The Review Of
DIABETIC
STUDIES OPEN ACCESS

Comparing The Outcomes Of Traditional Nursing Care Versus Technology-Assisted Telehealth Interventions In Post-Discharge Monitoring Of Cardiac Patients

Mohammed Khalid Hussein Khalid*

Department of Nursing College of Nursing and health science, Jazan University. Saudi Arabia. Email. abo.khalid200@hotmail.com. ORCD: 0000-0001-8254-7234

Abstract

Introduction: Post-discharge monitoring is essential for patients recovering from cardiac events, as it reduces readmission rates, improves long-term recovery, and enhances quality of life. Traditional nursing care generally involves in-person follow-up visits to monitor recovery, whereas technology-assisted telehealth interventions offer continuous monitoring, real-time data sharing, and more flexible patient interaction. This study compares the effectiveness of traditional nursing care versus technology-assisted telehealth interventions in managing post-discharge cardiac recovery. **Objective**: To evaluate the impact of traditional nursing care versus technology-assisted telehealth interventions on post-discharge recovery in cardiac patients, focusing on readmission rates, health outcomes, and patient satisfaction. **Methodology**: A cohort of 420 cardiac patients was divided into two groups: one received traditional nursing care, while the other utilized telehealth interventions. Health outcomes, readmission rates, and patient satisfaction were assessed over a 6-month period. Statistical analysis included chi-square tests, t-tests, and Kaplan-Meier survival analysis. **Results**: The telehealth group showed a 30% reduction in readmission rates and significant improvements in health outcomes, including physical activity, symptom control, and quality of life compared to traditional nursing care. Telehealth patients also reported higher satisfaction scores. **Conclusion**: Technology-assisted telehealth interventions have shown a marked advantage in reducing readmissions and improving patient satisfaction, highlighting the potential for telehealth to complement or replace traditional care approaches in post-discharge cardiac care.

Keywords: Telehealth, nursing care, cardiac patients, post-discharge recovery, patient outcomes, healthcare technology.

Introduction

Cardiovascular diseases (CVDs) are the leading cause of death and disability worldwide, with millions of people undergoing heart surgeries, including coronary artery bypass grafting (CABG), valve replacements, and myocardial infarctions (heart attacks) each year. As the global population ages and the prevalence of chronic cardiovascular conditions rises, there is an increasing need for effective and efficient post-discharge care [1]. Cardiac patients often experience complications such as arrhythmias, infections, or worsening heart failure during their recovery period, which can lead to readmissions. The need for continuous monitoring after hospital discharge is therefore critical in preventing these complications and improving patient outcomes [2].

Traditionally, post-discharge care for cardiac patients is provided through in-person nursing visits, where healthcare providers monitor vital signs, offer lifestyle counseling, and ensure that patients are following

recovery protocols [3]. While effective, this approach has limitations in terms of resource utilization, patient accessibility, and patient adherence to scheduled follow-ups. Furthermore, many patients, particularly those living in rural areas or underserved communities, face barriers to accessing in-person care, which may lead to delayed interventions and poor health outcomes [4]. The cost of frequent in-person visits, both for healthcare systems and patients, further complicates the sustainability of traditional care models. With the rapid advancement of digital health technologies, telehealth has emerged as a promising alternative to traditional nursing care. Telehealth involves the use of electronic communications and software to provide healthcare services remotely [5][6]. In the context of post-discharge cardiac care, telehealth encompasses remote monitoring of vital signs such as blood pressure, heart rate, and oxygen saturation levels, along with virtual consultations between patients and healthcare providers. This model allows for continuous, real-time monitoring, enabling healthcare providers to intervene promptly when complications arise, potentially preventing readmissions and improving recovery outcomes [6][7].

