COVER PAGE AND DECLARATION

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MGT590: Business research - action research.

Post-Acute Care Transition Program to control hospital re-admissions for newly discharged high-risk co-morbid Patient "PACT".
An action research.

ABSTRACT: Preventable hospital re-admissions are indicators of health system that is linked with insufficient care outcomes and avoidable medical spent. The study explains the potential of modified care program to illustrate this problem through better coordination and improving transition of newly admitted comorbid high-risk patients from hospital to community care.

Study sites included two secondary medical facilities "Dr. MF Hospital and IDMC" along with one Long-term health care organization. The selected centers equipped bundles of interventions with multidisciplinary teams to improve communication efficiency, educate patients and caregivers, in addition to transition of care infrastructure. The results showed increase in the time required to hospital re-encountering in the studied sample with reduction of 30 days re-hospitalization by 46% for selected patients' segment admitted to control complicated heart failure "HF" with comorbidity and special medical needs. Implementing this model requires supportive changes in insurance benefits, payment terms, operations' policy and aligned incentives framework between payers and healthcare providers.

Background and Literature review:

Introduction and problem definition:

This paper describes the details of the practitioner-payer engagement process to implement a consolidated clinical care post-hospital discharge within three hospital facilities in Jeddah. We took a pragmatic quality improvement approach as the defined fragmentation of healthcare can adversely affect patients' care experiences and outcomes while increasing the cost of care. (Shih et al., 2006).

The system is missing an effective care transition that can improve the level of care and prevent unfavorable outcomes, which will end up with an increase of the avoidable hospital re-admissions.

Complexity of navigating the healthcare system, especially for elder patients, makes a compelling case for coordinated hospital discharge practice to link it with community services for the sake of providing seamless care. (Shih 2006, McDonald 2007).

Transition phase and discharge process are critical phases for elders where wrong/improper practices related directly with unsatisfactory outcomes. Without standard process coordinating touch points of patients' journey, the patients face higher risk of elongated stay inside the hospital, increased morbidity, frequent visits to emergency department and eventual increase of rehospitalization rate. (MedPac, 2007).

Rehospitalization is a cost intensive and can be prevented (Hansen L., Young R.S., Hinami K. et al., 2018). As many as 22% of hospitalizations come as a result of re-admission in less than 30 days after discharge due

to improper coordination between inpatient and primary care functions in addition to ineffective communication with the patients and with the caregivers (Liu S. and Pearlman D., 2009).

Interventions focused on post-discharge phone calls/home visit have proven to enrich patient satisfaction, solidify continuity of care, open communication channel for the patients to raise inquiries and get involved in management plan and ease the outpatient follow-ups if needed to prevent adverse events and readmission (Bloomberg G., Trinkaus K., Fisher Jr. et al., 2003) (Kasper J., Watts M., 2010).

Literature review:

Patients after hospitalization especially elders or of special needs suffering from chronic conditions are considered at more risk (Mahoney et al 2000; Meinow et al, 2005). A fundamental body of literature over the last 25 years has focused on patient transition and the discharge process hospital to home whit focused research on patient readiness for discharge. (Weiss et al 2006; 2007; Coffey & McCarthy 2012; Brent & Coffey, 2012). Interventions to improve the process (Chapin et al. 2014, Saleh et al.2012, Schuller et al, 2014), and testing the interaction between acute care services and community care facilities (Arbaji et al., 2008; Coffey & McCarthy, 2012; Johnson et al., 2013).

Different service delivery models have been described in the literature including Rehabilitation and Intermediate care in the UK (Dahl et al., 2014) and Hospital at home in the US (Sheppard et al., 2010).

A number of factors have been associated with delayed discharge including patient characteristics (Challis, Hughes et al. 2014); organization of care in hospital (Glasby, et al., 2006); Accessibility of community services and long-term care facilities upon discharge (Gallagher et al. 2008).

In Swede, Swanson (2013) reported that higher percentage of older population has increased delays in hospital discharge in some areas but cities with better nursing care had fewer delays. However, evidenced studies confirmed that the delays in patients' discharge have an increased risk of negative medical outcomes like; increased anxiety (Kydd, 2008), higher exposure to hospital acquired infection and physiological function impact (Hendy et al, 2012).

As reported by subject matter experts on delayed discharge in Scotland; the longer the delay in hospital discharge the greater the possibility of patients' dependency therefore, ways of preventing avoidable admission must be explored (Joint Improvement Team, 2010). Best practice adapts the concept of early detection of challenges that may delay patient discharge and identify proper interventions that keep elders stabilized out of hospitals. (HSE, 2013).

Health Care Operations (HCO) strive for excellence of care to all patients with a dedication to improve the quality and patients' safety practices. Driscoll et al. 2015; stated that separation of clinical services away

from patients' care lines is existing in inpatient setting nevertheless, working in silos without coordination deprives patients to get the comprehensive and optimal healthcare level. When medical disciplines create barriers working separately from one another, it results in miscommunication and collaboration, which negatively affects patients' health outcomes as evidenced by Driscoll's study at Midwest Academic Center where he discovered a higher diversion in Neuroscience unit with complex patients' journey and safety risks. The study proposed planned primary and secondary options for admitted patients to help utmost safety with flawless bed occupancy. Strategic interventions like seasonal forecasting and daily occupancy, proved to control internal diversions.

On the other hand, enhanced communication has resulted in a 52% reduction of internal patients' diversion to alternative care units. Driscol reported that; process improvement has enhanced the collaboration between care staff across the entire organization saving patients from navigating across a fragmented, unbundled and incomprehensive healthcare system.

Boundary spanning practices can maintain effective IP collaboration/communication to ensure silos free environment. Ehrlich, Muenchberger and Kendall (2012) have done a qualitative study to conclude an understanding of the difference between regular chronic care management and Chronic Care Coordination where they have interviewed ten GPs (general practitioner) and six RNs (registered nurses) operating in an Australian community based facility providing complex care facilitation/coordination, Four processes emerged to classify Care Management (CM):

- Relationship based care.
- Spanning boundaries to improve routine practices of health care.
- Established roles.
- Commitment to chronic care coordination.

Results have confirmed that proper CM depends on ability to standardize the process of shifting across boundaries to get best clinical outcomes. (Ehrlich et al., 2012).

Boundaries spanning encompass cooperation and inpatient communication for better organization of care. Based on Ehrlich et al. (2012) study, CM role clarification and education need more exploration and confirmed that the practice of boundary spanning consisted of Person & Family, Public health community Primary Care, and Healthcare system that can create a better connection and integration to optimize the routine care and crystalize the care management process.

Hansen's literature review found considerable variation in the type, protocol and number of activities adopted in initial studies with highest frequency of single activity regimen and almost 30% of the regimens have tested a bundle of three or more activities.

In general, he concluded that the ability of study sites to implement an activity depends on its control on the resources. For example, the ability to have follow-up visits properly scheduled and timely conducted depends on the capacity and availability of primary care physicians (PCP), which can be difficult unless the physicians affiliated with or employed by the institution or a specialized caregiver.

