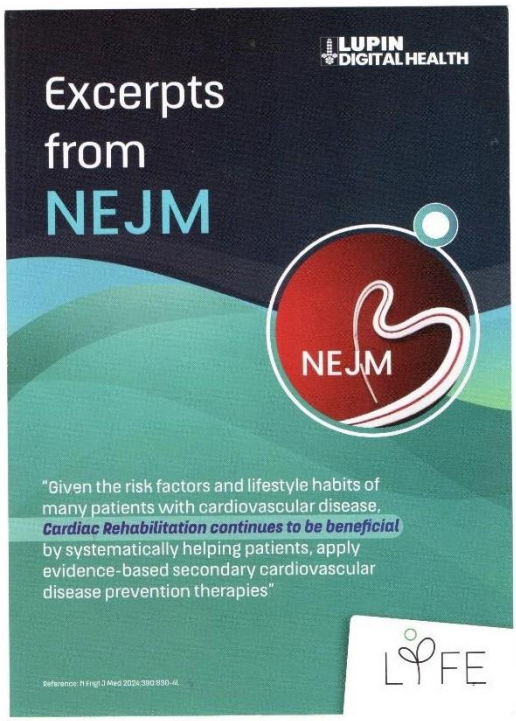
CDSCO (Central Drug Standard Control Organization)



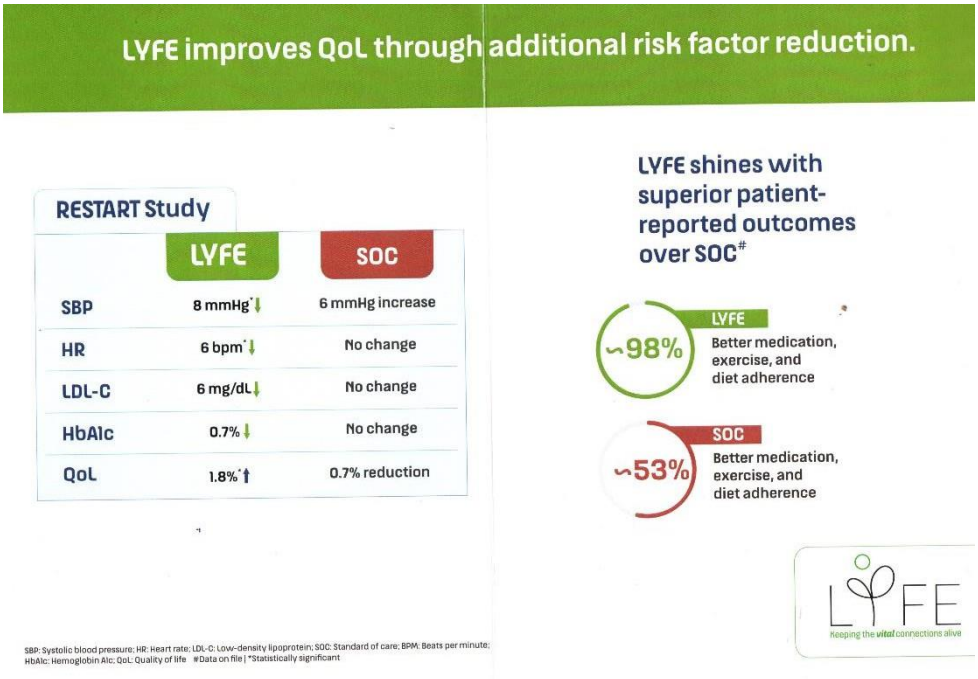
(Figure-02)

Lupin Digital Health, India's pioneer in evidence-based cardiology digital therapeutics, is excited to announce that its Lyfe platform has been approved as a Class C Software as Medical Device by the Central Drugs Standard Control Organization (CDSCO).





