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What Are The Crucial Components of Patient Activation Interventions?

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Abstract

Objective: With evidence that patient activation is alterable and can be increased in adults with chronic conditions [1], interventions targeting activation it is growing. However, little is known about what constitutes a patient activation intervention (PAI). Therefore, this integrative review aims to explore the components of PAI in existing literature.

Methods: An integrative review based on updated methodology proposed by Whittemore and Knafl [2], was used to examine the components of PAIs. A literature search was conducted using CINAHL, PubMed, PsycINFO, and PsycARTICLES.

Results: A total of 10 peer-reviewed articles were identified. All articles originated from USA, with seven based in community health services. There are two main types of PAI found in this review. Half of the studies focused specifically on physician-patient relationships, with a narrower definition of activation. The others focused on self-management, facilitating behaviour changes and tailoring interventions according to activation levels.

Conclusion: There are various format and contents in the ten studies, with interventions focusing on physician-patient communication being the most widely replicated format.

Practice Implications: While there are some promising results, more studies are needed to examine components of PAI that works and the long-term effectiveness.

Abbreviations: PAI: Patient Activation Intervention; CCM: Chronic Care Model; PAM: Patient Activation Measure; RQP: Right Question Project; CAD: Coronary Artery Disease; CHF: Chronic Heart Failure; COPD: Congestive Obstructive Pulmonary Disease

Introduction

The burden of chronic diseases is escalating rapidly worldwide. According to the World Health Organization [3], 68% of global deaths in 2012 were due to chronic diseases, contributing significantly to the leading causes of burden of disease. The Chronic Care Model (CCM) [4] is a widely adopted approach to inform chronic diseases practices. Although evidence suggests that such practices generally improve quality of care and outcomes for patients with chronic diseases [5], it has been argued that the lack of effective patient activation strategies has limited the full implementation of this model [6].

Patient activation defined as one having knowledge to manage their condition and maintain functioning and prevent health declines; skills and behavioral repertoire to manage their condition, abilities to collaborate with their health providers, maintain their health functioning, and access appropriate and high-quality care [7], can significantly improve health outcomes in chronic diseases care [1,8,9].

Hibbard and colleagues [7] developed the Patient Activation Measure (PAM) to assess knowledge, skills and confidence in managing health [7,10]. Research demonstrated that higher PAM scores are associated with more satisfaction with services [9], more engagement in care and self-management behaviours [7,9], and improved health outcomes [9,11]. With evidence that patient activation is alterable and can be increased in adults with chronic conditions [1], interventions targeting activation it is growing. However, little is known about what constitutes a patient activation intervention (PAI). Therefore, this integrative review aims to explore the components of PAI in existing literature. The specific objectives are to examine

i.   The intervention format

ii.   Intervention contents

iii. Training for providers/facilitators.

Methods

Search strategy

An integrative review based on updated methodology proposed by Whittemore and Knafl [2], was used to examine the components of PAIs. A literature search was conducted using CINAHL, PubMed, PsycINFO, and Psyc ARTICLES. The specific search terms used were: "patient activation" AND interven(*) or treat(*) in PubMed, (patient N3 activat*) AND interven(*) or treat(*) in the other 3 databases. The search resulted in 581 references. Of these 139 were duplicates, reducing the total to 442 articles. Given the research aims to be examined in this integrative review, specific inclusion criteria were used to ensure the inclusion and review of all relevant intervention studies.

Studies included met the following criteria:

i. Implementation of a non-pharmacological intervention to improve patient activation (as stated by the authors)

ii. Measure of patient activation

iii. Written reports in English. Studies were excluded if the focus of intervention was not stated to be patient activation, or if the focus was on relationships with patient activation or measurement of patient activation evaluation. 10 peer-reviewed studies met the criteria and were included in this review.

Search outcome

A total of 10 peer-reviewed articles were identified. All articles originated from USA, with seven based in community health services. Two authors (Alegria and Deen) had two articles each included in this review. Alegria and colleagues reported on a pilot version in 2008 and a refined version in 2014. Deen and colleagues reported on the same intervention used in different study design in both the 2011 and 2012 paper. This same intervention was also adopted in the paper by Maranda, et al. [12]. It was of interest to note that all the above mentioned interventions originated from the Right Question Project (RQP). All the other interventions were independent studies.

Quality appraisal

All papers were published in peer-reviewed journals. Due to the small number of articles found in this review, none were excluded. The articles were reviewed for quality of evidence as defined by Melnyk & Fineout-Overholt [13]. The level of evidence, study limitations and biases were presented in (Table 1).