Overall study aim:

The confirmed poor quality of care postdischarge with high rate of readmission required a robust intervention with more focus on the level of medical care. This is to examine how the proposed post-acute care services and activities supported the concept of integrating cross-functional care processes to help high-risk comorbid patients health be maintained , restored or rehabilitated without a need for rehospitalization.

The study

The study adapted an action research process as per Practice-Research Engagement (PRE) (Brown, 2001).

Brown explains PRE as a collaborative process between both researchers and practitioners to work out a problem and could recruit appropriate participants related to the problem and that will help establishing a common goals, values and expectations that enhance the joint work supporting PRE, enhance engagement to maximize efficiency and learning for the resources participating in process development and execution.

The action research guided by literature confirming that research aimed for practical systems' change cannot generate knowledge or improvement without engaging with practitioners (Batliwala, 2003; Brown et al., 2003; Lindsey, Sheilds & Stajduhar, 1999; Reason & McArdle, 2006).

Prior to launching the project, we established a baseline audit based on investigating the quality of services and the rate of hospital readmission recorded in hospital information systems recorded data. Then, we engaged with policy makers along with clinicians to design and implement the PACT program (Brown et al., 2003).

The audit of 392 medical records of admitted patients selected from the study sites has proved unsatisfactory level of care and quality postdischarge with high rate of readmission. The average time to review records was 90 minutes for each patient.

Cycles of action research:

1) Planning

We used overlapping and cross-walked action research cycles, planning, implementation, and evaluation activities in each setting and directed the interactions of Bupa researcher with different levels of participants (Davison, Kock, Martinsons 2004; Meyer 1993).

Interviews and focus groups conducted with the staff of participated hospitals "study site", has enabled to add more data and facts to examine the post-hospital discharge service and its impact on the patients' health records.

We involved health leaders, clinical/ medical directors, hospital managers and clinicians in planning and execution to ensure full commitment and cooperation in achieving the overall study aims (Brown, 2001; Evans, 2003; Brown et al., 2003; Larrabee, 2004). The drafted plan meticulously reviewed, challenged and amended before having grand meeting with all stakeholders to get final approval for implementation.

2) Practice-research group formation:

The formation phase of PRE group started in January 2021 and continued until December 2021 to finish early cycles of action research i.e. diagnosing and planning. Bupa researchers created the conditions for democratic dialogue properly among the participants included in each group (Reason & McArdle, 2006).

Bupa researcher dedicated all efforts to found, establish and strengthen the relationships between all study partners and maximized the engagement and involvement in each step early beginning of the project (Himmelman, 2001).

Funding and Sustainability:

Bupa as payer, is funding medical care and services under the umbrella of innovation and Home Health Care "HHC" Program.

Method:

Sample selection and recruitment:

The recruitment site was the acute care department exemplifying the first contact point to do risk stratification using LACE and RSCM scoring tools to qualify initiating post-acute care activities such as home health care, Telemedicine, Physiotherapy or home based lab. Services according to the risk score of readmission, the medical need and inclination of the patients or the caregivers. Initial target sample was 70 patients and 70 caregivers. Unfortunately, only 51 patients and 42 caregivers have been reached.

Table 1: Patients' sample

Discreption	Column2
•Sample size.	51 Patients
•Average age group.	59-75 yrs
•Average number of comorbidities.	5 diseases
•Average number of medications per patient.	5-13 Meds.
•Total number of admissions in one year.	166 admissions
•Average number of admissions per patient in one year.	3.3 admissions
•Total number of OPD visits.	1166
•Average number of OPD visits per patient.	24 Visits
•Total number of ER visits.	265 Visits
•Average number of ER visits per patient.	5 Visits
•Average LACE score.	13
•Average RCSM score.	12
•Calculated average risk of readmission.	30%
•Total annual cost consumed by sample patients.	11M SR
•Average annual cost per patient.	200K SR

Study Design and Data Collection:

This was primarily an exploratory study using a prospective, longitudinal and mixed approaches to evaluate the outcomes resulted of an intervention activity for the sake of improving transition to home from acute care unit. The study implemented in three hospitals as tertiary care hospitals in Jeddah. Bupa Clinical Excellence doctors (BCE) formed a multisector steering committee to improve discharge process and patient transition. This steering committee encompassed geriatricians, acute care, GPs, data analysts, transition services' representatives and supervised by BCE.

Phase 1: Focused on Acuity of the admission, Charlson comorbidity index and selection of length of stay (LOS) to identify patients' who are at risk for readmission after discharge to develop customized discharge protocol.

 In phase 2: All patients in the Medicine Program between May and September 2021 were included in the study. Patients categorized as per LACE Index but they didn't share in study design, conception or revision of the results however, patients were involved in the implementation.

BCE data collectors conducted semi-structured interviews at multiple time and points where patients moved across points of service within the health care system and completed 89 interviews with 70 hospital admitted high-risk patients aged 45 years and above, 64 interviews with 49 family caregivers, and 76 interviews with 72 different healthcare professionals (HCPs).

Establishing shared/common objectives and goals:

Common framework, goals and objectives managing PACT project have been established as an outcome of frequent discussions, negotiations, pressure testing and modifications of project content based on steering group recommendations. (Brown, 2001)

Brown protocol resulted in good level of participants' commitment and confirmed that own interests has been achieved by their participation and share in the research (Lindsey et al., 1999; Brown, 2001; Batliwala, 2003; Brown et al., 2003).

Implementation

The Steering Group led the study, provided formal approval, encouraged hospitals to participate, and aligned the hospitals' directors to hold themselves accountable and involved in project implementation. This assisted to limit negative drawbacks of unequal level of participation, and sustained the collaborative relationships between researchers and participants (Brown, 2001; Brown et al., 2003).

1) Intervention:

The implementation consisted of stratifying patients' risk of readmission and initiate PACT cycle for high-risk patients to provide care coordination for 30 days after discharge.

Scoring wave 1:

LACE scoring concluded on the third day of admission and shortlisted patients with score of 10 or more as a high-risk sample then, the scores logged and recorded in database and alerted to PACT team.

Scoring wave 2:

On discharge, the score obtained again considering LOS during admission, scored 13 or more flagged as high potential readmission risk, and offered coordinated care regimen consisted of:

- Follow-up booking with the PCP within a week after discharge.

- Follow-up phone call (done by coordinator) to support and check on the patient's free accessibility and compliance to discharge checklist instructions (Figure 5) , medications, equipment, homecare, meals, follow-up appointments and level of satisfaction with discharge process.

Bupa researchers acted as transition coordinator being qualified physicians with registered medical degrees, already trained by Geriatrician on LACE stratification and shared in developing the standard script of

outbound call after discharge. Thereafter, they acted as liaison and communication planner linking the patient to his care to assure smooth transition and program success. *(Table 1&2)*

- IDMC hospital: Many elders and their families have challenges controlling Diabetes, Hypertension and Dyslipidemia comorbidity triad *"Triad"*, a prevalent condition that has exacerbation attacks subsequent to cultural, lifestyle or improper treatment.

  Patients admitted with *Triad* were frequently readmitted which, indicates existence of missed opportunity to intervene and address poor *Triad* control among insured elders in Jeddah region.