(Figure-03:- New England Journal of Medicine)



(Figure-04: - Restart Study LYFE)

Introduction

CVDs persist as the top reason for morbidity and fatality on a global scale, posing an enormous challenge to healthcare systems. Of these, CAD, HF, and ACS stand out in terms of prevalence thereby requiring all-inclusive coping strategies. However, even though some CARDIAC REHABILITATION (CR) programs have shown effectiveness in improving clinical outcomes among these population segments, issues like access and adherence are major problems. Thus, remote cardiac rehabilitation (RCR) has been recognized as a viable option because of advancements in digital health technology.

These structured rehabilitation protocols which are delivered through virtual channels form the basis of remote cardiac rehabilitation programs enabling patients perform recuperation at their homes. Besides easing access for all such patients, this method also allows continued monitoring as well personalized individual suffering from CAD, HF or ACS.

.

Research has shown that remote cardiac rehabilitation (RCR) reduces hospital readmission rates and lower the risk of heart attacks to track patient counselling.

An example of effective RCR is Lupin Digital Health's Lyfe platform. Adoption of lupin digital therapeutic to provide better outcome and clinical evidences can change the person and patient observation towards remote cardiac rehab program.

This dissertation will explore the impact of RCR on patients with CAD, HF, and ACS, evaluating its effectiveness for potential future address the cardiac heart recovery program to reduces the changes the belief the segmentations.

Literature Review

Introduction

- **Definition and Importance of Cardiac Rehabilitation (CR)**: Cardiac rehabilitation (CR) is a comprehensive program which is designed to improve the CVD health of individuals with heart disease to quality of life , increases heart function and provide better outcome of clinical outcome and also provided to change better health

- **Emergence of Remote Cardiac Rehabilitation**: Remote CR programs has gained prominence due to advancements in digital health technologies and the necessity for alternative care delivery models. These programs offer the potential to make CR more accessible, especially in rural and underserved areas.

Historical Background in India

- **Development of Cardiac Rehabilitation Programs in India**: Traditional CR programs in India have focus hospital-based and concentrated in urban areas. Despite the known benefits, participation rates have been low due to logistical and barriers, lack of awareness, and limited availability of structured programs.
- **Initial Attempts at Remote CR in India**: Early initiatives in remote technology-based CR in India include pilot programs and studies conducted by hospitals and research institutions. These have focused on utilizing mobile technology and teleconsultations to extend CR services beyond hospital settings.

Clinical Efficacy in India

- **Health Outcomes**: Studies comparing remote CR with traditional CR in India have shown. Has change and clinical outcome they are used presently significant Remote CR has also been associated with improved patient satisfaction and quality of life. It also provide better health outcome to better reach and readmission rate gone lower then the attachments of cardiac possibilities to reduce better

- **Patient Adherence and Engagement**: Research indicates that remote CR programs in India have variable adherence rates, influenced by factors such as the ease of use of technology, patient education, and continuous engagement strategies. Strategies like regular follow-ups, personalized feedback, and family involvement have been effective in improving adherence.

  • **Barriers and Facilitators**: Other hindrances are; low technology skill, variability in internet connection, and socio- economic challenges. Some of the enablers are; Having family support; Having content relevant to culturally; Using local languages in digital tools.

Cost-Effectiveness in India

- Altogether, if one has to compare the cost efficiency in the Indian context, then definitely remote CR can play a great role. As they cut travel expenses, number of hospital readmission, and enable easy scaling up it is economical.

- In this regard, remote CR has the possibility to decrease the load on the tertiary healthcare system. Hence, the study showed that by handling a large volume of CR in a community or home setting, this tends to contribute to proper use of healthcare resources and partially relieve those centers.

Implementation Challenges in India

Challenges also exist when one is attempting to put into operation remote CR in India.

- Technological Challenges: One of the key issues is the protection of data and compatibility of the devices. Also, there is a need to address the issue of the digital divide to ensure that all the population within any given nation, especially between the urban and rural areas, has equal and unhindered access to the internet.

- Regulatory and Ethical Considerations: The guidelines for effective telehealth include succession, standards in a patient's health record, and existing laws related to CR. They include matters to do with patient enlisting consent, patients' self-governance, and fairly proportioned distribution.

