Appendix A: Summarization of Health System-Driven Health Literacy Interventions

Author(s) (Reference)	Publication Year	Purpose	Intervention Type	Subjects	Outcomes	Brief Methodology	Results
Kobak et al. [11]	2011	• Evaluate efficacy and user satisfaction of a Web-based version of the Enhancing Interactions Program[1]	• Web-based tutorial and modules	• 23 parents associated with Treatment and Research Institute for Autism Spectrum Disorders at Vanderbilt Kennedy Center (Nashville, TN)	• User satisfaction scores and changes in knowledge about autism concepts	• Web tutorial had three main modules over autism impact on behavior, promoting skill acquisition, and how to improve functional communication skills for the child	• Parents had a significant increase in mean number of correct items ($p < 0.05$) • Tutorial was rated as highly usable and user-friendly
Schweickert et al. [12]	2011	• Evaluate the effectiveness of telehealth education in comparison to the traditional in-person stroke prevention education	• Telehealth video conferencing technology	• 11 elderly rural individuals in Virginia who were at risk for stroke (Appalachian region of Virginia)	• Changes in satisfaction, knowledge, and likelihood of making behavioral changes to reduce vascular risk factors	• In-person group received 20-minute session about symptoms and risk factors of stroke • Telehealth group received same content over video conference • Test scores were used to compare between both groups	• No significant differences between telehealth and in-person groups for all outcomes • Both groups experienced significant knowledge increase post-intervention
Eaton et al. [13]	2012	• Evaluate the effectiveness of online information session in comparison to the traditional in-person information session over bariatric surgery	• Information session in-person or online	• 338 patients receiving bariatric surgery at Johns Hopkins Academic Medical Center (Baltimore, MD)	• Primary outcome: differences between test scores for online and in-person groups	• Both sessions: a presentation about bariatric surgery procedures and its risk and benefits, requirements to enroll in program, and steps to be approved by insurance • Online sessions: They receive quiz but they can view the presentation multiple times • Knowledge assessment score was compared between groups	• Online group had significant better average test score (85.69 versus 80.32) than in-person group ($p < 0.05$)
Kim et al. [14]	2012	• Evaluate impact of uHealth[2] services of patient's knowledge	• Telehealth (remote consultations), telemedicine (remote	• 144 older South Korean patients at a South	• Changes in patient's knowledge, skills, and	• uHealth program had 3 major services	• Significant increase in knowledge about self-management ($p < 0.05$)

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		about COPD, self-management, uHealth device usage skills, and attitude towards device • Compare effectiveness of voice through mobile phones versus video services through video phones	monitoring), and eHealth (mobile phone)	Korean university-affiliated hospital (Seoul, South Korea)	attitudes about uHealth and COPD	• Daily self telemonitoring for COPD symptoms • Teleconsultation to provide knowledge on COPD self-care • Mobile phone (audio) or video phone (video) was used for teleconsultation • Test scores were compared between 3 groups (Group 1 only received uHealth devices; Group 2 received the devices, plus mobile phone; Group 3 received devices, plus video phone)	pre-test and post-test within groups, but differences were statistically insignificant between groups • All groups showed statistically significant differences in using the uHealth devices with an increased confidence ($p < 0.05$)
Leung et al. [15]	2012	• Collect pilot data on health coaching and medication adherence in hypertensive patients • Demonstrate feasibility and acceptability of intervention for patients and coaches • Provide example of incorporating student health care into a primary care team for hypertensive patients in a low resource, multicultural clinical setting	• Student health coaches	• 25 hypertensive patients at Rhode Island Free Clinic (Providence, RI)	• Blood pressure, medication adherence, frequency of blood pressure monitoring at home, healthy behavior • Patient satisfaction and feasibility of student coach model	• MD, PharmD, or RN candidates volunteered as health coaches and were trained by multidisciplinary team of healthcare professionals in various topics such as documentation, patient education, patient counseling, and medical care in Spanish • Patients were matched with health coaches; health coaches reviewed various clinical measures such as medication status, barriers to adherence, explaining proper blood pressure monitoring, and encouraging patients to engage in 1 lifestyle goal • Health coaches followed up with 20-minute calls every other week to gather more data and assess progress towards lifestyle goal	• 12 patients completed intervention; only significant increases in medication adherence ($p < 0.05$) and reduction in systolic blood pressure was observed ($p < 0.05$) • Patients reported the intervention had a positive effect on self-efficacy, knowledge, and being motivated to pay more attention their condition