- Dr. MF Hospital "Dr. MFH": One-quarter of patients who hospitalized with (HF) are readmitted again with same complaints within 30 days and one half are within 6 months, which reflects difficulties the patients and caregivers are facing to manage complex conditions (Kasper et al., 2010).

- CCC Hospital: Bupa and CCC created a managed care organization that offers a Long-term Care (LTC) regimen to support frail patients as long as possible to remain home safely. A transitional care team works with hospitalized patients after discharge to extend medical care services and to help control readmissions.

Study sample comorbidities:

Table 2. Health Status of patients Sample.

Patient profiling (n=51)	n (%age)
Exsisting chronic disease (Av.=4)	
01 Chronic diseas:	1 (2%)
02 Cronic diseases:	2 (4%)
3 Cronic diseases:	2 (4%)
4 Cronic diseases:	45 (88%)
05 Cronic diseases or more:	1 (2%)

2) Program features:

Planned research settings, goals, objectives, project team, timeline, population sample, and results of these interventions summarized in *Display 1*. The three study sites followed the multidimensional methodology and approach of boundary spanning and engaging concerned disciplines across care setting.

To provide a common framework for describing these programs, we analyzed their components using a taxonomy adapted from Luke Hansen and colleagues, who classified readmission interventions into pre-discharge, post-discharge, and bridging domains *(Display 2)*. We modified the framework to consider adding core activities in light of the case studies.

2.1) Pre-discharge activities or extended care:

The literature classified four activities occurring before discharge defined as "pre-discharge phase" where the patient get educated on self-care, reconciling and revision of take home medications, identifying the postdischarge medical/social needs and scheduling a follow-up Tele-consultation.

This protocol has been adopted in the three study sites however, it was not limited to inpatient but medication reconciliation for example conducted in multiple settings; the outpatient, inpatient, or at home during the visit depending on study scope and approach of services.

These activities usually were part of care coordination management that extended from inpatient care to pass through after discharge as transitional care. Such as, teaching self-care is a key activity for IDMC hospital and for CCC where the care managers have established connections with their patients that extends after discharge.

The extended care protocol discussed with the patient and/or the family and usually started inside the facility before discharge like the case in Dr. MFH explaining the goals and objective of the program, treatment choices and predicted benefits.

CCC palliative care program is comprehensive in its approach as it takes-on the characteristic of bridging activity, as described below.

Risk stratification methodology standardized across the study sites but varies from a facility to another as one hospital may adopt extra factors like previous hospitalizations, medication compliance, case complexity or comorbidity, and psychosocial factor and needs to customize the required level of care and management or other services to be provided. For example, IDMC uses Stroke recurrence modified TOAST risk classification tool either for outpatients' visit or during admission along with LACE scoring system to guide patient education and determine service needs.

2.2) Post-Discharge Activities

Post-hospitalization / discharge program varied based on risk score and capacity that may encompass interventions like preset communication with the PCP, a discharge hotline, a follow up teleconsultation, and/or home visits yet; BCE team has discovered that building a careful relation with admitted patients is crucial to have efficient extended follow-up medical care and outcomes.

The three study sites worked out and secured home health care service available as a fundamental to keep the patients independent and safe at home without frequent rush to hospital premises.

For a fact, elder patients with "HF" and complicated Diabetes are frail; BCE PACT Team along with Dr. MFH have created a new policy to make follow-up care as a default for all "HF" patients discharged to their

homes regardless of LACE score. In addition, Bupa will cover the cost of home visit in rare cases when it's not covered by the patient's insurance.

2.3) Bridging activities:

Study hospitals have followed bridging boundary activities as defined by Hansen literature; emphasized longitudinal relationship with the patient before and after hospital discharge along with shared role from the patient and caregiver to secure safe transition and reported clinical findings in each step of the journey. Both two secondary hospitals research sites worked to improve patient centered discharge instructions, despite that the approach could be less intensive than defined in the published studies.

The role of data technology and information management played a key role across bridging activities for example; Bupa used secure electronic messaging with Dr. MFH to create virtual care teams among inpatient clinicians and postdischarge home care facility communicating data , progress and clinical updates when patients roam across points of service.

In general, BCE affiliate with the nurse practitioners and home care physicians to steer a smooth transition and collaborate with points of service and the patient for up-to 45 days after discharge.

Evaluation

The evaluation of PACT program implementation across study sites began in September 2021 and finished by having a meeting with all leaders in December 2021. We assessed Immediate/very short-term along with the longer-term study outcomes using data audit and records' benchmark, crosscheck focus groups then we analyzed collected based on the frequency and strength of responses.

All findings shared with the action steering and leadership groups in each hospital and overall results were presented in result committee hosted and facilitated by Bupa, which has indicated a satisfactory success of engagement process in the practice research (Brown, 2001).

Analysis and Outcome measures:

The study is multidimensional and outcomes have different levels of measurable outcomes based on the developed evaluation framework to encompass the following; degree of improvement in experience for the patient and his family, reduction in A&E. revisits and in hospital readmissions at 30 days of discharge in addition to improvements in coordination of health services among selected hospitals. During the engagement call, the collected data denoted if the patient has been oriented and understood the discharge instructions or not, picked up his/her medications, in need for follow-up appointment with PCP , and if applicable, the required equipment is delivered and/or connected with home health care facility.

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Patients and their caregivers surveyed for their satisfaction with done intervention, all data gathered during calls, and through HIS (Hospital information system), we collected, refined and recorded as an aggregated data.

Data collected from a comparable group of high-risk patients (n=433), admitted from January 2020 to September 2020 and have not had the interventions and LACE scores were done retrospectively after hospital discharge. This has been considered as sort of control group that have the same sample's criteria being admitted at the same medical units in same study hospitals.

The changing nature of partnership in PRE:

Exchanging information for the sake of mutual benefit and amending transition activities based on patients' health status and response is a common purpose of the study to build trust and confidence between practitioners and researchers. This has obviously demonstrated in the proper relations established between hospitals' managers, patients and the researchers. It led to smooth planning and implementation of PACT program that confirms what Himmelman, 2001 has stated that cooperation involves the exchange of information, altering activities and sharing resources for mutual benefit and a common goal.

Results:

1) ***Overall***

Recorded data confirmed that one 1621 patients has been discharged from internal medicine in study sites from February 2020 to June 2021. Four hundred and thirty three patients (27%) classified as a high-risk group and strongly liable for rehospitalization as confirmed by LACE tool scored 13 and above.

The study sites reported promising results associated with their intervention that eventually has given a better clinical outcomes and controls on the chronic diseases and patient's quality of life.

Elder patients with heart "HF" at Dr. MFH had 64 % relative reduction in 30 days "HF" readmission rate, from 24% in 2020 to 9% in 2021.

Bupa beneficiaries with special needs enrolled in Chronic Care Center "CCC", had 51% reduction of readmission rate for 30 days after discharge versus the average yearly rate of 28% during 2020 to 14% during 2021.

Among a cohort of high-risk patients who received intensive care coordination services at IDMC, the average time between discharges until emergency department revisit or readmission has increased by 93 days during the study period, from Jan. 2021 to Nov. 2021.