- Cultural and Societal Challenges: There are cultural factors that play a role including; people in the area may be used to meeting their doctors in person and would rather use traditional medicine than a remote CR. Of equal concern when planning and implementing remote CR services should be the population's social factors.

Let's take a look at some successful programs that have implemented remote CR:Let's take a look at some successful programs that have implemented remote CR:

Highlighting Successful Programs: Many leading hospitals of the metropolitan cities have already practiced efficient remote CR programs. These include teleconsultation and mobile

health applications in reaching out to the patients with CR services. Most of these programs work hand-in-hand with the local health workers to expand its coverage and success rates.

Lessons Learned: In developed and implementing patient transformation programs, some of the lessons are the need to educate patient, follow them up and the need to consider culture in planning and implementing the programs

Future Directions

Looking ahead, there are a few areas to focus on: Looking ahead, there are a few areas to focus on:

Research Gaps: As for the further research agenda there is a need to study the applicability of different technological solutions as well as how the idea of remote CR could be implemented in connection with the primary care infrastructure.

Innovative Models and Trends: The future trends are such as AI for patient-specific – treatment, Virtual reality for exercise therapy, and blockchain application for safe records management. That is, these creative methodologies can help to increase the efficiency of remote CR even more.

These challenges and the new trends that are being adopted have the capability of remarkably transforming healthcare delivery in India through remote cardiac rehabilitation..

Research Methodology

1. Research Design

1. 1 Goals: Find out how much more/rless effective it is to have cardiac rehab through remote means than through the usual means. Research Design: It will be useful to design and conduct a comparative trial, such as RCT to compare the results of implementing Traditional CR vs remote CR.

2. Participant Selection: Comprehensively stipulate the conditions upon which clients can attend; this may include heart attack survivors, post-surgery clients etc, and their health status.

2. 1 Randomization (if applicable): While performing an RCT study, one should randomly allocate eligible participants to remote or traditional rehab groups in order to minimize bias.

3 Interventions:

3. 1 Remote Cardiac Rehab Program: Describe the features of the remote program such as the exercise routines, diet recommendations, educational information, and ways of tracking clients' condition (for example, wearables, telemedicine).

3. 2 Traditional Cardiac Rehab Program: Explain the conventional face to face rehab program which is acted as benchmark or reference.

4. Data Collection Methods

4. 1 **Outcome Measures**: Define objectives, both short-term and long-term, for example change in your cardiovascular fitness in terms of VO2 max, changes in subjects' blood pressure, subject compliance rates, and level of satisfaction.

4. 2 **Data Collection Tools**: Explain how data will be obtained, through questionnaires, chart review, physical examination, telemonitoring devices, etc.

5. Implementation Plan

5. 1 TimeLine: We should come up with the following timeline of the recruitment period for the participants, period that the intervention will be conducted, and period that the follow-up assessment will be conducted.

5. 2 Quality Control: There was lack of mechanism that enables both intervention groups to be on high alert in order to ratify the study protocol and program fidelity.

6. Evaluation and Dissemination

6. 1 Evaluation: In evaluating the remote cardiac rehab program, it will be determined if the intervention is actually doable, efficient, and safe according to the results of the study.

6. 2 Dissemination: Once the results have been obtained, the findings will be disseminated to the relevant peer-reviewed journals together with presenting it to conferences and communicating the outcomes Of with the healthcare givers so as to effect their practice.
.