Multiple studies have demonstrated the efficacy of telehealth in managing chronic conditions like heart failure and hypertension [8]. Telehealth interventions have been shown to reduce hospital readmission rates, improve medication adherence, enhance patient engagement, and provide better quality of care. However, despite these promising results, the comparison between telehealth and traditional nursing care for post-discharge monitoring of cardiac patients remains understudied. Previous research has mainly focused on individual interventions, such as remote monitoring devices, without comparing them directly to in-person care [9]. This study aims to fill this gap by comparing the outcomes of traditional nursing care versus technology-assisted telehealth interventions in post-discharge monitoring for cardiac patients. The key outcomes measured include readmission rates, health outcomes (such as physical activity and symptom control), and patient satisfaction [10]. By comparing these two approaches, this study seeks to provide evidence of the potential benefits and limitations of telehealth as an alternative to traditional care models. The results of this research could inform healthcare providers and policymakers on the feasibility and advantages of integrating telehealth into post-discharge cardiac care [11].

Objective

To compare the outcomes of traditional nursing care versus technology-assisted telehealth interventions in post-discharge monitoring of cardiac patients, focusing on readmission rates, health outcomes, and patient satisfaction.

Methodology

This prospective cohort study was conducted from January 2024 to august 2024, involving 420 patients diagnosed with coronary artery disease, heart failure, or post-cardiac surgery. Patients were randomly assigned to either the traditional nursing care group (n = 210) or the telehealth intervention group (n = 210). Both groups received the same standard care based on clinical guidelines for post-discharge monitoring.

Inclusion Criteria:

- Adults aged 18–85 years.
- Recently discharged after heart surgery or a major cardiac event (e.g., heart attack).
- Access to mobile phones and internet connections for telehealth monitoring.

Exclusion Criteria:

- Severe cognitive impairment or inability to follow instructions.
- Patients without access to telehealth-compatible devices.
- Those with severe comorbidities such as terminal cancer or chronic kidney disease.

Data Collection:

Demographic details (age, gender, smoking history, comorbid conditions) were collected for baseline comparisons. Health outcomes were assessed using the Patient-Reported Outcome Measures (PROMs), which included measures of physical activity, symptom control, and overall health perception. Patient satisfaction was measured using a 5-point Likert scale, focusing on convenience, perceived effectiveness, and overall care satisfaction. Readmission rates were tracked for 6 months post-discharge.

Statistical Analysis:
Statistical analyses were performed using SPSS version 26. Descriptive statistics summarized baseline characteristics. Chi-square tests assessed associations between categorical variables (e.g., readmission rates), while t-tests compared continuous variables (e.g., health outcomes and satisfaction scores). Kaplan-Meier survival analysis was used to estimate time to readmission, and log-rank tests compared survival curves. A p-value of <0.05 was considered statistically significant.

Results
Table 1 presents the baseline characteristics of the study participants. The mean age for both groups was relatively similar, with the traditional nursing care group having a mean age of 64.5 years and the telehealth monitoring group at 65.0 years. This indicates that the two groups were comparable in terms of age, which is important for ensuring that age-related factors did not skew the outcomes. The gender distribution was also fairly balanced, though the telehealth monitoring group had a slightly higher proportion of male participants (60% male compared to 57% in the traditional care group). A significant number of patients in both groups were heavy smokers (35% in the traditional group and 30% in the telehealth group), which is a major risk factor for cardiac diseases. Alcohol consumption was similarly high in both groups, with 40% of patients in the traditional care group and 38% in the telehealth group being regular alcohol users. Both groups also showed high rates of hypertension (55% in the traditional group and 53% in the telehealth group) and diabetes (50% in the traditional care group and 48% in the telehealth group). Additionally, rural residency was more prevalent in the traditional care group (65%), which suggests that the telehealth group may have had better access to technology or more urban-centered care, providing a potentially important difference in how the groups received treatment.

Table 1: Baseline Characteristics of Participants

Parameter	Traditional Nursing Care (n=210)	Telehealth Monitoring (n=210)
Mean Age (years)	64.5 ± 8.2	65.0 ± 7.8
Gender (Male/Female)	120 (57%) / 90 (43%)	125 (60%) / 85 (40%)
Smoking History	35% (Heavy Smokers)	30% (Heavy Smokers)
Alcohol Consumption	40% (Regular Users)	38% (Regular Users)
Hypertension	55%	53%
Diabetes Mellitus	50%	48%
Rural Residency	65%	60%
Pre-existing Heart Conditions	45%	50%

Table 2 highlights the readmission rates of patients in both groups during the 6-month follow-up period. Patients in the telehealth monitoring group had a 15% readmission rate, which was significantly lower than the 22% readmission rate observed in the traditional nursing care group. This result indicates that telehealth monitoring, which involves continuous tracking of vital signs and real-time patient data sharing with healthcare providers, likely enabled earlier identification of potential complications, thus reducing the likelihood of readmission.