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Banbury et al. [16]	2014	• Examine acceptability of multi-site videoconferencing to provide group education in their homes	• Group education using video conference technology	• Rural northern New South Wales, Australia; My Health Clinic at Home (not-for-profit community care center) telehealth project	• Identify themes related to acceptability of multi-site videoconferences	• People were grouped according to health literacy levels • Time slots were allocated for meetings each week • Aspects of health literacy and chronic disease self-management were issued • Active participation through discussion and shared experiences	• Qualitative analysis shows video conference usage was easy to use • Participants felt connected due to shared experiences over group conferences • Participants valued meeting others and felt confident in reflecting on health problems
Heisler et al. [17]	2014	• Compare effectiveness of iDecide (tailored interactive diabetes medication decision aid) to traditional print consumer booklets	• Interactive diabetes medication decision aid application	• 188 participants affiliated with community health center in Detroit serving a Latino and African American low-income population (Detroit, MI)	• Primary: Changes in knowledge about anti-hyperglycemic medication, patient-reported medication decisional conflict, and satisfaction with anti-hyperglycemic medication information • Secondary: Changes in diabetes distress, self-efficacy, medication adherence, and A1C	• iDecide was developed using community-based participatory research methods • Two groups: traditional content and iDecide both delivered by community health workers (CHW) • Traditional group: CHW delivered informational print booklet with text, graphics, and tables • iDecide group: CHW provided motivational interviewing to encourage action plan development; application provided information tailored to patient-reported data and clinical information • Questionnaire scores were used to compare both groups	• Both groups had significant within-group improvements between baseline and 3 months in all primary outcomes ($p < 0.05$) • Significant improvements in secondary outcomes were observed within all groups besides diabetes distress for the print materials group ($p < 0.05$) • No significant differences between groups for improvements in knowledge or decisional conflict; clarity and helpfulness of information was greater in iDecide than print material
Ma et al. [18]	2014	• Develop and evaluate a culturally and linguistically	• In-person educational session	• 247 participants affiliated with 11 Chinese	• Changes in average mean score on clinical	• CBPR used to develop intervention; 2 members from each CBO trained to become	• 15 out of 21 questions measuring clinical trial knowledge showed

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		appropriate community-based educational intervention to increase knowledge of and intent to participate in cancer clinical trials among underrepresented Chinese Americans		community-based organizations (CBO) • in partnership with Center for Asian Health at Temple University (Philadelphia, PA)	trials knowledge assessment	CHWs on cancer clinical trial information, awareness, and participation • Education session provided information about cancer clinical trials, stages of clinical trials, benefits and risk of participating in a trial, and how to protect oneself • Knowledge assessment was used to compare knowledge increase within group	significant improvements ($p < 0.05$) • A multivariate linear regression model showed education as a significant predictor of clinical trial knowledge (examples of insignificant variables include gender, annual income, year lived in the United States
Magee et al. [19]	2014	• Evaluate survival skills education program on diabetes knowledge, self-reported medication adherence, and endpoint of ED visits plus hospital admissions	• Bedside education at urban teaching hospital in US	• 125 patients with confirmed diabetes condition	• Changes in average mean score on Diabetes Knowledge Survey and medication adherence on Morisky Medication Adherence Scale	• Education content aligned with American Diabetes Association and The Joint Commission suggested key areas such as defining glycemic conditions, how to prevent, recognize, treat these conditions, and managing sick days and hospital visits • Patients viewed content areas about recognizing and managing glycemic conditions on DVD before taking a post-test Diabetes Knowledge Survey • Licensed nurses and trained research assistants supervised the study • Changes in knowledge was assessed within group	• Significant increase in number of correct answers on diabetes knowledge survey after intervention ($p < 0.05$) • Increased odds of participants being highly adherent to medication after intervention was sustained at 3 months • Reduced emergency department and/or hospital admissions after the intervention for uncontrolled diabetes
Sheridan et al.[20]	2014	• Examine the independent effects of the decision aid on patients' knowledge, accuracy of risk perception, decisional conflict,	• Decision aid	• 160 patients at an internal medicine practice (Chapel Hill, NC)	• Changes in patients' knowledge, accuracy of risk perception, decisional conflict, values clarity, patient-provider interactions,	• 2 groups: no decision or decision aid • Decision aid had 3 modules over individualized risk assessment • Knowledge survey was provided to only the group receiving decision aid	• Within decision aid group: knowledge of effective CHD prevention strategies increased ($p < 0.05$) and increase in the accuracy of perceived CHD risk ($p < 0.05$)