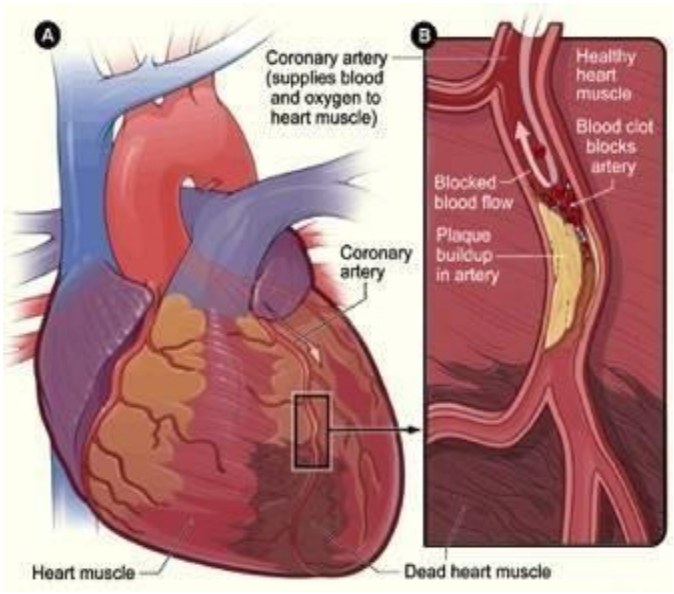
Differentiation of Remote Cardiac Rehabilitation Programs in ACS, CAD and HF Patients

Definition: Acute Coronary Syndrome (ACS) is a group of diseases that includes unstable angina and myocardial infarction or commonly called a heart attack due to insufficient blood supply to the affected area of the heart muscles.

Mechanism of Action (MOA):

• Phase 1: This assessment is conducted in the hospital soon after the event, and is based on patient scores on NIH and GCS.
o Monitoring and Stabilization: Pervasive monitoring is another technique in which an
o Vital assets, cardiogram and pulse, prescription (Anticoagulants, Etc).
o Education: Basic knowledge about ACS, lifestyle changes and about medications.
o Psychological Support: Therapeutic counseling to address any issues with stress and or anxiety.

• Phase 2: In the early recovery stage which is also referred to as transition to home, client knowledge is emphasized with an aim of enhancing the clients' outcomes.
o Exercise Prescription: exercise therapy, at first in liaison with an health related professional.
o Risk Factor Management: Education to do with diet on the kind of foods to take, not smoking and how to effectively manage high blood pressure.
o Telemonitoring: Assessment of physiological and chief complaints' status at a distance



(Figure 3- Acute Coronary Syndrome)

1. Chronic Artery Disease (CAD)

1. **Chronic Artery Disease (CAD)**

Definition: CAD is a condition characterized by the constriction or occlusion of the coronary arterial tree usually by atherosclerosis and resulting in the diminutive supply of blood to the muscular substance of the heart.

Mechanism of Action (MOA)

- Phase 1: These stages are assessment and stabilization.

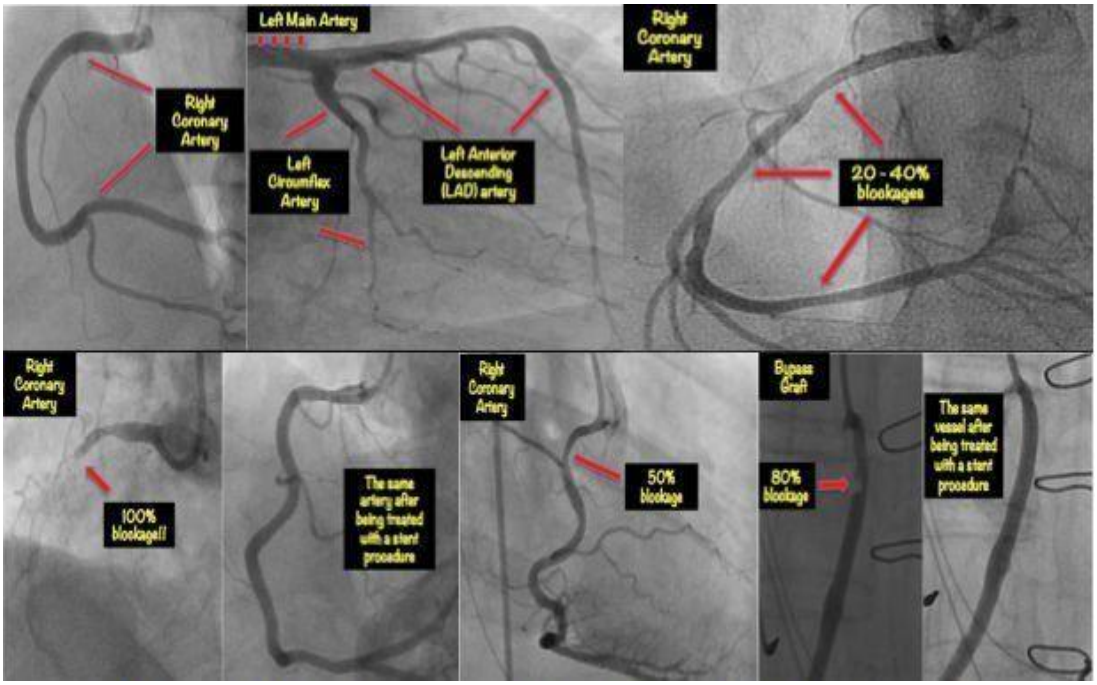
o Diagnostic Testing: Evaluating the severity and the spread of CAD (e.g. , angiography).