2) *Post-discharge phone calls*

73% (n=70) of the high-risk patients successfully engaged by follow up outbound calls. 53% of calls done by assigned PACT hospital staff directly with the patients (n=27) and 47% with caregivers (n=23).

99% of the patients has a first outbound call in three days post-discharge (n=50). On the other hand 99% of the patients and caregivers rated the engagement calls as beneficial and helpful (n=92).

92% of patients (n=47) and 93% of caregivers (n=39) stated that they understood the given instructions on discharge (Table 2). The notification of discharge was mailed to 98% (n=50) of Home Care facilities.

77% (n=333) of the patients stratified as potential for re-hospitalization are of "HF" and found co-morbid as well. The PACT's unit staff were able to secure appointments with PCPs 'Shred in the program" for 55% of the patients (n=26) before patients were discharged.

78% of the patients (n=40) had booked follow up home visit or Telephonic consultation appointments through BCE, unit staff or caregiver - with their PCP or a clinical specialist.

The remaining 22% (n=22) of patients had telephone call without home visits. (*Listed Tables 3, 4&5*).

Policy implication

Deploying PACT program and implementation at other health care providers depends on the leadership, organizational infrastructure and quality improvement willingness, the ability to secure internal and external resources to support change, and size of the target patient population.

Bupa the market leader and top insurance payer is obsessed to control the frequency of readmissions as a critical indicator of health outcomes and to reflect the patient centric organizational purposes that Bupa strives. However, Bupa has an ambition to reform the national health insurance practice securing best customer experience, clinical results with reasonable medical spent. The current fee for service practice drives hospitals to have more incentives to support deploying PACT program because it's not financially viable unless the evacuated beds been utilized with other admissions to cover the operations' cost and have a profit margin.

Populating the cross boundary health care management requires a drastic change in payment process, policy and procedures with agreed incentive slabs between insurance payers and hospitals in addition to shifting the market practice into a pay for performance and shared profits approach rather than the fee for service. Likewise, the practice in the States, a Sacramento health care organization reported 17% decrease in rehospitalization in retirees group during a pilot program that adopted the same concept of incentivizing the coordinated care among the study sites, payer and physicians applied the program. In addition to a study done on Medicare practice suggesting to have a new approach of paying the average cost of hospital

admission along with 30 days follow up costs as package for "HF" patients and using effective "HF" disease management protocol same as used in control trials. Medicare will have viable commercial saving of 96-875 USD per patient by reducing 30 days rehospitalization after initial discharge.

Re-budgeting and optimizing the resources towards primary care as a cornerstone of system reform will have positive impact on accessibility to proper preventive care, proper chronic disease management and coordinated care services that will help delaying and preventing complications subsequent to chronic diseases.

Discussion, Limitations and Conclusion:

The study aimed to examine how post-acute transition coordinated care and services could help provide, organize and integrate efforts across hospital units and care sittings from A&E. or acute care to home safely and help patient to restore, maintain or rehabilitate his health and wellbeing.

1) *Hospital Readmissions and Visits to Acute & Emergency Department (A&E.):*

Historical data shows that 55.9% of patients who had acute medical event and hospitalized for close medical management are not readmitted or visited A&E. over 12 months after hospital discharge however, 26.5% of this group and 5.9% got readmission into hospital and A&E. respectively within 90 days after initial admission. Despite the small sample size, the percentage is not too far different from a USA studies conducted by Medicare and Medicaid starting 2012 with a 600 patients' sample, which found that the readmission rates has been reduced by almost 30% through the transitional care pilot program (Choo, 2018).

2) *Limitations:*

Small sample size is a key limitation of the study, which restricted the types, and volume of statistical tests to check on all variables and conclude logic relationships. Because of differences in measurement methods and sample size, we could not benchmark the three hospitals' performance.

The study results depended on time series data, case-mix and comorbidities but has missed the classical control group for comparison yet, the reported results are in-line with published international studies.

The local factors may affect the results as it may change and differ if the program implemented at other facility. As a capability, the hospital can track the admission and readmission events happening at their facility but will not be able to trach same incidents at other facilities, which points to the national need of having common and regulated databases so that hospitals can assess system wide the value of efforts to control re-hospitalizations incidents.

Furthermore, the patients' own perception on clinical outcomes using a modified PROM "Patient reported outcome measures" is needed in future studies to get patients more involved in the medical practices and improvement programs.

3) *Recommendations for Future Study:*

Future studies may need to have bigger sample size and consider the following:

a. Stresses on caregivers when the patients' situation requires intensive level of care, which may reflect on service satisfaction rates.

b. Health condition and patient dependency as a factor to predict frequency of post-acute care services usage.

c. Prior planning and psychological preparation predict better coping of patient and caregiver.

d. Identify relationships between different variables in the study results as per original research proposal and test service distribution over time at different study sites may give more comprehensive outcomes.

Conclusion

Level of engagement in the Practice research was effective in compiling all insights regarding best practice with advanced analytical tools to achieve research goals, standardize knowledge and serve practice improvement. It also helped learn about managing a process of change that ultimately could improve the healthcare system (Brown, 2001).

Health professionals had some resistance to change discovered by Bupa researchers mostly coming from the lack of details and knowledge of holistic view of PACT and to some extent as a fear of the unknown. Understanding the key areas of change management and how to avoid obstacles are critical to project success (Handly, Grubb & Keefe, 2003; Howardell, 2006; Linton, 2002).

Despite the small sample size, this action research explored initial steps to examine the transitional care programs in a systematic and longitudinal manner.

The key outcome of Care Transition program is keeping quality of life maintained for both the patient and his caregiver with controlled hospital use and reduction of inpatient overutilization balancing it with coordinated care and proper transition.

The case study showed criticality and need for articular change in health system to promote such multifaceted, boundary spanning approach over the isolated interventional approach typically inefficient in reducing readmission incidents or hospital use as confirmed by published studies.

Cross implementation of PACT program as a systemic care will require national effort and support to amend the payment terms, policy modulation and IT changes.

References:

- Arbaje A.I., Anderson, G.F., Powe N.R., Yu Q., Wolff J., & Boult C.E. (2008), Post discharge environmental and socioeconomic factors and the likelihood of early hospital readmission among community dwelling Medicare beneficiaries. The Gerontologist 48(4), 495-504.

- Batliwala S. (2003). Bridging divides for social change; practice research interactions in South Asia. The Organization, 595–615.

- Bloomberg G.R., Trinkaus K.M., Fisher E.B.Jr. et al., Hospital readmission for childhood Asthma; A ten year Metropolitan Study, American Journal of Respiratory Medicine, (2003) , 167(8) : 1068-76

- Brent L. & Coffey A. (2012), Readiness for discharge of patients following hip fracture surhert. International Journal of Orthopedic and Trauma nursing 17(4), 190-19.

- Brown L.D. (2001), Practice research engagement and civil society in globalizing world. Washigton, DC; the Houser Center for Nonprofit Organization.

- Brown L.D., Kunreuther F., Batliwala S. & Bammer G. (2003); Framing practice research engagement for democratizing knowledge. Action research, 1(1), 81-101.