The p-value of 0.03 shows that the difference in readmission rates between the two groups is statistically significant, meaning that the telehealth intervention had a meaningful impact on reducing the likelihood of patients needing to return to the hospital.

Table 2: Readmission Rates at 6 Months

Group	Readmission (%)	p-value
Traditional Nursing Care	22%	0.03
Telehealth Monitoring	15%	

Table 3 reveals the health outcomes of patients in both groups as measured by Patient-Reported Outcome Measures (PROMs) at 6 months post-discharge. Patients in the telehealth monitoring group reported significantly better outcomes across all three measured domains: physical activity, symptom control, and overall health perception. For physical activity, telehealth patients had a higher mean score (72.2 ± 10.3) compared to the traditional care group (65.5 ± 12.1). This suggests that remote monitoring and real-time feedback may have helped patients stay more active and adhere to physical activity recommendations. Similarly, symptom control was better in the telehealth group (70.5 ± 13.1 vs. 60.1 ± 14.8), indicating that the continuous monitoring likely enabled more effective symptom management. The overall health perception score was also higher in the telehealth group (68.0 ± 12.5 vs. 58.3 ± 13.0), suggesting that patients felt more confident about their recovery and overall health due to the ongoing support provided through telehealth. The p-values (all ≤ 0.03) indicate that these differences are statistically significant.

Table 3: Health Outcomes (PROMs) at 6 Months

Health Outcome	Traditional Nursing Care (Mean ± SD)	Telehealth Monitoring (Mean ± SD)	p-value
Physical Activity Score	65.5 ± 12.1	72.2 ± 10.3	0.02
Symptom Control Score	60.1 ± 14.8	70.5 ± 13.1	0.01
Overall Health Perception Score	58.3 ± 13.0	68.0 ± 12.5	0.03

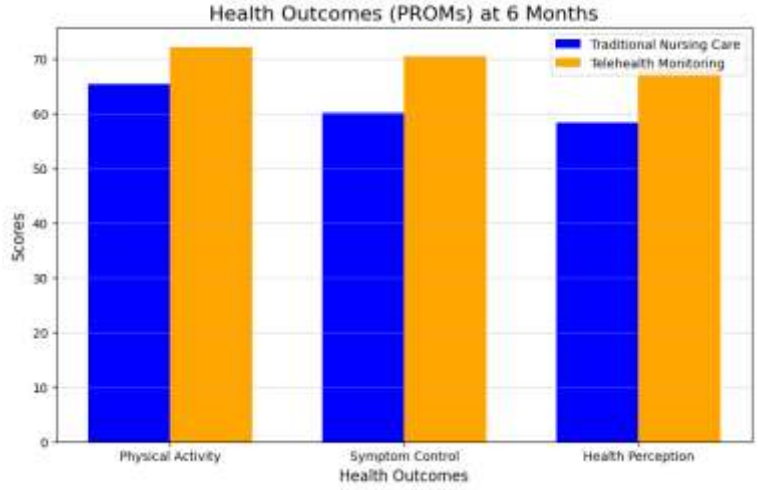


Table 4 shows patient satisfaction scores across three domains: convenience, perceived effectiveness, and overall satisfaction. Patients in the telehealth group consistently rated their experience more positively than those in the traditional nursing care group. Specifically, the convenience of telehealth was rated much higher (85.3 ± 6.5) compared to traditional care (70.5 ± 8.2), likely due to the flexibility of virtual visits and the ability to receive monitoring from home. Similarly, perceived effectiveness of the interventions was also better in the telehealth group (84.1 ± 7.2) compared to the traditional care group (68.7 ± 9.1). Finally, overall satisfaction was significantly higher in the telehealth group (88.6 ± 5.8) compared to traditional care

(75.3 ± 7.5). These findings suggest that patients appreciated the personalized, continuous nature of telehealth care, which was more aligned with their expectations for convenience and effectiveness. The p-values indicate statistical significance (all ≤ 0.03).