o Medication Initiation: Antiplatelet agents, statins and other symptomatic medications only.

o Education: CAD, changes in lifestyle, and compliance to the medications.

· **Phase 2**: Rehabilitation of a stroke patient begins on discharge from the hospital and covers the remainder part of the patient's life span.

o Exercise Program: Peculiar structured aerobic and resistance training that is based upon the patient's functional ability.
o Nutritional Counseling: Modifications of the diet in an effort to decrease cholesterol and pressure of blood.
o Behavioral Support: Stress reduction measures and processes of psychological consultation.



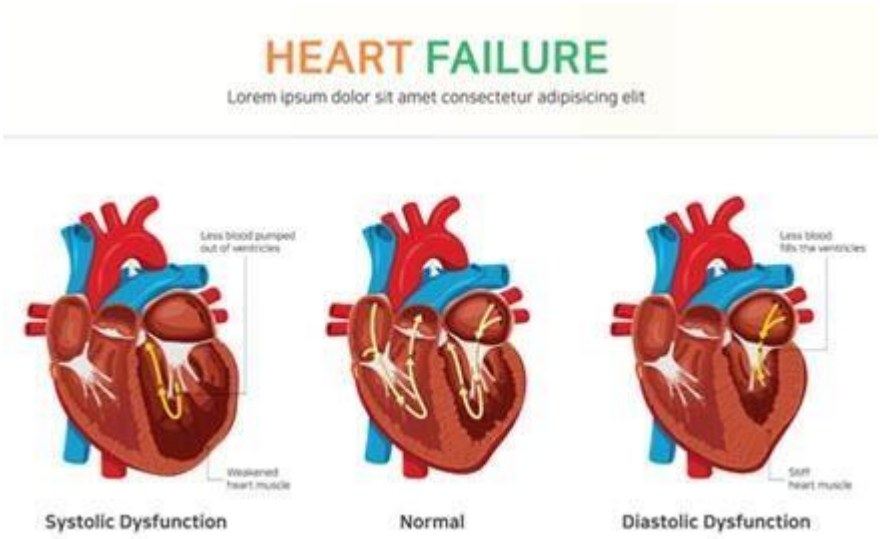
(Figure 4 Chronic Coronary Syndrome)

Heart Failure (HF)

Definition: Heart Failure, otherwise known as Congestive Heart Failure, is a long-term condition in which the heart's muscular walls are weak and are unable to pump blood effectively and thereby providing symptoms like tiredness, exertion during breathing, and additional fluid buildup in the body.