- Brown R.S., Peikes D., Peterson G. et al. (2012) ; Six features of Medicare Coordinated Care Demonstration program that cut hospital admission of high-risk patients, Health affairs,June 2012 31(6); 1156-66.

- California public employees' retirement system, integrated health care pilot exceeds expectations, Press release, April 12, 2011.

- Chetty V.K., Jack B.W., Anthony D. et al., A reengineered hospital discharge program to decrease re-hospitalization. A randomized trial, Annals of internal medicine, Feb. 3, 2009 150(3); 178-87.

- Challis D. et al. (2014); an examination of factors influencing delayed discharge of older people from hospital international journal of Geriatric psychiatry 29(2), 160-168.

- Chapin R.K. et al. (2014); Hospital to community transitions for adults; discharge planners and community service providers' perspectives. Social work in health care 53(4), 311.

- Coffey A., McCarthy G. (2012); older people's perception of their readiness for discharge and post discharge use of community support and services. International journal of older people nursing, 8(2), 104-15.

- Coffey A., McCarthy G. (2012) Community supports used by older people following discharge. British journal of community nursing, 17(4), 170-176.

- Coleman E.A., Parry C., Chalmers S. et al. , The care transition intervention; Results of randomized controlled trial, Archives of internal medicine, Sep. 25 , 2006 166(17); 1822-28.

- Curtis L.H., Greiner M.A., Hammil B.G. et al., (2005); Early and long-term outcomes of Heart failure

"HF" in elderly persons, 2001-2005, Archives of internal medicine, Dec. 8, 2008 168(22); 2481-88.

- Dahl U., Steinsbekk A., Jenssen S. & Johnsen R. (2014); Hospital discharge of elderly patients to primary health care, a qualitative study of health professionals' experience. International journal of integrated care.

- Davis K. and Shih et al. (2006); Organizing the US healthcare delivery system for high performance (New York; The commonwealth fund, Aug. 2008).

- Driscoll M., Tobis K., Gurka D., Serka D., Serafin F. & Carlson E. (2015); breaking down the silos to decrease internal diversions and patient flow delays. Nursing administration quarterly, 39(1).

- Ehrlich C., Kendall E. & Muenchberger H. (20012); spanning boundaries and creating strong patient relationships to coordinate care are strategies used by experienced chronic condition care coordinators. Contemporary nurse, 42(1), 67-75. Doi: 10.5172/conu.2012.42.1.67.

- Eapen Z.J., Reed S.D., Curtis et al., (2001); Do Heart Failure "HF" disease management programs make financial sense under a bundled payment system?, American Heart Journal, May 2011 161(5):916-22.

- Epstein A.M., Orav E.J., and Jha A.K., " The relationship between hospital admission rates and rehospitalization" , New England Journal of medicine, December 15, 2011 365(24); 2287-95.

- Fox P., Porter P.G., Lob S.H. et al.,(2007); "Improving Asthma related health outcomes among low income , Multiethnic , School aged children". Pediatrics, October 2007 120(4); e902-e911.

- Gallagher P., O'Callaghan N. & Henry C. (2008); Do relatives of elderly patients' block the discharge process, Irish medical Journal 101(3); 70-2.

- Glasby J., Pryce K. & Littlechild R. (2006); Delayed hospital discharge and older people. Journal of health services research & Policy 11(1), 52-58.

- Handly M.J., Keefe N. & Grubb S.K. (2003); Essential activities of implementing a clinical information system in public health nursing. Journal of nursing administration, 33(1), 14-16.

- Hansen L.O., Young R.S., Hinami K. et al., (2011), "Intervention to reduce 30 days rehospitalization; A systematic review, Annals of Internal medicine, Oct. 18, 2011 155(8); 520-28.

- Hendy P., Kordbacheh T., Patel J.H., Laskar N. & Harbord M. (2012); in depth analysis of delays to patient discharge; A metropolitan teaching hospital experience. Clinical medicine 12(4), 320-323.

- Himmelman A.T. (2001); On coalition and the transformation of power relation; American Journal of community psychology, 29(2), 227-284.

- Howardell D. (2006); overcoming people's fear of change.
  Retrieved from: www.theacagroup.com/overcome.html

- HSE East, Dublin. Doran K.M., Ragins K.T., Gross C.P., & Zerger S. (2013) ; Medical respite

programs for homeless patients; Journal of health care for the poor and underserved 24(2) , 499-524.

- Iles V., Sutherland K. (2001); Organizational change; a review for health care managers, professionals and researchers. London; NCCSDO.

- Jiang H.J., Wier L.M., Potter E.D. et al., (2008) , Hospitalizations for potentially preventable conditions among Medicare & Medicaid dual eligible, Statistical brief #96 (Washington D.C ; Agency for healthcare research and quality, Sep. 2021).

- Jencks S.F., Coleman E.A., Williams M.V. (2009); "Rehospitalizations among patients in Medicare fee for service program", New England Journal of Medicine, April 2, 2009 360(14); 1418-28.

- Joint improvement team (2014) , Joint team (2010). Scotland delayed discharge retrieved from: www.jitsctland.org.uk/action-areas/delayed-discharge/109.

- Kasper J., Lyons B., Watts M.O. (2012); Chronic disease and comorbidity among dual eligible; Implications for patterns of Medicaid and Medicare service use and spending.

- Kuhmerker K. and Hartman T. (2007); Pay for performance in state Medicaid program; a survey of state Medicaid directors and program; "New York: The commonwealth fund, April 2007".

- Kydd A., (2008); the patient experience of being a delayed discharge. Journal of nursing management 16(2); 121-126.

- Lindsey E., Sheilds L., Stajduhar K. (1999); relating community development to participatory action research. Jpurnal of advanced nursing; 29(5); 1238-1245.

- Linton J.D. (2002); Implementation research; State of art and future directions. Technovation; 22, 65-79.

- Liu S.Y., Pearlman D.N. (2009); "Hospital readmission for childhood asthma: The role of individual and neighborhood factors, Public health report, Jan.-Feb. 2009 124(1); 65-78.

- McDonald K.M., Sundaram V., Bravata D.M. et al. (2007); a critical analysis of quality improvement strategies, Vol. 7; Care coordination (Rockville, Md.: Agency for healthcare research and quality; June 2007).

- McMurray J., Elliott J., Bytne K., Hicks E., Johnson H., Stolee P.(2013); " The collision of information systems in transition with patients in transition". Health inform J 2013; 19:218e232.

- Medicare payment advisory commission, "Payment policy for inpatient readmission"; in report to the Congress: Promoting greater efficiency in Medicare (Washington D.C: MedPac, June 2007).

- Melno Park, Calif (2010); coordinating the care of dual eligible beneficiaries, Chapter 5, report of Congress; aligning incentives in Medicare (Washington D.C.; MedPac, June 2010).

- Naylor M.D., Aiken L.H., Kurtzman E.T. et al. (2011); "The importance of transitional care in achieving health reform, Health affairs, April 2011 30(4); 746-54.

- Naylor M.D., Brooten D., Campbell R. et al. (1999); Comprehensive discharge planning and home follow up of hospitalized elders, Journal of the American medical association, Feb. 17, 1999 281(7):613-20.