Data abstraction

Articles meeting the criteria for inclusion were organized in subgroups by the type of intervention focus to facilitate comparison of design across similar interventions. Sources were described based on the following data elements that were extracted: author/year, purpose and design, sample and method (Table 1). Theory was excluded from the table as none of the studies stated any theory explicitly. Findings of the components of PAI in the areas of setting, delivery mode, dose/duration, format, contents, and training for providers/facilitators were displayed in (Table 2). These are crucial components that clinicians have to consider when designing an intervention, thus identifying these elements allow comparison and critique of the studies, noting findings relevant to a PAI.

Table 1: Design of included studies.

Author/ year/country	Design and purpose	Sample	Method	Level of evidence/ Biases
Interventions focusing on patient-physicians interactions				
Alegria, Carson et al. [27]	Mutlisite randomised clinical trial to determine whether the DECIDE (Decide the problem; Explore the questions; Closed or open-ended questions; Identify the who, why, or how of the problem; Direct questions to your health care professional; Enjoy a shared solution) intervention, an education strategy that teaches patients to ask questions and make collaborative decisions with their healthcare professional, improves patient activation and self-management, as well as engagement and retention in behavioural health care. Three DECIDE training sessions delivered by a care manager vs. giving patients a brochure on management of behavioural health.	Inclusion criteria: 1. 18 to 70 years 2. English or Spanish speaking 3. Enrolment in mental health care programs Exclusion criteria: 1. Lacked capacity to consent 2. Disclosed recent suicidal behaviour or ideation 647 English or Spanish speaking patients from 13 outpatient community mental health clinics across 5 states and 1 US territory were recruited. Intervention and control patients were comparable at baseline on demographics, diagnostic and outcome measures. Around 70% of participants were female, with majority being Latino (~66%).	Measures were administrated at baseline and follow-up assessment at approximately 45 and 105 days. Primary outcomes: Patient Activation Scale, Perceived Efficacy in Patient-Physician Interactions) Secondary outcomes: patient engagement (proportion of visits attended of those scheduled) and retention (attending at least 4 visits in the 6 months after the baseline research assessment), collected through medical record review or electronic records.	Level II 1. Referral bias 2. Attention bias (Control group had less contact time with care manager) 3. Contamination within same site bias 4. Different care managers bias

Alegria, Polo et al. [20]	Pre/post test comparison group design to evaluate a patient self-reported activation and empowerment strategy in mental health care.	Inclusion criteria not stated. Exclusion criteria: 1.　　Younger than 18 or than 65 2.　　In crisis or actively psychotic 3.　　With significant comprehension difficulties 231 patients from 2 community mental health clinics that serve primarily Latino and other minority patients. Intervention site's patients are primarily Spanish speaking (83%); Medicaid recipients or uninsured (65%); and have mood disorders (67%). Comparison site's patients have 45% who are Spanish speaking, but most are on Medicaid or uninsured (62%), and with mood disorder (45%). Sample at both clinics were predominately female, foreign-born and unemployed. There were no significant differences across the sites in age distribution, education level or referral source. However, ethnic distributions varied significantly, as did language of interview and length of time in care before enrolment.	The Right Question Project-Mental Health (RQP-MH) trainings consisted of 3 individual sessions to teach participants identification of questions that would help them consider their role, process and reason behind a decision, and empowerment strategies to better manage their care. Four main outcomes were measured: patient activation using modified Patient Activation Scale; changes in self-reported patient empowerment; treatment attendance; and retention in treatment.	Level III 1. Volunteer/ referral bias 2. Attention bias (control group only receive usual care) 3. Different care managers bias 4.　　Nil randomisation of groups, with each group at different sites.
Deen, Lu & Rothstein et al. [29]	Pre-post evaluation of a patient activation intervention focused on building question formulation skills that was delivered to patients in community health centers prior to their physician visit.	Inclusion criteria not stated. 255 participants had a mean age of 39 years and were predominately Latino or African American (90.1%). 83.3% were female. Half of the participants reported a medical condition for which they saw their doctor on a regular basis.	The intervention aimed to build patients' skills to ask more and better questions of their doctors and to recognise the importance of asking questions in the decision making process. Intervention impact was evaluated based on Patient Activation Measure scores, and explore the influence of individuals' preferred role in decision making using Patients' preference for control (PCC Scale).	Level IV 1.　　No control group thus enable to determine results due to effects of intervention 2.　　Do not know about sustainability of results as no long term follow-up 3. Volunteer bias 4. Different therapists bias