Mechanism of Action (MOA):

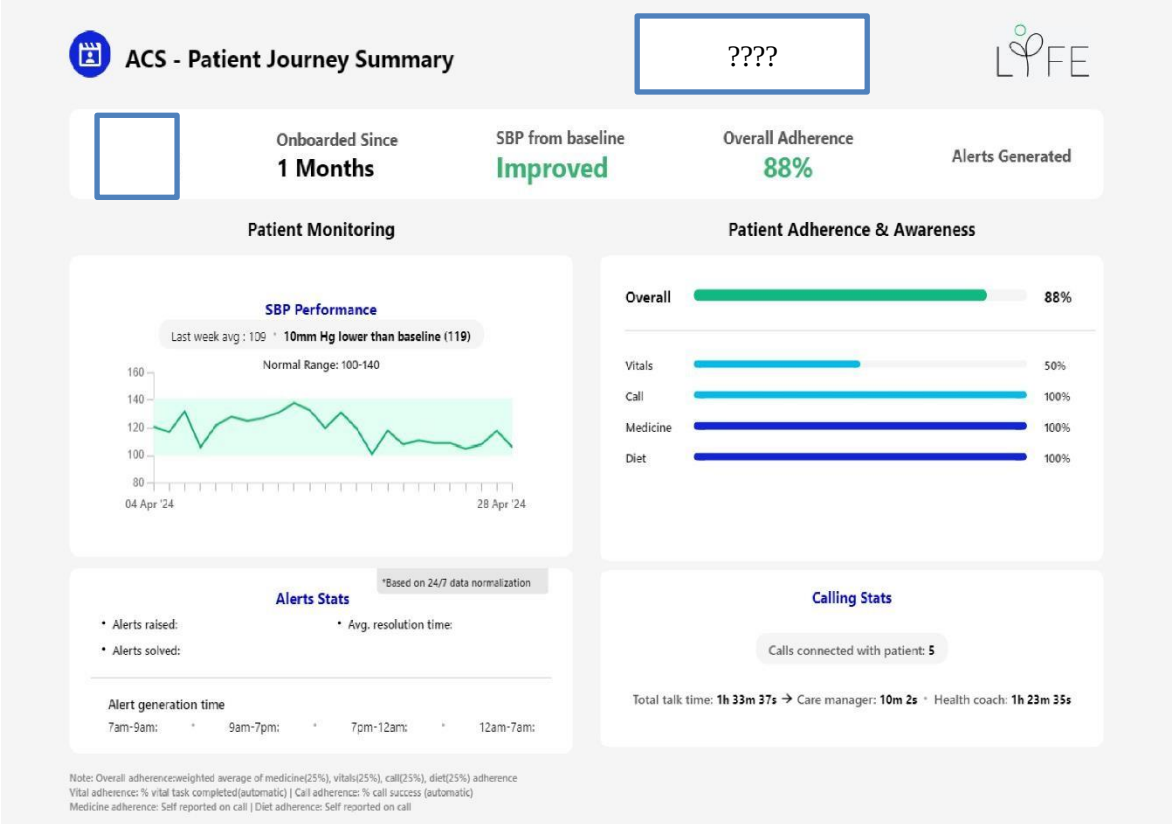
- **Phase 1: Acute Management**:
  - **Diagnosis:** Echocardiography and biomarker testing.
  - **Medicine:** Diuretics, ACE inhibitors, beta-blockers for symptom control.
  - **Education**: Understanding HF, fluid restriction, and medication adherence.
-
- **Phase 2: Rehabilitation and Chronic Disease Management**:
  - **Exercise Training**: Low-intensity aerobic exercises.
  - **Dietary Guidance**: Sodium restriction and fluid management.
  - **Monitoring**: Telehealth for symptom tracking and medication adjustments.



(Figure 3 Heart Failure)

CASE STUDY

A hypertensive diabetic patient on antihypertensive and antidiabetic medications experiences severe chest pain worse toward the left arm, slightly exerting himself through breathing heavily or sweating excessively and dizziness. Her blood pressure was 160/95 mmHg; there was ST-segment elevation in leads II, III, and a VF on an ECG, pointed to inferior wall myocardial infarction. An echocardiogram has been performed, showing left ventricular ejection fraction (LVEF) of 50%, indicating a moderate reduction in the heart's pumping ability (normal range: This means that the original NTM patients comprised of 55%-70% of the total COAM patients now diagnosed in the United States. There was also hypokinesis of the inferior wall of the left ventricle in the echocardiogram, corresponding to the affected segment. She focused on this programme after being enrolled in LYFE for a month, which consisted of remote cardiac rehabilitation.