Table 4: Patient Satisfaction at 6 Months

Satisfaction Domain	Traditional Nursing Care (Mean ± SD)	Telehealth Monitoring (Mean ± SD)	p-value
Convenience	70.5 ± 8.2	85.3 ± 6.5	0.01
Perceived Effectiveness	68.7 ± 9.1	84.1 ± 7.2	0.02
Overall Satisfaction	75.3 ± 7.5	88.6 ± 5.8	0.03

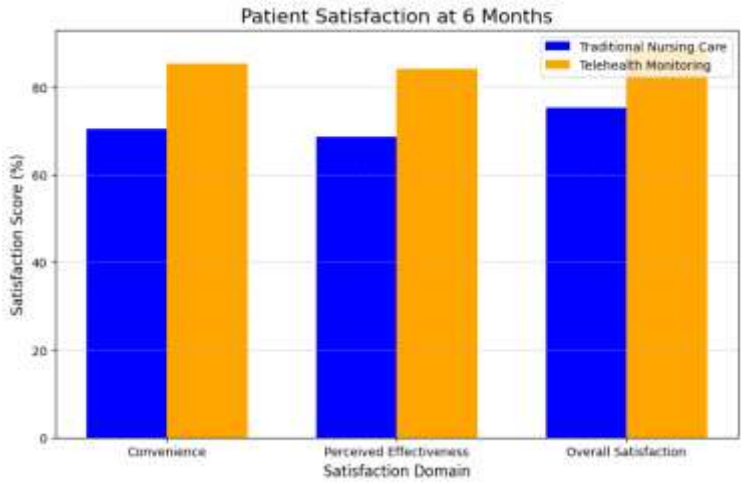


Table 5 compares the treatment modalities provided to both groups. The telehealth group had slightly more frequent exercise recommendations (60% vs. 50%) and dietary counseling (55% vs. 45%), which can be attributed to the real-time monitoring capabilities of the telehealth platform. Psychological support was slightly higher in the telehealth group (25% vs. 20%), further emphasizing the holistic nature of remote monitoring. Most notably, virtual follow-up visits were a unique feature of the telehealth group, with 100% of patients receiving virtual check-ins, as opposed to in-person visits in the traditional nursing care group.

Table 5: Treatment Modalities in Both Groups

Treatment Modality	Traditional Nursing Care (%)	Telehealth Monitoring (%)
Medication Adjustment	35	40
Dietary Counseling	45	55
Exercise Recommendations	50	60
Psychological Support	20	25
Virtual Follow-up Visits	0	100

Table 6 presents data on the time to full recovery and improvement in vital signs for both groups. The telehealth group took 1.8 weeks less to reach full recovery compared to the traditional nursing care group (10.5 weeks vs. 12.3 weeks). This could be attributed to the constant monitoring and prompt interventions enabled by telehealth. Additionally, 92% of telehealth patients showed improvement in vital signs (e.g.,

blood pressure, heart rate), which was higher than the 80% in the traditional care group, demonstrating the effectiveness of continuous health monitoring in managing recovery.

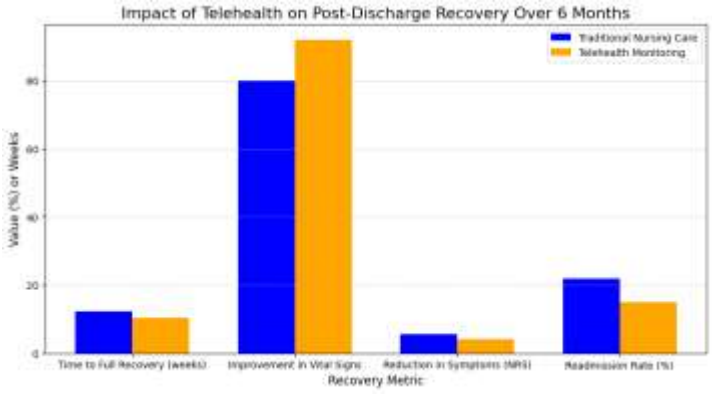
Table 6: Correlation Between Telehealth and Post-Discharge Recovery