Deen, Lu & Weintraub et al. [28]	Randomised controlled trial with 4 groups design: no intervention (control – data collection and doctor visit), pre-visit exposure to a patient activation intervention (PAI), pre-visit exposure to decision aid (DA), and pre-visit exposure to both DA and PAI.	No inclusion criteria stated. Patients aged 18 and older attending the William F.Ryan Health Center in New York City were approached. 279 study participants had a mean age of 44 years and 62.9% were female. Differences in distribution of ethnic groups were not statistically significant. No significant difference in education was found between groups.	Pre and post-visit data were collected in the waiting room prior to and following a physician visit. Measures used include the short form Patient Activation Measure (PAM) and the decision self-efficacy (DSE) measure.	Level II 1. Study's sample sizes were underpowered 2. Gender and race were not even distributed 3. ¾ of participants were at PAM stages 3 and 4 which were not the target population (PAM stages 1 and 2) of the intervention. No long-term follow up
Maranda et al. [12]	A convergent parallel mixed methods design consisting of a randomised 2 group (PAI or control group – no exposure to PAI) and qualitative open-ended questions to identify participants' perceptions of the intervention. The hypothesis that the PAI has a positive effect on patients' activation as measure by the PAM and Decision Self-Efficacy Scale (DSE) for those patients who prefer to use Spanish was tested.	No inclusion criteria stated, except for Spanish speaking. A convenience sample of Spanish speaking aged 18 and older attending a Community Health Center (CHC) in New York City was obtained over a 10-month period. 132 participants' mean age was 56 years and not significant different between intervention and control groups. More than ¾ of the participants in both groups were women. 52.3% has less than a high school education; difference between the 2 groups was not statistically significant.	The PAI objective is to help patients identify medical decisions and the questions that inform those decisions, and then use that information to prepare questions for their impending doctor visit. Quantitative data was collected using PAM and DSE. Qualitative data was collected using semi-structured follow-up interviews after the patient's health care visit.	Level II 1. Single site thus decrease generalizability 2. Volunteer bias: baseline lower PAM scores patients under-sampled. 3. Differences in educational attainment between control and intervention groups.
Interventions focusing on self-management				
Bartels et al. [15]	Pre-post pilot study evaluating the feasibility and potential effectiveness of the CAT-PC program. The aim of CAT-PC is to better prepare persons with serious mental illness and co-morbid health conditions for their primary care encounters by identifying specific personal health goals, improving health care communication skills, and engaging them as activated participants in shared goal setting and decision making.	17 patients with serious mental illness (DSM-IV diagnosis of schizophrenia spectrum disorder, bipolar disorder or major depression associated with a functional impairment of at least 12 months or longer), aged 50 and older with cardiovascular risk factors (one or more of the following: heart disease, diabetes, impaired fasting glucose, hypertension, hyperlidemia, current smoker, or overweight/obese (diagnosis of BMI > 25), from the community mental health center, who were also seen for medical care by a primary care provider. Nearly equally split between males and females, 100% White.	Treatment effectiveness assessed by pre and post test measures. Self-report measures: Patient Activation Measure, short-form Perceived Efficacy in Patient-Physician Intervention Scale (PEPPI), Autonomy Preference Index (API). Performance-based assessment: Social Skills Performance Assessment (SSPA) Participant experiences and satisfaction questionnaire.	Level IV 1. Small sample size 2. Lack of comparison group 3. Convenience sample: lack of generalizability 1q