- Naylor M.D., Kurtzman E.T., Grabowski D.C. et al. (2012); Unintended consequences of steps to cut readmission and reform payment may threaten care of vulnerable older adults: Health affairs, July 2012 31(7):1623-32.

- Phillips C.O., Wright S.M., Kern D.E. et al., (2004); Comprehensive discharge planning with postdischarge support for elder patients with congestive Heart failure"HF": A Meta-analysis: Journal of American medical association, March 17, 2004 291(11):1358-67.

- Reason P. & McArdle K.L. (2006); Action research organization development. Retrieved from: www.bath.ac.uk/mnspwr/paperslist.htm

- Saleh S.S., Morris Dickinson G., Friere C. & Shannon T. (2012); an effective and cost benefit analysis of a hospital based discharge transition program for elderly Medicare recipients. Journal of the American Geriatric society 60(6), 1051-1056.

- Schuller K.A., Lin S.H., Gamm L.D. & Edwardson N. (2014); Discharge phone calls; A technique to improve patient care during the transition from hospital to home. Journal of Healthcare quality. Retrieved from: www.onlinelibrary.wiley.com/doi/10.1111/jhq.12051/citedby.

- Swanson J.O.H. (2013); Bed blocking and the city within the municipality of Oslo, Reimbursement policy retrieved from www.duo.uio.no./handle/10852/35911.

- Weiss M.E., Ryan P. & Lokken L. (2006); Validity and reliability of the perceived readiness for discharge after birth scale. Journal of Obstetrics, Gynecology & Neonatal nursing 35(1), 34-45.
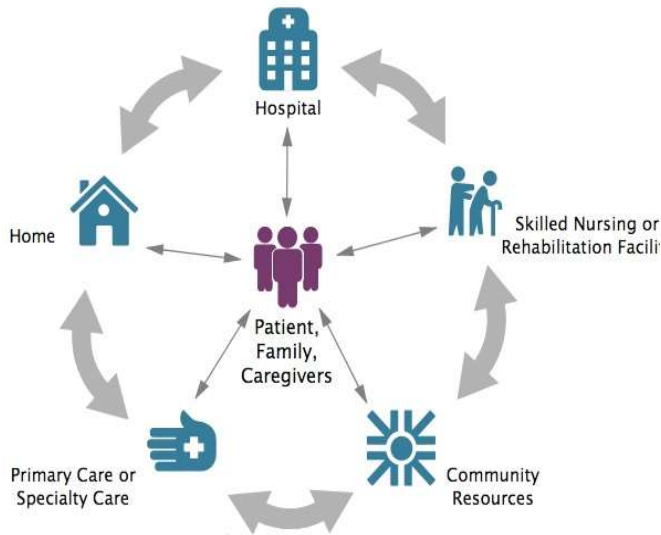

Appendices

Abbreviations:

BCE: Bupa Clinical Excellence doctors
CM: Care Management
GPs: General practitioner
HCPs: Healthcare professionals
HF: Heart failure
LOS: Length of Stay
HHC: Home Health Care
HIS: Hospital information system
HHC: Home Health Care
LACE: LOS , Acuity or ICU Admission, Comorbidity, Emergency visit
PACT: Post-Acute Care Transition
PRE: Practice–Research Engagement
RNs   Registered nurses
RSCM: Risk Stratified Care Management
Triad: Diabetes, Hypertension and Dyslipidemia comorbidity
TOAST: Stroke classification score " Trial of Org 10172 in acute stroke treatment

Figure 1:

Transitional care based of health status   **Patient health care Journey**
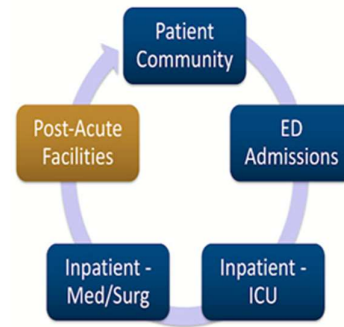
Figure 2:

LACE readmission scoring Tool   **PACT access channels & Pathways**

Modified LACE Tool

Attribute	Value	Points	Prior Admit	Present Admit
Length of Stay	Less 1 day	0		
	1 day	1		
	2 days	2		
	3 days	3		
	4-6 days	4		
	7-13 days	5		
	14 or more days	6		
Acute admission	Inpatient	3		
	Observation	0		
Comorbidity: (Comorbidity points are cumulative to maximum of 6 points)	No prior history	0		
	DM no complications, Cerebrovascular disease, Hx of MI, PVD, PUD,	1		
	Mild liver disease, DM with end organ damage, CHF, COPD, Cancer, Leukemia, lymphoma, any tumor, cancer, moderate to severe renal dz	2		
	Dementia or connective tissue disease	3		
	Moderate or severe liver disease or HIV infection	4		
	Metastatic cancer	6		
Emergency Room visits during previous 6 months	0 visits	0		
	1 visits	1		
	2 visits	2		
	3 visits	3		
	4 or more visits	4		
	Take the sum of the points and enter the total →			

Figure 3:

Lace Score, interpretation.

Baseline Readmission Rates by LACE Score

LACE Score	30-Day Readmission Rate	Risk	
1	0.0 %		
2	0.0 %		
3	9.1 %	Low Risk	5.7%
4	5.9 %		
5	6.3 %		
6	5.7 %		
7	8.7 %		
8	8.9 %	Moderate Risk	15.4%
9	24.8 %		
10	17.1 %		
11	15.7 %		
12	23.8 %		
13	22.0 %	High Risk	21.5%
14	32.0 %		
15	26.1 %		
16	31.8 %	Very High Risk	32.5%
17	33.3 %		

Figure 4:

RSCM Risk scoring tool

Risk-Stratified Care Management Scoring Algorithm

		Low Risk (0 points)	Medium Risk (1 point)	High Risk (2 points)	Score (0–2)
	Age	≤49	50–64	≥65	
Utilization	ED Utilization in Last Year	0–1	2	≥3	
	Inpatient Hospitalization in Last Year	0–1	2	≥3	
	Primary Care Visits in Last Year	1–2	3–6 or 0	≥7	
	Medications	0–1	2–4	≥5	
Chronic Disease	Chronic Illnesses	≤1 stable chronic illness	≥1 chronic illnesses with exacerbation, progression, or side effects of treatment or ≥2 stable chronic illnesses	≥1 chronic illnesses with severe exacerbation, progression, or side effects of treatment or ≥1 chronic illnesses that pose a threat to life or bodily function	
	BMI	BMI 18.5–24.9	BMI 25–39.9	BMI ≥40 BMI <18.5	
Behavioral & Mental Health	PHQ-9 Score	≤4	5–14	≥15	
	SUD	No history of SUD	History of SUD	Current SUD	
	Dementia/Alzheimer's Disease	Mini-Cog ≥3 or MoCA ≥26	Mini-Cog <3 or MoCA 18–25	Dementia/Alzheimer's diagnosis	
	Behavioral & Mental Health	No mental or behavioral health diagnoses or 1 mental/behavioral health diagnosis with long-term stability with medication demonstrated	1–2 mental/behavioral health diagnoses or 1-2 life stressors in the last 12 months (death of a loved one, divorce, move, job loss, etc.)	≥3 mental/behavioral health diagnoses or ≥3 life stressors in the last 12 months (death of a loved one, divorce, move, job loss, etc.)	
	Tobacco/E-cigarette Use	No history of tobacco/e-cigarette use	History of tobacco/e-cigarette use	Current tobacco/e-cigarette use	
Social Determinants of Health		Financially stable Stable housing Access to reliable transportation Adequate medical insurance Family or other support	Receives some support to meet social needs (WIC, food stamps, bus passes, etc.) Some medical insurance coverage Inadequate pharmacy coverage Lives alone and needs assistance with ADL	Lack of family support that impacts care Lack of financial support Lack of sufficient financial resources Lack of transportation Language barriers Low health literacy Low literacy Medicaid/Medicare dual eligible Undocumented status Unemployed Uninsured Unsafe home environment Unstable housing	
				Total Score	
				Risk Level	