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		values clarity, patient-provider interactions, and intentions for CHD risk reduction			and intentions for CHD risk reduction		• Between groups: decision aid group had more CHD prevention discussions with providers and improved perceptions of patient-provider relationships • Decision aid was rated to be easy to use and understand
Chiapponi et al. [21]	2015	• Determined if Students Teaching Patients improves satisfaction and competences of students as well as improving patient participation	• In-person educational session	• 55 patients receiving surgery at the University Hospital in Madgeburg, Germany	• Patient's recollection of information about procedure • Student satisfaction with Student Teaching Patients	• Students interviewed patients at least 1 hour before surgery and they asked questions about the patients' understanding of the procedure and its risks • Students would teach patients if the patients could not recall relevant information	• 100% of patients reported feeling prepared and understood the information, but not all patients were able to recite vital information during the actual interview • Both patients and student doctors were satisfied with the interview and believed it would benefit both parties
Athavale et al. [23]	2016	• Show unique model of health coaching low-income, high-risk postpartum women which has public health significance • Present current case studies of STAR-MAMA stories	• Showcase case studies and its relation to emotional, instrumental, and health literacy support by health coaches	• 86 women with gestational diabetes at key community sites in Sonoma County and San Francisco in partnership with Women, Infants, and Children (WIC) Program	• Showcase case studies and its relation to emotional, instrumental, and health literacy support by health coaches	• Intervention group received telemedicine self-support system on diabetes preventive topics and are matched with a health coach for longitudinal follow-up • Health coach followed up with participant over 20 weeks and offered support on relevant issues based on responses; health coach connected participant to community resources and health providers • Control group received education resource guide about	• 4 case studies were presented of participants who were at high risk for diabetes symptoms • Empirically, health coach connects women with critical resources • Some major themes highlighted by the cases studies are a need for improved resources for child care, goal setting, and action planning to improve physical activity,

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						postpartum care for themselves and baby	and receiving reminders about the importance of screening for blood sugar
Cai and Hu [24]	2016	• Examine effects of family-based self-management educational intervention of self-management in adults with type 2 diabetes	• In-person educational intervention about diabetes self-management	• 57 diabetic patients in Zhonghua Road in Wuhan, China	• Changes in body mass index, waist circumference, A1C levels, plasma lipid profile control • Changes in scores for diabetes knowledge, family support, self-efficacy, diabetes self-care activities, and health-related quality of life	• Type 2 diabetic patients were recruited and brought a family member as part of the study • Intervention group received 7 1-hour sessions over general information of diabetes such as diet, physical exercise, medication management, blood glucose check, and a self-management plan • Various techniques were used to increase self-efficacy such as role modeling, verbal persuasion, and performance accomplishment • A focus of the sessions involved family support, coping skills, and problem solving strategies • Control group received usual care by family physician • Questionnaire answers was used to compare between groups	• Intervention group had statistically significant improvements in A1C, body mass index, and waist circumference levels compared to the control group ($p < 0.05$) • Intervention group had statistically significant improvements in diabetes knowledge, family support, diabetes management self-efficacy, diabetes self-care activates, and both physical and mental health-related qualify of life compared to control group ($p < 0.05$) • Family members in the intervention group had statistically significant improvements in diabetes knowledge and both physical and mental health-related quality of life compared to control group ($p < 0.05$)
Korsbakke Emtekaer Haesum et al. [25]	2016	• Evaluate effect of telehomecare and educational modules on levels of functional health literacy	• Telehomecare and education module	• 116 COPD Danish patients participating in telehomecare with Telecare North Project in	• Differences in functional health literacy score between groups • Potential associations between functional	• Intervention group received a tablet containing information on how to manage COPD with health data being collected and transmitted to healthcare personnel; nurses monitored and	• No significant difference between functional health literacy score of both groups ($p > 0.05$) • Overall model to predict health literacy was