Frosch [22]	Two group quasi-experimental study to evaluate the effect of an activation intervention delivered in community senior centers to improve health outcomes for chronic disease that disproportionately affect older adults.	Inclusion criteria: 1. 55 and older 2.　　Able to ambulate on their own 3.　　Able to complete questionnaires without assistance 4.　　Able to read and write English 116 older adults from two community senior centers in greater Los Angeles. Participants in encouragement condition (Center 1) were somewhat younger (mean 70.6 compared to 73.6), more likely to be African American (93.7% compared to 19.6%), had fewer years of education (50% > High school education compared to 92.5%) and reported lower household incomes (63.6% < $35,000 vs. 46%).	Set of five video programs developed by the Foundation for Informed Medical Decision Making. Moderated discussion with participants after viewing videos. Participants completed study measures at baseline, after the 12-week intervention period, and 6 months after enrolling in the study. Study measures: Patient Activation Measure, Medical Outcomes Study 12-item Short-Form Survey (SF-36) measure of health related quality of life and physical activity measure.	Level III 1. Intervention site bias: participants not randomised 2. Volunteer bias 3. Sample size not adequately powered 4. Small representation of total population: not clear if representative
Hibbard [6]	Quasi-experimental pre-post design to determine whether an approach that assesses patient capabilities for self-management and then tailors coaching support based on this assessment would be more effective in improving outcomes than the usual disease management approach.	Inclusion criteria not stated. Intervention group (n=4254) consisting of coaches and their patients based in 1 call center. Control group (n=2574) consisting of coaches and patients based in a differently geographically separate call center. Coaches serving control group did not have access to their patients' PAM scores and were not trained in interpreting and using PAM score for coaching. Nurse coaches' tenure and years of experience similar. There are no significant differences between the groups in age or whether they screened positive for depression. There are differences in the distributions of primary diagnosis. Those in control group had 2 more months of coaching, more participants whose conditions had a high severity rating and on average slightly more comorbidities.	Intervention coaches used baseline PAM scores to segment patients into 4 levels of activation and customise telephone coaching based on activation level. Pre-intervention (1 year before implementation) and post intervention (6 months after) Utilisation variables: office visits, ED visits, and hospital admissions using a count of the events per month Clinical indicators: biometric variables (A1C levels – diabetes; LDL cholesterol – diabetes, coronary heart disease (CAD) or congestive heart failure (CHF); blood pressure – CAD, CHF, diabetes or hypertension) and variables reflecting adherence to medical recommendations. Patient Activation Measure	Level III 1.　　No full data on any of the variables measured 2.　　No randomisation of participants 3. Intervention timing bias: intervention was conducted for a shorter duration than expected due to extended time for coaches to be trained 4. Different coaches bias

Shiverly et al. [16]	A randomised, 2-group, repeated-measures, single-site study design was used. The objective was to determine the efficacy of a PAI compared with usual care on activation, self-management, hospitalisation, and emergency department visits in patients with heart failure.	Inclusion criteria: 1. Documented clinical heart failure (HF) stage C 2. Incident hospitalisation or ED visit for HF within the previous 18 months 3. Aged 18 years or older 4. Live in San Diego county 5. Read and speak English 6. Has telephone access 7. Has a primary care provider for routine medical care Exclusion criteria: 1. Inability to provide written consent 2. Acute medical problems within the previous month 3. Considered by investigators to be medically unstable 84 participants were stratified to usual care (n=41) or usual care plus intervention (n=43). Participants were primarily male (99%), white (77%) and had New York Heart Association III stage (52%). The mean age was 66 years, and 71% reported 3 or more co-morbidities. Participants in the usual care group were significantly older than those in the intervention group (69 vs. 63 years)	The intervention was a 6 month program to increase activation and improve heart failure self-management behaviours. Primary outcomes were patient activation using the PAM, self-management using the Self-Care of Heart Failure Index (SCHFI) and the Medical Outcomes Study (MOS) Specific Adherence Scale and hospitalisations and emergency department visits.	Level II 1. Inadequate sample size: power less than 0.80 for some significant effects 2. Group differences in age 3. Changes in routine clinical practice during intervention 4. Site bias 5. Different therapists bias
Solomon [17]	Randomised controlled trial to explore the effect of a web-based intervention on the patient activation levels of patients with chronic health conditions. Two groups design: Intervention group had access to a patient portal featuring interactive health applications accessible via the Internet. Control group had access to a health education website.	201 participants were selected from the patient panel of a regional health care system in the United States. Patients were between 18 and 64 years, inclusive, with a diagnosis of asthma, hypertension or diabetes, and who had visited a participating physician in the past 2 years but not in at least 180 days. The sample consisted of predominately non-Hispanic white persons between 45 and 64 years of age with a college degree. There were slightly more women than men.	In contrast to the intervention group, the materials available to the control group were non-interactive and not prescriptive. Patient activation was assessed pre and post test using the 13-iteam PAM.	Level II 1. Poor representation in sample: highly educated, mainly white 2. High attrition rate (41%)

Table 2: Components of Patient Activation Interventions.