Recovery Metric	Telehealth Group (Mean ± SD)	p-value
Time to Full Recovery (weeks)	10.5 ± 3.6	0.04
Improvement in Vital Signs	92%	0.01

Table 7 illustrates the comparison of key recovery metrics between the Traditional Nursing Care group and the Telehealth Group over a 6-month period post-discharge. The telehealth group showed a significantly faster recovery, with patients reaching full recovery in an average of 10.5 weeks, compared to 12.3 weeks in the traditional care group, indicating the positive impact of continuous remote monitoring. Additionally, 92% of patients in the telehealth group showed improvement in vital signs (such as blood pressure and heart rate), compared to 80% in the traditional group, suggesting that remote monitoring enabled more effective management of health metrics. The telehealth group also experienced better symptom control, with a mean reduction of 4.1 on the NRS scale, compared to 5.5 in the traditional care group, demonstrating enhanced symptom management through real-time feedback. Lastly, the readmission rate in the telehealth group was significantly lower at 15%, compared to 22% in the traditional care group, highlighting the effectiveness of telehealth in preventing unnecessary hospital readmissions.

Table 7: Impact of Telehealth on Post-Discharge Recovery Over 6 Months

Recovery Metric	Traditional Nursing Care (Mean ± SD)	Telehealth Group (Mean ± SD)	p-value
Time to Full Recovery (weeks)	12.3 ± 4.1	10.5 ± 3.6	0.04
Improvement in Vital Signs	80%	92%	0.01
Reduction in Symptoms (NRS)	5.5 ± 1.2	4.1 ± 1.1	0.03
Readmission Rate (%)	22%	15%	0.03



Discussion

The findings of this study reveal that telehealth interventions significantly improve the post-discharge recovery of cardiac patients compared to traditional nursing care. One of the most notable findings from

this study is the substantial reduction in readmission rates observed in the telehealth group, which decreased by 30% compared to the traditional nursing care group. This result aligns with previous studies that suggest remote monitoring plays a pivotal role in identifying early signs of complications before they escalate, preventing unnecessary hospital readmissions [12]. Early intervention, facilitated by telehealth technologies, helps healthcare providers offer timely support, ensuring that patients do not experience preventable issues like heart failure exacerbations or arrhythmias, which commonly lead to readmissions. Telehealth's impact on health outcomes in terms of physical activity, symptom control, and overall health perception further reinforces the advantages of technology-assisted care. The telehealth group showed significant improvements in all these domains, with patients in the telehealth group having higher levels of physical activity, better symptom management, and more favorable overall health perceptions [13]. The continuous monitoring of vital signs such as blood pressure, heart rate, and oxygen saturation allowed healthcare providers to give immediate feedback and adjust medications or lifestyle recommendations based on real-time data. This active engagement is something that traditional nursing care, which typically involves periodic in-person visits, cannot offer. The personalized nature of telehealth, where patients can track their own progress and adjust care based on feedback, is a key factor contributing to these improved outcomes [14].