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Risk level based on total score:
Low 0–4
Medium 5–10
High ≥11

Figure 5:

PACT discharge form

YOUR DISCHARGE PREPAREDNESS CHECKLIST

Please inform your Care Team if you have questions about the following:

	YES	NO
① I understand the medicines I am required to take, along with my refills.	☐	☐
② I understand my health condition(s).	☐	☐
③ I understand the symptoms to pay attention to after I leave.	☐	☐
④ I understand what actions to take if symptoms occur after I leave.	☐	☐
⑤ I have access to the appropriate equipment for my health condition(s).	☐	☐
⑥ I have transportation arranged for my discharge.	☐	☐
⑦ I have all my personal belongings (dentures, hearing aids, glasses, cellphone, charger, cane, meds, and money).	☐	☐

ESTIMATED DISCHARGE WINDOW:

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Figure 6:

Follow up PACT checklist

Medications Improvement Opportunities	Red Flags Improvement Opportunities	Follow-up, After Care Improvement Opportunities	DC Teaching Improvement Opportunities	Social Needs Improvement Opportunities
☐ No instructions(verbal or written) on new meds / PRNs ☐ Not clear if new med(s) "for now" or "forever" ☐ Med Reconciliation list incorrect/unclear ☐ Home meds incorrect/absent on DC Med List ☐ Doesn't understand purpose/ frequency of PRN meds ☐ Unclear what meds are new ☐ Unclear what meds/dosages have changed ☐ Not sure which provider to call with med questions ☐ How meds obtained was not assessed ☐ Delay in obtaining meds ☐ not taking, due to: ☐ Financial barrier: can't afford meds ☐ Transportation barrier: can't pick up meds ☐ Needs new medi-set delivered by local pharmacy ☐ Mail-order pharmacy: orders not faxed ☐ Short-fill not provided/set up ☐ Other:	☐ No Red Flag info provided ☐ Doesn't understand Red Flags ☐ No Red Flag parameters given (high and low BP, heart rate, blood glucose, weight gain or loss, etc.) ☐ Doesn't understand what to do if readings fall outside parameters ☐ Not clear which provider to call for what Red Flag ☐ Not clear how to get appropriate level of care after-hours ☐ Other:	☐	☐ Doesn't understand condition ☐ Unable to perform treatments as instructed ☐ Not clear if new treatment(s) "for now" or "forever" ☐ Doesn't understand lifestyle instructions ☐ Doesn't understand dietary instructions ☐ Supplies not sent home with patient: ☐ Other: **Written Information Given** ☐ Medical abbreviations used ☐ Lang/literacy/sensory barrier ☐ No written instructions on new meds / PRNs ☐ No written instructions on home treatment or home exercise program ☐ Other:	☐ Lives alone ☐ Needs Medicaid/ VA/other application ☐ Needs assistance in home: ☐ Patient is caregiver for another person ☐ New disability ☐ Transportation needs ☐ Basic subsistence needs: housing, food, utilities, etc. ☐ Homeless ☐ Meds: cost / access (see Medications column) ☐ Other:

[Please attach copy of Multi-Medication Discrepancy Tool®]

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Display 1. Case Study Program features

	IDMC Facility	Dr. MFH Facility	CCC Facility
Initiative	Diabetes , Hypertension and Dyslipidemia comorbidity	Heart Failure Disease Management Program	Long- Term Care Plan/ Special Needs Plan.
Study site	Integrated, for profit, academic medical center encompassing a 223-bed tertiary hospital, A&E D. and outpatient facilities, Including primary care clinics serving Jeddah area.	Tertiary center that has inpatient and outpatient eqipped facilities along with orimary care serving Jeddah region encompassing 453 beds.	Managed care facility serving adults residents in Jeddah, a for profit home health care.
Goals and Objective	Eliminate comorbidity related hospitalizations & emergency department (A&E D.) visits in the target population by Dec. 2021 by supporting improved chronic disease management across the continuity of care.	Reduce by 30% the rate of hospital Re-admissions for any cause within 7 and 30 days of a hospital discharge among the target population.	Improve access to appropriate care, help patients navigate a complex health care system, enable frail individuals to safely remain in their homes as long as possible, and reduce unplanned hospitalizations.
Target population	Comorbid, high-risk newly admitted patients who fulfill LACE Criteria.	Elder patients hospitalized with a primary or secondary diagnosis of heart failure along with at least 2 more comorbidities	Vulnerable and ethnically diverse Choice Health Plan members enrolled in a Long-Term Care/ Special Needs plan. Most members are elderly and suffer from multiple chronic conditions
Project management team	Multidisciplinary team led by Bupa CE team along with leaders from the medical centers' inpatient, outpatient, emergency, pharmacy, home health, subspecialty, and primary care units.	2 Nurse coordinators with cross functional team encompassing medical director, cardiologists, clinical nurse specialists, case Managers, pharmacists, dieticians, educators, primary care physicians, home care nurses.	A specially trained nurse care manager is assigned to each member to coordinate services from a multidisciplinary team including physicians, nurses, Physiotherapists, nutritionists, behavioral health specialists, clinical pharmacists, family caregivers, and community Services.
Approach	Redesign the care process & Activities to address key drivers of poor chronic diseases' control and associated preventable hospital use: 1) Notify managed care organizations of admissions and A&E.D visits to ensure coverage of and linkage to healthcare services. 2) Educate the patients along with the family on self-care. 3) Offer a 30 day supply of DM, HTN and related medications at discharge. 4) Mitigate risk factors like; environmental barriers and making referrals to community and home services. 5) Enhance care transitions through follow up schedule and timely updating primary care providers with patients' information and by instituting solid home health services to high risk patients to continue getting better level care at home after discharge. 6) Employ primary care coordination to help comorbid patients and their families to get rid of barriers to good chronic disease control.	Establish a proper transition process from hospital to home: Create an ideal transition from hospital to home: 1) Patient engagement for intensive education as teach back. 2) Plan follow up clinical appointments in 7 days after discharge or 3) Have an outbound call within same time frame based on patient's medical need. 4) Secure the needed services like Lab. tests by home care facility. 5) Data collection and analytics to measure the outcomes. 6) Update all stakeholders and communicate with health care providers for full alignment.	Integrate care across settings: 1) Comprehensive assessment of patients, usually at their homes. , often conducted in their homes. 2) Coatching care givers and patients on the best way to monitor vital clinical signs and safety netting. 3) Secure Cognitive,Psychological, Medical and Functional needs through continuous care plan with facilitating accessibility to Primary Care and hospitals if urgently needed. 4) Nurse visit post hospital stay. 5) Multidisciplinary meetings to amend plan of management based on patients' response and needs. 6) Schedule a palliative care service to life limiting chronic patients. 7) Regular risk calculation to amend the level of care to higher potential of hospial readmission. 8) Continuous training to PACT execution staff. 9) Data technology and Information management to support decision making and process monitoring.
Fund and Timeline	Bupa CE PACT program formed in July 2020 and launched its quality improvement teamwork in January 2021. The PACT initially operated without dedicated funding.	Bupa CE team and DSFH initiated the heart failure program in late 2020 for Healthcare Improvement and self-funded. The program will become self- sustaining.	CCC enrolled patients in LTC "long term care" plan in July 2020. Moreover, planned to continue under Bupa CE supervision shifting LTC cases hospital to home under modified PACT criteria.
Success parameters as reported by the study sites	Among a cohort of high- risk patients receieved coordinated care services, the average time for hospital revisit either to A&E. D. or readmission has increased by 90 days starting May 2021 till November 2021	Within the target population, there was a 64% deacrease in 30 days readmission rate secondary to Heart failre from 24% in 2020 to 9% in 2021. Likewise, there is a provisional 35% decrease in 90 days Heart failure readmission rate as of 40% in 2020 to 19% in 2021 " 90 days study still ongoing and not finally concluded"	Enrolled members showed 54% decrease in 30 days readmission from 28% yearly rate as of 2020 to 13% in 2021. A study of 171 more patients still going as part of Bupa PACT program to conclude the reduction percentage in readmissions and ED visits over 24 months.