k	Intervention 1.Setting 2.Dose/ duration 3.Delivery mode 4.Format	Intervention content	Training for provider/ facilitator
Interventions focusing on patient-physician interactions			
Alegria, Carson et al. [27]	1. Outpatient community mental health clinics 2. 3 training sessions within 3 months, 30 – 45minutes in total 3. In person, or rarely, by telephone 4.Individual didactic presentation with opportunities for participation, role-play, and reflection	DECIDE 1. Training 1 (Decisions and Agency) sensitizes patients to their role in clinical interactions and encourages participation in decision making. Patients are taught question formulation ("brainstorming") and receive a planner summarizing the intervention content. 2. Training 2 (Role, Process, and Reason) frames treatment decisions in terms of the roles, processes, and reasons involved. Role-playing and practice assignments reinforce learning. 3. Training 3 (Self-Efficacy and Consolidation) patients identify sources other than health care professionals to answer questions about their behavioural health or treatment. 4. Skills are reinforced and reviewed in a booster session, if necessary.	Background of care managers not stated. 2-day workshop with care managers: 1. Principles of patient activation and self-management 2. Thorough review of the DECIDE intervention using videotaped role-play with mock patients. 3. The care managers received weekly telephone supervision from 2 DECIDE supervisors to support implementation of the intervention and solve problems with difficult trainings.
Alegria, Polo et al. [20]	1. Community mental health clinics 2. 3 training sessions, 30 minutes 3. In person at clinic. Scheduled for second and third training after they attended at least 1 appointment with a provider after the first training 4.Individual i. Hypothetical scenarios presented ii. Elicit discussion about decision-making in care and patient provider interactions. iii. Strategies of cognitive-behavioral mental health interventions, including role plays and homework assignments	RQP-MH (Pilot version of DECIDE) 1. Question Formulation Technique (QTF) 2. Asking patients to generate and revise questions to obtain more informative answers from their providers 3. Framework for Accountable Decision-Making (FADM) Sessions emphasized shared patient-provider decision making (empowerment) and preparation for appointments by formulating questions to get information (activation) about patients' mental illnesses, treatments, and relationships with providers. Teaches to identify questions that will help them consider their role in a decision, reveal the decision-making process and the reasons behind a decision Participants were encouraged to identify an issue or decision related to their care to explore further their provider and to generate potential questions that would better inform them. Incorporated cultural components that could influence minority patients' experiences when taking an active role in care. Reframe patients' questioning or information-seeking not as a lack of respect for providers, but as way to get answers without offending providers' professional abilities. CMs also handled patients' hesitance to probe providers by assuring them that asking questions is a way to understand providers' choices, be helpful to providers, and develop mutual trust.	Two 4-hour workshops for research staff and BA-level care managers (CMs): 1. RQP's fundamental beliefs, principles, and values, and how these relate to an individual's participation in life decisions. 2. Practicing with prompts to illustrate how to generate questions about important decisions and select questions which focus on the individual's role, process, and reason. 3. RQP developers also offered ongoing consultation, meeting approximately once a month with CMs and the CM Supervisor to observe CMs conducting the intervention.

Deen, Lu & Rothstein et al. [29]	1. Community health centers 2. Single session while waiting to see clinicians 3. In person 4. Individual didactic information and practice	Brief Patient Activation Intervention developed in conjunction with collaborators from the Right Question Project (http://rightquestion.org/) 1. Step 1: Understanding decisions. Began by asking patient to describe a decision they had recently made and what questions they considered to help make that decision. Using patient's statements, interviewers clarified definition of a decision: "choosing one option over two or more," and illustrated that the process of decision-making is aided through the generation of questions. 2. Step 2: Choosing a focus for the health care visits. Once patients understood the concepts, interviewers described decisions that are made during physician visits. Patients asked whether they were expecting any decisions to be made at their current visit or if they had any questions for their doctor. 3. Step 3: Brainstorming questions. Interviewers helped patient brainstorm questions that might inform decisions that might be made during the visit. 4. Step 4: Identifying different types of questions. Interviewers led patients through an exercise that defined open versus closed ended questions, asked patients to transform questions from one type to the other, highlighted different types of information gained from each question type. 5. Step 5: Prioritizing questions. Once patient had their list of questions, interviewers asked them to prioritise these questions for their importance to the current visit. Question list given to patient to refer to ask needed during physician visit. Interviewer concluded intervention by reminding participants that asking questions of their medical provider may improve the care they receive.	Not stated.
Deen, Lu & Weintraub et al. [28]	1. Community health centre waiting room 2. Single session while waiting to see clinicians 3. In person 4. ndividual didactic information and practice	Group 1: Activating decision aid (DA) "Getting the Health Care that's Right for you", developed by Foundation for Informed Decision Making (http:// www.informedmedicaldecisions.org/patient_decision_aids.html) Group 2: Patient Activation Intervention (described in above study) and DA Group 3: PAI alone Group 4: routine care	Not stated
Maranda et al. [12]	1. Community Health Center waiting room 2. In person 3. 1 session (10-15 minutes) 4. Individual	Patient Activation Intervention (PAI) as developed by Deen, Lu & Rothstein et al. (2011) described above.	Data collection and administration of intervention was conducted by research assistants with bachelor's degree. They received two weeks of training on conducting the intervention. Details of training were not shared.