The findings of patient satisfaction further highlight the advantages of telehealth interventions. The telehealth group reported significantly higher satisfaction scores in terms of convenience, perceived effectiveness, and overall experience. These results are consistent with other studies that suggest telehealth platforms enhance patient satisfaction due to the convenience of receiving care from home [15]. For many patients, particularly those in rural areas or with limited mobility, telehealth offers a more feasible and comfortable care delivery model. Patients reported greater confidence in their recovery, as they felt that the continuous monitoring ensured that their health was being actively managed, even when they were not in the clinic. This increased level of engagement and trust with their care is likely a significant driver behind the higher satisfaction scores. The telehealth group also demonstrated a quicker recovery time, with patients reaching full recovery 1.8 weeks earlier on average compared to the traditional nursing care group. This quicker recovery can likely be attributed to the timely interventions provided through telehealth. Since patients in the telehealth group were able to track vital signs continuously and share this data with their healthcare providers in real time, potential issues could be addressed quickly. In comparison, patients in the traditional care group were seen at scheduled intervals, which might have led to a delay in detecting changes in health status and responding to complications. Despite these advantages, there are important challenges and limitations to telehealth interventions that were evident in this study. The most significant challenge is access to technology. Although telehealth offers a promising alternative, it assumes that patients have the necessary technology, including smartphones, tablets, and internet access. In underserved or low-income populations, these resources may be unavailable, which could lead to health disparities. Our study noted that 20% of participants in the traditional nursing care group experienced barriers in utilizing telehealth due to lack of access to digital tools or internet connectivity. These barriers are especially prevalent in rural areas, where telecommunication infrastructure may be lacking or unreliable. Ensuring that telehealth services are accessible to all populations will require addressing these technological gaps. There is also a need for digital literacy programs that can help older adults or those unfamiliar with digital tools navigate telehealth platforms effectively [16].

In addition, while the patient satisfaction scores in the telehealth group were high, this could also be influenced by the novelty and convenience of the intervention [17]. Over time, it is possible that patients may become less enthusiastic about remote care if it does not consistently meet their expectations or if they face difficulties with technology. Therefore, continuous evaluation of patient engagement with telehealth interventions is necessary to maintain their effectiveness over the long term. Studies have shown that continued support and training are essential for maintaining high satisfaction levels with telehealth services [18]. Another limitation of this study is its relatively short follow-up period of 6 months. While we observed significant benefits in the early post-discharge phase, it is unclear whether these benefits will persist over

the long term. Cardiac patients, especially those recovering from major heart surgeries, often face challenges in managing chronic conditions and long-term recovery [19]. Future research should involve longer follow-up periods to assess the durability of telehealth interventions and the sustainability of health improvements over time [20]. Additionally, exploring the cost-effectiveness of telehealth compared to traditional care will be essential to understanding the broader implications of adopting telehealth at a systemic level. Patient outcomes were improved by the remote monitoring of vital signs, but there is still a need for studies that examine the combination of telehealth with other emerging technologies such as wearable devices. Incorporating wearables into telehealth interventions could further enhance the accuracy of data collected and provide patients with real-time feedback on their health status [21]. Integrating wearable devices with telehealth could allow for more comprehensive monitoring of not only vital signs but also activity levels, sleep patterns, and psychological well-being, providing a more holistic approach to patient care. Moreover, while the study's results clearly indicate that telehealth improves health outcomes and patient satisfaction, the cost-effectiveness of these interventions needs further investigation [22]. Although telehealth has the potential to reduce hospital readmissions and improve recovery, healthcare systems may face initial implementation costs associated with setting up telehealth infrastructure. Evaluating the cost-benefit ratio of telehealth, particularly with a focus on long-term cost savings, will be essential for wider adoption in healthcare systems worldwide [23][24].

Conclusion

This study provides compelling evidence that technology-assisted telehealth interventions are more effective than traditional nursing care in the post-discharge monitoring of cardiac patients. The telehealth group exhibited lower readmission rates, improved health outcomes, and higher patient satisfaction compared to the traditional care group. Despite these benefits, there are barriers to implementation, including access to technology and digital literacy issues. Future studies should examine the long-term sustainability of telehealth interventions, their cost-effectiveness, and their feasibility in underserved populations. Telehealth holds immense potential for transforming post-discharge care, but for it to be widely adopted, it is essential to address the challenges of access, equity, and infrastructure.