Display 2. Categorization of Program Components

Provider / Activity		IDMC Hospital	Dr. MFH	CCC Hopsital
Pre-discharge or extended activities	Patient assessment and risk stratification	●	●	●
	Patient coaching	●	●	●
	Planning discharge*	●	●	●
	Reviewing and reconciling medications	●	●	●
	Palliative services if needed.		●	●
	Appointment scheduled before discharge	●	●	Differs from one to another
Post-discharge activities	Scheduled communication with promary care provider	●	●	●
	Scheduled Clinics' follow up	●	●	Practice-specific
	Follow up outbound call	●	●	●
	Hotline post discharge support		●	
	Home visit service **	●	●	●
Bridging activities	Transition coach or services	Coordinated care for high risk comorbid patients	Specialized nurse for Heart failure risky patients	Specialized transitional care practitioner
	Patient-centered discharge instructions***	●	●	Hospital-specific
	Provider continuity plan	Primary care-based care coordinators for high-risk patients		Case manager dedicated to each PACT member
	Access to post acute care	●	●	●
	Access to continuity oc care	●		●
	Electronic alerts and E-messaging	●	●	●

The framework adopted from Hansen L.O, Young R.S., Hinami K., et al. "interventions to reduce 30 days readmission (rehospitalization)".

* Discharge planning interpreted as planning for post-discharge needs.
** Home visit interpreted as transferred to home care service.
*** Patients' focused discharge tailored information fitting health status such as medications and follow up plans.

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Tables:
Study results and outcomes:

Table 3. Transitional gaps discovered at discharge:

Profile of Patients (N=51)		N (%)	
Medication reconciliation		20 (%)	
Poor Health education		21 (%)	
Missing essential equipments		15 (%)	
Missing referral to Physiotherapy , Lab. , Dressing ,..		13 (%)	
Missing a prescriped medication/s		5 (%)	
Missing one or more comorbidity		4 (%)	
patients without gaps		6 (%)	

Table 4. Actions based on PACT 1st engagement at 3-7 days :

Profile of Patients (N=51)		N (%)	
Educated to measure blood pressure/sugar		34 (2%)	
Medications' Coaching		16 (4%)	
Requested further investigations		15 (4%)	
Refilled blood pressure machine		11 (88%)	
Refilled Glucometer machine		4 (%)	
Dietition visits request		9 (2%)	
Physiotherapy referral		6 (%)	
Surgical dressing done		4 (%)	
IV Antibiotics given		1 (%)	
New Medications precribed		6 (%)	
Medications' dose modification		3 (%)	

Table 5. Follow up 2nd engagement at 30 days :

Profile of Patients (N=51)		N (%)	
Fully compliant with medications		13 (2%)	
Controlled Blood Pressure		13 (2%)	
Controlled Blood Sugar		10 (2%)	
On special Diet		8 (8%)	
Still with High Blood Pressure		1 (2%)	
Still with High Blood Sugar		2 (4%)	
Urgent Outpatient referral		5 (2%)	
Re-admission		1 (2%)	

Table 6: Cost avoidance results after controlling re-hospitalization*

Sum of PACT Saving	Column Labels	
PACT Saving per diagnosis	DSFH	IMC
Avoid regular admission	SAR 385,000.00	SAR 65,000.00
CHF	SAR 60,000.00	SAR 30,000.00
	SAR 20,000.00	
Electrolyte disturbance	SAR 20,000.00	SAR 20,000.00
DM, Chronic Wounds	SAR 40,000.00	
Pyelonephritis	SAR 35,000.00	
Anemia	SAR 15,000.00	SAR 15,000.00
Ischemic heart disease	SAR 20,000.00	
Pneumonia	SAR 20,000.00	
Peripheral Vascular disease	SAR 20,000.00	
Pneumonia, CVA	SAR 20,000.00	
CVA, Chronic Wounds, Electrolyte disturbance	SAR 20,000.00	
CVA, Chronic Wounds	SAR 20,000.00	
TKR, Electrolyte disturbance	SAR 20,000.00	
Asthma Excerbation	SAR 20,000.00	
Fracture Femur	SAR 20,000.00	
Anemia, CVA	SAR 15,000.00	
Avoid regular admission, Avoiding ICU admission	SAR 50,000.00	
CHF	SAR 50,000.00	
Avoiding ICU admission	SAR 220,000.00	SAR 40,000.00
DM, Chronic Wounds	SAR 50,000.00	
Chronic Wounds, DM	SAR 50,000.00	
Pyelonephritis	SAR 40,000.00	
Ischemic heart disease, Chronic Wounds	SAR 40,000.00	
CHF	SAR 40,000.00	
Chronic Wounds, Anemia		SAR 40,000.00
Avoiding Life Threatening condition	SAR 190,000.00	SAR 50,000.00
Post Major surgery	SAR 40,000.00	SAR 50,000.00
Chronic kidney disease with metabolic acidosis, Electrolyte disturbance	SAR 50,000.00	
CHF	SAR 50,000.00	
CHF, Electrolyte disturbance	SAR 50,000.00	
Early referral to the hospital	SAR 20,000.00	
CVA, Electrolyte disturbance	SAR 20,000.00	
Grand Total	SAR 865,000.00	SAR 155,000.00

*CCC has small sample, which has been included with Dr. MFH cost avoidance.