Interventions focusing on self-management			
Bartels et al. [15]	1. Primary care clinic or community-based health center 2. Nine, ninety minute sessions, weekly over 2 months 3. Group-based, four to eight participants 4. Interactive educational and experience-based skills training sessions i.Setting goals ii.Making informed choices about healthy lifestyle change iii.Role-play practice sessions for engaging in primary health care encounters	CAT-PC 1. Comprehensive skills training 2. Health care management intervention for older adults with serious mental illness 3.　6 modules: a.　Basics of heart health b.　Personal health assessment c.　Setting achievable lifestyle gaols d.　Making the most of a health care visit e.　Communicating effectively with health care providers f.　Getting help with medical visits from family members	Co-led by a PhD level social worker and two wellness peer specialists who were individuals with serious mental illness with lived experiences making positive health behavior changes and managing cardiovascular risk factors supporting participant self-efficacy, skill development, and knowledge acquisition. Provider training 1. The aim of the training is to improve provider knowledge, patient-centered communication skills, and collaborative goal setting. 2. Prepares primary care providers to be receptive to the new skills that their patients will acquire through the CAT-PC program 3. Provides guidelines for cardiovascular disease prevention and treatment addressing specific pharmacological, behavioral, and communication challenges associated with serious mental illness. 4. Format: i. video details approaches for facilitating the medical encounter for individuals with serious mental illness ii. The training video narrated by a physician who is board certified in internal medicine and psychiatry, and features a patient with serious mental illness who describes the challenge mental illness symptoms present for the medical encounter and shares his personal experiences of improvement in patient activation as a result of the CAT-PC program iii. Handout containing guidelines for evidence-based screening, monitoring, and management of cardiovascular risk. Providers in the first cohort participated in a 45-min in-person training facilitated by a physician researcher. In response to requests to have the physician training easily fit into busy primary care schedules, providers in the second and third cohorts were mailed the training video and handout to view at their convenience.

Frosch [30]	1. Community senior centers 2. 12 week intervention period, each program shown in group screening on multiple occasions on different days and at different times. Single trained facilitator moderated discussion with participants after viewing video program led the group screenings. 3. Group based: Education with motivational tone, using interviews with real patients to illustrate different individuals' ways of increasing self-management of chronic conditions.	1. Goal: ask patients to do things that they could succeed at, thereby allowing them to begin to build confidence in their ability to manage their health. 2. Baseline PAM scores used to segment patients into 4 levels of activation. 3. Behaviours encouraged for each activation level based on empirical data indicating what is realistic at a particular level of activation. 4. Level 1: build patient self-awareness and understanding of behaviour patterns, used as important foundations for tackling further competencies in later steps. 5. Level 2: work with patients to make small changes in their existing behaviours, such as reducing portion sizes at meals. 6. Level 3: adoption of new behaviours and development of problem solving skills 7. Level 4: relapse prevention and handling new or challenging situations as they arise.	Coaches were trained and provided guidelines to customize telephone coaching based on activation level. Background of coaches was not stated.
Shiverly et al. [16]	1. Medical centre or telephone 2. 6 sessions within 6 months intervention 3. Face to face or telephone 4. Individual using goals setting, action plan	Heart PACT intervention 1. First meeting: Patient activation level assessed using PAM and a brief interview. Intervention then tailored according to baseline activation level. i. Level 1: Importance of self-management role. Establish role in self-care. ii. Level 2: Confidence and knowledge. Understanding heart failure (weight, diet, activity), discuss lifestyle behaviours, medication education. iii. Level 3: Skills and behaviours. Set behavioural goals, identify barriers and reinforces, track changes. iv. Level 4: Skills & behaviours under different situations. Identify resources for support, discuss plan for different situations, plan to track progress. 2. Given a self-management toolkit (blood pressure cuff, weight scale, pedometer, heart failure self-management DVD, and educational booklet) at first visit. 3. At each session, individualised health behaviour goals were discussed, progress toward goals reinforced, barriers addressed and questions answer. Tailored program focused on having individualised self-selected goals and moving the patient to a higher level of activation.	Advanced practice nurses. Details of training were not stated.