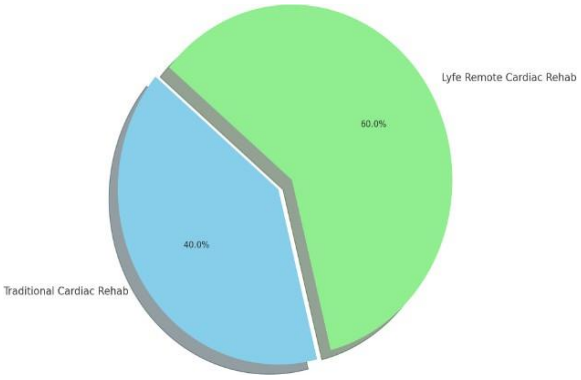


RESEARCH QUESTION

Research Question 1: How does remote cardiac rehabilitation compare to traditional in-person programs in improving cardiovascular outcomes for ACS patients?

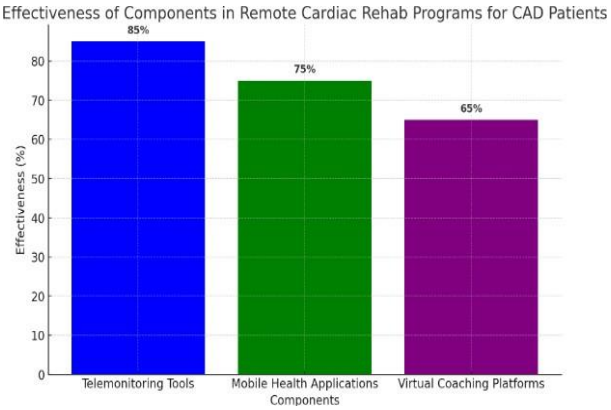
Answer: Remote cardiac rehabilitation programs for ACS patients have demonstrated comparable improvements in cardiovascular fitness, reduced hospitalizations, and better adherence to medication and lifestyle modifications when compared to traditional in-person programs.

LYFE vs Centre Cardiac Rehab



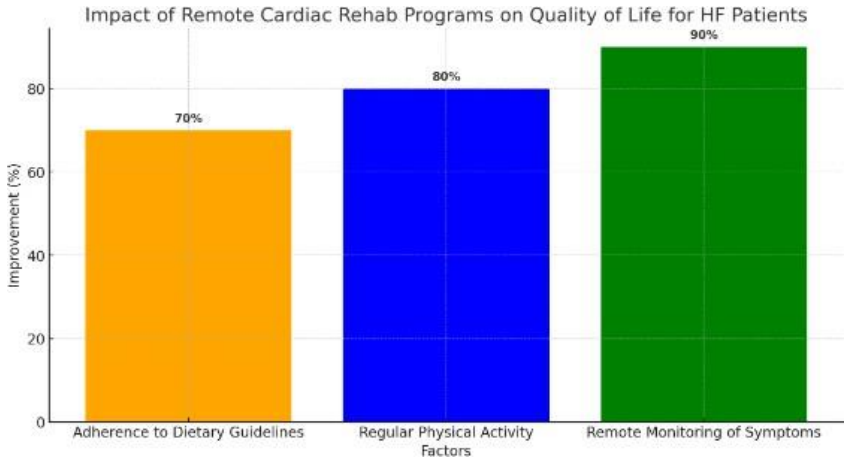
Research Question 2: What are the key technological components of effective remote cardiac rehabilitation programs for CAD patients?

Answer: Effective remote cardiac rehabilitation programs for CAD patients integrate telemonitoring tools, mobile health applications, and virtual coaching platforms to monitor physical activity, manage medications, and provide personalized health education remotely.



Research Question 3: How does remote cardiac rehabilitation impact quality of life and symptom management in HF patients?

Answer: Remote cardiac rehabilitation programs for HF patients contribute to improved quality of life by promoting adherence to dietary guidelines, facilitating regular physical activity, and offering remote monitoring of symptoms, leading to better symptom management and reduced hospital admissions.