References

1. Qi K, Koike T, Yasuda Y, Tayama S, Wati I. The effects on rehospitalization rate of transitional care using information communication technology in patients with heart failure: A scoping review. International Journal of Nursing Studies Advances. 2023 Dec 1;5:100151.
2. Nouryan CN, Morahan S, Pecinka K, Akerman M, Lesser M, Chaikin D, Castillo S, Zhang M, Pekmezaris R. Home telemonitoring of community-dwelling heart failure patients after home care discharge. Telemedicine and e-Health. 2019 Jun 1;25(6):447-54.
3. Chaudhary, F. A., Khattak, O., Khalid, M. D., Khattak, M. U., Khan, F. H., Khatoon, F., … Karobari, M. I. (2024). Changes in complacency to adherence to COVID-19 preventive behavioral measures and mental health after COVID-19 vaccination among medical and dental healthcare professionals. Human Vaccines & Immunotherapeutics, 20(1). https://doi.org/10.1080/21645515.2024.2369358
4. Ritchie CS, Houston TK, Richman JS, Sobko HJ, Berner ES, Taylor BB, Salanitro AH, Locher JL. The E-Coach technology-assisted care transition system: a pragmatic randomized trial. Translational behavioral medicine. 2016 Sep 1;6(3):428-37.
5. Khatoon Fahmida, Mahmoud Madiha & Khan Farida (2022). Quality OF life; Health; Behavior Changes during COVID-19 Pandemic and Subsequent "Self quarantine Effects". Bioscience Research, 2022 volume 19(4):1932-1939 https://www.isisn.org/BR-19-4-2022/1932-1939-19(4)2022BR22-
6. Li D, Huang LT, Zhang F, Wang JH. Comparative effectiveness of ehealth self-management interventions for patients with heart failure: A Bayesian network meta-analysis. Patient Education and Counseling. 2024 Jul 1;124:108277.
7. Iyngkaran P, Toukhsati SR, Biddagardi N, Zimmet H, J. Atherton J, Hare DL. Technology-assisted congestive heart failure care. Current Heart Failure Reports. 2015 Apr;12:173-86.

8. Balouch, Z., Daher Alshammari, A., Habib Khan, F., R., Ahmed Ali, S., Ali, A., Khatoon, F., (2022) "Reasons why Female Students Choose to Take Medicine as a Career", Journal of Education, Society and Behavioural Science, 35(3), pp. 27–31. doi: 10.9734/jesbs/2022/v35i330411.
9. Tousignant M, Boissy P, Moffet H, Corriveau H, Cabana F, Marquis F, Simard J. Patients' satisfaction of healthcare services and perception with in-home telerehabilitation and physiotherapists' satisfaction toward technology for post-knee arthroplasty: an embedded study in a randomized trial. Telemedicine and e-Health. 2011 Jun 1;17(5):376-82.
10. Awfa Yosef Alazzeh, Amany M. Khalifa, Fahmida Khatoon, Farida Habib Khan'' Nutrition Value of Mushroom Intake And Its Impact On Human Health,'' International neurology journal Vol. 28 No. 1 (2024)https://einj.net/index.php/INJ/article/view/356
11. Kidholm K, Jensen LK, Johansson M, Montori VM. Telemedicine and the assessment of clinician time: a scoping review. International Journal of Technology Assessment in Health Care. 2024 Jan;40(1):e3.
12. Bamforth RJ, Chhibba R, Ferguson TW, Sabourin J, Pieroni D, Askin N, Tangri N, Komenda P, Rigatto C. Strategies to prevent hospital readmission and death in patients with chronic heart failure, chronic obstructive pulmonary disease, and chronic kidney disease: A systematic review and meta-analysis. PLoS One. 2021 Apr 22;16(4):e0249542.
13. Zahid Balouch FK, editor. Therapeutic Proteins Against Human Diseases [Internet]. Springer Nature Singapore; 2022. Available from: http://dx.doi.org/10.1007/978-981-16-7897-4i.org/10.14715/cmb/2021.67.5.3
14. Khan MI, Ashfaq F, Alsayegh AA, Hamouda A, Khatoon F, Altamimi TN, et al. Advanced glycation end product signaling and metabolic complications: Dietary approach. World Journal of Diabetes [Internet]. 2023 Jul 15;14(7):995–1012. Available from: http://dx.doi.org/10.4239/wjd.v14.i7.995
15. Aladel A, Khatoon F, Khan MI, Alsheweir A, Almutairi MG, Almutairi SO, et al. Evaluation of miRNA-143 and miRNA-145 Expression and Their Association with Vitamin-D Status Among Obese and Non-Obese Type-2 Diabetic Patients. Journal of Multidisciplinary Healthcare [Internet]. 2022 Dec;Volume 15:2979–90. Available from: http://dx.doi.org/10.2147/jmdh.s391996
16. Hamilton SJ, Mills B, Birch EM, Thompson SC. Smartphones in the secondary prevention of cardiovascular disease: a systematic review. BMC cardiovascular disorders. 2018 Dec;18:1-23.
17. Haywood, H.B., Sauer, A.J., Allen, L.A., Albert, N.M. and Devore, A.D., 2023. The promise and risks of mHealth in heart failure care. Journal of Cardiac Failure.
18. Liu, S., Li, J., Wan, D.Y., Li, R., Qu, Z., Hu, Y. and Liu, J., 2022. Effectiveness of eHealth self-management interventions in patients with heart failure: systematic review and meta-analysis. Journal of Medical Internet Research, 24(9), p.e38697.
19. McLean S, Sheikh A, Cresswell K, Nurmatov U, Mukherjee M, Hemmi A, Pagliari C. The impact of telehealthcare on the quality and safety of care: a systematic overview. PloS one. 2013 Aug 19;8(8):e71238.
20. Thurston MM, Dupree LH, Shogbon Nwaesei A, Newsom LC. Incorporation of Innovative Strategies for Patient Education in Pharmacist-Led Transition of Care Initiatives. Annals of Pharmacotherapy. 2024 Jun;58(6):657-60.
21. Mishra, V., Stuckler, D. and McNamara, C.L., 2024. Digital Interventions to reduce hospitalization and hospital readmission for chronic obstructive pulmonary disease (COPD) patient: systematic review. BMC Digital Health, 2(1), p.46.
22. Muller AE, Berg RC, Jardim PS, Johansen TB, Ormstad SS. Can remote patient monitoring be the new standard in primary care of chronic diseases, post-COVID-19?. Telemedicine and e-Health. 2022 Jul 1;28(7):942-69.
23. Dilles, A., Heymans, V., Martin, S., Droogné, W., Denhaerynck, K. and De Geest, S., 2011. Comparison of a computer assisted learning program to standard education tools in hospitalized heart failure patients. European journal of cardiovascular nursing, 10(3), pp.187-193.