		My Health Online, a personal health portal featuring a suite of interactive health applications.	
S o l o m o n [17]	1. Web-based 2. 12-week (at least once per week) 3. Individual 4. Self-directed design and 24 hour per day availability.	1. The My Heart Online self-service and health education applications enable patients to manage their health care directly. 2. My Health Online users can book doctors' office appointments online, request prescription renewals, and view and pay their bills. 3. Interactive, multimedia health education modules based on information therapy principles, with each online session designed to advance the user's knowledge by providing evidence-based information on the patient's specific condition, self-management guidelines, and options for problem solving and treatment. 4. Each week, participants received an email alerting them to the availability of the next in a progressive series of health education sessions specific to their chronic condition. 5. Participants who fell below the desired threshold of participation (set at one log-in per week) received a message tailored to this condition, encouraging them to increase their participation and to contact the help desk if they required assistance to use the application. 6. If more information is needed, they can communicate online with their providers using the secure message function of My Health Online. Secure provider-patient email communication helps patients engage in their care and improves their access to information.	Not applicable

Results

The 10 studies represented a total of 8,787 study participants, mainly being older adults. Study sample sizes ranged from 17-6828 participants. Gender was reported in all of the studies; and a slight majority was women (~54%). All studies were done in USA, with eight studies reporting ethnic groups which were mainly White, Latino, African and others. Given the homogeneity of studies from the same country, generalizability of findings based on these demographics characteristics is limited.

Seven of the studies recruited participants from community centres, with the rest being telephone coaching, web-based and medical centre. This may reflect a slant towards community care which looks after healthier adults with milder chronic diseases. This can also be a reflection of evidence showing that patient self-management was particularly effective in community gathering places such as community groups [14]. However, more is needed to balance the uneven service provision and design interventions aiming to engage known hard-to-reach groups.

Three studies targeted participants with mental illness, with one specifically on mental illness and cardiovascular risk due to the elevated burden of cardiovascular risk factors among people with serious mental illness [15]. Shively, Gardetto, & Kodiath et al. [16] focused specifically on chronic heart failure. Four studies did not state the diagnosis while the other two targeted a range of chronic conditions such as asthma, coronary artery disease (CAD), chronic heart failure (CHF), congestive obstructive pulmonary disease (COPD) and diabetes in Hibbard, Greene & Tusler [1] and asthma, diabetes, hypertension in Solomon [17]. It is unclear if there is a need to be disease specific or generic programs as there are both formats presented in this review. Even though Hibbard & Gilburt

[18] reported that activation is an underlying concept of human behaviour and is not disease-specific, chronic disease management research showed a preference for disease-specific programs [19]. This is because successful chronic disease management programs tend to have the ability to enhance chronic disease management self-efficacy, which leads to self-management behaviour change, and develops as a result of programs targeting specific diseases and behaviours [14]. Future research may be needed to investigate if these results in chronic disease management programs apply the same to PAI, thus indicating the effectiveness of disease-specific versus generic programs.

Discussion and Conclusion

Discussion

There are two main types of PAI found in this review. Half of the studies focused specifically on physician-patient relationships, with a narrower definition of activation being "developing experience with question formulation and building information-seeking skills that results in increased collaboration with the health care provider" [20]. Interventions that focused in this area see patient activation as engaging patients in their own care which is a strategy to improve self-management of chronic diseases [21]. One method is for patients to ask questions during physician visits. They are mainly short individual intervention (1-3 sessions) just prior to physician's visits, focusing on facilitating patients to think of appropriate questions to ask physician.

Interestingly, even though physicians are part of the therapeutic relationship, none of the five interventions that focused on physician-patient communication included physicians training.

Only one out of the ten studies in the whole review included physicians in the intervention [15]. In this study, challenges to include a brief in-person training of the physicians were reported, with the main reason being "busy physician schedules". This may reflect physicians' lack of receptiveness in improving their communication as a review on doctor-patient communication reflected that physicians tend to overestimate their abilities in communication [22]. This is despite literature consistently demonstrating physician's communication and interpersonal skills as a central function in building a therapeutic patient-physician relationship which in turn facilitates the delivery of high quality health care [23,24]. Physicians who discourage patients from voicing their needs and concerns can deter patients from asserting their role in health care and may be unable to achieve their health goals [25]. As Fong & Longnecker [22] stated, physicians are not born with excellent communication skills and training has been found to improve physician-patient communication (Harms, Young, Amsler, Zettler, Scheidegger & Kindler, 2004; Bensing & Sluijs, 1985). Therefore, for future interventions in this area, one will have to consider communication training for physicians to truly improve physician-patient communication. There is also limited information on training for providers/ facilitators provided by the authors in this review.