Research Question 4: What are the barriers and facilitators which is necessary patient adherence in remote cardiac rehabilitation programs?

Answer: There is an various Barriers to adherence in remote cardiac rehabilitation programs include technological challenges, which implicit limited access to reliable internet, and patient reluctance to adopt new digital health tools. Facilitators include personalized support, culturally sensitive education materials in patient care

Research Question 5: How cost-effective are the remote cardiac rehabilitation programs as compare to traditional methods for managing chronic cardiac conditions?

Answer: Several studies have also indicated that tele-Rehab programs for cardiac patients are cost-effective as they cut on the overall medical expenses. They do this thru shortening the times admitted in the hospital and outdoor clinics. , these programs also have better long-term outcomes and patients' satisfaction compared to other traditional methods..

CONCLUSION

Demand for remote CR services hugely indicate that remote cardiac rehabilitation programs are something new in taking care of our hearts. Patients are followed up using telehealth technologies after being discharged from the hospital and the outcomes are rather remarkable. From this, have been able to show a positive impact in patients' results, meaning patients are able to access the help they require. They do this by assisting individuals to remain compliant with their medication regimens and educating them.

Remote cardiac rehab relates to such practices as supervision of patients, individual exercise prescriptions, and providing patients with all the information they need to be healthy. It is not only about addressing diseases such as, Acute Coronary Syndrome (ACS), coronary artery disease (CAD), and Heart Failure (HF). It is also about empowering patients with the equipment and, most importantly, the information through which they can assume control over their own cardiovascular health.

REFERENCE

1. N Engl J Med 2024; 390:830-41. *Enrollment within 15 days post discharge vs after 30 days.CR: Remote Cardiac Rehab

2. Murad H, et al. The Association Between Medication Non-Adherence and early and Late Read mision ates espatien with Acute Coronary Syndrome. Int J Gen Med. 202215.6791-5735

3. **Babu, A. S., et al. (2016**). "Effects of combined early and late phase cardiac rehabilitation on quality of life in South Asian patients with myocardial infarction." Heart Asia, 8(2), 36-41.

4. **Dinesen, B., et al. (2016).** "Noninvasive telemonitoring in patients with chronic heart failure: A systematic review and meta-analysis." Journal of Medical Internet Research, 18(1), e18.

5. Gonzalez, V. M., et al. (2017). "Impact of a home-based telehealth program on healthcare resource utilization after cardiac surgery." *Journal of Cardiopulmonary Rehabilitation and Prevention*, 37(4), 282-289.

6. Kitsiou, S., et al. (2015). "Effectiveness of mHealth interventions for patients with diabetes: An overview of systematic reviews." *PLoS One*, 10(3), e0119501.

7. Lawler, P. R., et al. (2011). "A systematic review of the effect of aerobic exercise training on left ventricular remodeling after myocardial infarction: Cardiac rehabilitation and recovery." *American Heart Journal*, 162(4), 699-710.e1.

8. Neubeck, L., et al. (2016). "Telehealth interventions for the secondary prevention of coronary

9. heart disease: A systematic review." *European Journal of Cardiovascular Prevention & Rehabilitation*, 16(3), 281-289.

10. Rawstorn, J. C., et al. (2016). "Telehealth exercise-based cardiac rehabilitation: A systematic review and meta-analysis." *Heart*, 102(15), 1183-1192.

11. Reed, S. D., et al. (2017). "Economic evaluation of home-based cardiac rehabilitation compared with center-based cardiac rehabilitation and usual care." *American Heart Journal*, 194, 105-114.

12. Sullivan, J. L., et al. (2019). "The efficacy of home-based cardiac rehabilitation on exercise capacity and quality of life: A meta-analysis." *Journal of Cardiopulmonary Rehabilitation and Prevention*, 39(1), 15-25.

13. Yeh, R. W., et al. (2019). "Remote monitoring programs for the management of cardiovascular diseases: A systematic review." *Journal of the American College of Cardiology*, 74(6), 777-787.