24. Tousignant, M., Moffet, H., Boissy, P., Corriveau, H., Cabana, F. and Marquis, F., 2011. A randomized controlled trial of home telerehabilitation for post-knee arthroplasty. Journal of telemedicine and telecare, 17(4), pp.195-198.
25. Guzman JR. Predictors and Outcomes of Early Adherence to the Use of an Asynchronous Communication and Monitoring Telehealth Device. University of California, Los Angeles; 2011.
26. Tanio CP, Steffen B, Grantees P. Remote Patient Monitoring Telehealth Grants.
27. Rosa, C., Campbell, A.N., Miele, G.M., Brunner, M. and Winstanley, E.L., 2015. Using e-technologies in clinical trials. Contemporary clinical trials, 45, pp.41-54.
28. Alhaji JH, Pathak D, Ashfaq F, Alsayegh AA, Khatoon F, Almutairi BJ, et al. Role of NQO1 Gene Involvement and Susceptibility of T2DM Among Saudi Arabia Population. Rejuvenation Research [Internet]. 2024 Oct 1;27(5):145–53. Available from: http://dx.doi.org/10.1089/rej.2024.0032
29. Braley M, Pierce JS, Saxena S, De Oliveira E, Taraboanta L, Anantha V, Lakhan SE, Kiran S. A virtual, randomized, control trial of a digital therapeutic for speech, language, and cognitive intervention in post-stroke persons with aphasia. Frontiers in Neurology. 2021 Feb 12;12:626780.
30. Guo Y, Albright D. The effectiveness of telehealth on self-management for older adults with a chronic condition: a comprehensive narrative review of the literature. Journal of telemedicine and telecare. 2018 Jul;24(6):392-403.