While the current interventions are useful as brief and scalable approaches for practical considerations, they may not be closely align with research on strategies to improve patient engagement and activation. A review by Haywood [26] found that promising approaches consisted of patient coaching, feedback of patient-reported outcome measures and communication skills training for providers. On the other hand, this form of intervention has been the one replicated by three independent research teams over five studies, the most widely replicated format and contents among this review. However, limitations have been recognised by various authors, such as without greater health care professional receptivity to activated patients, contributions to enhance patient activation and self-management may be limited [27] and study design limitations limiting firm conclusions on the effectiveness [28,29]. Future studies will be needed to demonstrate the effectiveness of this brief PAI and to consider the importance of both patients and physicians in promoting patient activation, as well as aligning with research findings on strategies to promote patient engagement and activation.

For the studies focusing on self-management, duration of interventions tend to be longer, ranging from nine weeks to six months. Two of the studies tailored the self-management intervention according to patient's activation level while the rest worked on behavioural changes. For those that tailored interventions to patient's activation level, the theory is similar to graded errorless learning in that patients who are less activated should be encouraged to take suitable small steps where they are likely to experience success. Experiencing success can motivate them to continue to build skills and confidence needed for self-management [18]. These approaches recognised the different needs of patients in different activation levels and thus deliver care

suitable for each level to maximise outcomes (Table 3).

Table 3: Tailoring intervention to patient activation levels.

Level	Activites
Level 1	Focus on building self-awareness and understanding behaviour patterns, and begin to build confidence through small steps.
Level 2	Help patients to continue taking small steps, such as adding a new fruit or vegetable to their diet each week or reducing their portion sizes at two meals a day. Help them build up their basic knowledge.
Level 3	Work with patients to adopt new behaviours and to develop some level of condition-specific knowledge and skills. Support the initiation of new 'full' behaviours (those that are more than just small changes - e.g. 30 minutes of exercise three times a week) and work on the development of problem-solving skills.
Level 4	Focus on preventing a relapse and handling new or challenging situations as they arise. Problem solving and planning for difficult situations to help patients maintain their behaviours.

For the other three studies, they each have their unique format and contents. Frosch [30] intervention assumption was that repeated exposure to the message that active self-management would improve chronic disease outcomes would lead to greater patient activation. However, given that literature has shown education-based interventions to be not sufficient by themselves to prompt behavioural changes and self-management [31], it is likely that vicarious learning and social persuasion in the group setting may have contributed to greater patient activation.

Solomon [17] study is the only web-based format and utilised intervention designed for enhancing self-management to investigate the effects on patient activation. Bartels [15] had an extended form of physician-patient communication intervention focusing on skills training for both patients and physicians, and adding on education and lifestyle goals setting. This intervention appears to be most closely aligned to components and strategies that work in both self-management and patient activation literature, for example, group format, problem solving, skill building and communication training for providers. Although this is only a pilot study, the robust design of the intervention looks to be promising.

Even though chronic disease management literature has suggested the benefits of group-based intervention [14,32,33] only two out of the ten interventions adopted a group-based method. This may be due to resources constraints for the time-limited interventions of those that focused on patient-physician communication. Another consideration could be the emphasis on tailoring interventions to each individual. While the two types of PAI have different focus, the common factors include development of skills and building confidence. This is based on the theory in patient activation literature that many patients are ineffective or do not engage in self-management roles due to a lack of necessary

skills or confidence [18]. As patients' activation increase, they gain a greater sense of self-efficacy and control over their health, and become more empowered to take action [18]. Another common factor is the focus on encouraging individual to make choices and to self-initiate behaviours. This facilitated gaining of problem-solving skills needed in self-management of chronic diseases [34].

Conclusion

There are two main types of "Patient Activation Intervention" that are emerging in the literature. One focused on physician-patient communication while another incorporated patient activation into behavioural changes. There are various format and contents in the ten studies, with interventions focusing on physician-patient communication being the most widely replicated format. While there are some promising results, more studies are needed to examine components of PAI that works and the long-term effectiveness. Some specific areas for future studies can include the following:

i. In other countries other than USA

ii. Interventions for known hard-to-engage groups

iii. Comparing effectiveness between disease-specific and generic PAI

iv. Interventions including training for attending physicians and/or healthcare professionals

v. Group-based PAI

vi. Long term effectiveness of the brief PAI focusing on physician-patient communication.

Practice Implications

Brief PAI focusing on physician-patient relationships, should consider patient coaching, feedback of patient-reported outcome measures and communication skills training for providers. For the studies focusing on self-management, tailoring the self-management intervention according to patient's activation level and facilitating behavioural changes are the common components. However, more studies are needed to investigate components that work.
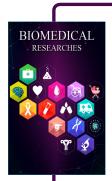
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