Author(s) (Reference)	Publication Year	Purpose	Intervention Type	Subjects	Outcomes	Brief Methodology	Results
				North Jutland, Denmark	health literacy and demographic characteristics	educated participants on how to use the tablet to measure vital signs • Demographic data was collected through an interview, and health literacy was determined using Danish Test of Functional Health Literacy in Adults	insignificant ($p > 0.05$) but significant associations included age, education, and years in rehab and/or exercise ($p < 0.05$)
Lilholt et al. (24)	2016	• Examine association between COPD patients' use of Telekit and their functional health literacy and the association between their use of Telekit and their specific technological communication skills	• Telehealth system for COPD management	• 60 COPD Danish patients participating in telehomecare with Telecare North Project in North Jutland, Denmark	• Potential associations between usage of telekit and functional health literacy and use of Telekit and specific technological communication skills	• Face-to-face interview conducted to conduct demographic questions • Functional health literacy measured using Danish version of TOFHLA; scores allow participants to be grouped in categories such as inadequate, marginal, and adequate levels • Non-standardized in-house questionnaire to assess usage of Telekit	• Majority of participants expressed the Telekit system was easy to use, gave them a sense of control, and provided greater awareness of COPD symptoms • Majority of participants had adequate levels of health literacy • For this study, functional health literacy score had no statistically significant effect on use of Telekit system in providing users a sense of freedom, security, and control, and greater awareness of COPD systems
Yehle et al. [28]	2016	• Examine the effect of telemonitoring plus education by home healthcare nurses on HRQoL in patients with varying health literacy levels diagnosed with HF	• Telemonitoring and one-on-one education	• 35 participants using telehomecare in partnership with home care services of large Midwestern (Indiana) hospital system	• Changes in health-related quality of life	• Telemonitoring devices were installed in homes of participants which transmitted health data related to heart failure such as body weight and blood pressure • Participants were educated by home care nurses • Survey questionnaire containing demographic questions (S-	• Perceived health-related quality of life increased, but the changes were not statistically significant • No statistical significance relationship existed between health literacy and perceived health-related quality of life

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						TOFHLA), Minnesota Living with Heart Failure Questionnaire (MLHFQ) was issued pre-test, but the MLHFQ was issued against post-test	
Hæsum et al. (28)	2017	• Explore how the use of telehomecare over the span of 10 months affects functional health literacy levels for patients with COPD	• Telehomecare kit to remote monitor condition	• 90 COPD Danish patients participating in TeleCare North Project in North Jutland, Denmark	• Differences in functional health literacy between control and intervention group	• Intervention group received telehomecare kit and transmitted clinical data and vital signs once a week; nurses educated participants on the use of Telekit and about COPD • Control group received usual care • Test scores were used to compare within and between groups	• Between groups: no statistical significance difference existed between intervention and control group at follow-up after 10 months for functional health literacy score ($p > 0.05$) • Within groups: both groups experienced statistically significant increases in functional health literacy from baseline to follow-up ($p < 0.05$) • Educational level and age was found to be significant predictors of functional health literacy at the 10 month follow-up
Kennedy et al. [33]	2017	• Compare telemedicine versus in-person delivery of inflammatory arthritis self-management educational program in terms of improving arthritis self-efficacy and knowledge, coping efficacy, illness	• Educational intervention about inflammatory arthritis via in-person or telemedicine	• 123 Canadian patients in Ontario, Canada affiliated with St. Michael's Hospital	• Primary outcome: differences in self-efficacy between telemedicine and face-to-face group • Secondary outcomes: differences in arthritis knowledge, coping efficacy, illness intrusiveness, and effective consumer	• In-person group: 1 day educational program over self-management of inflammatory arthritis was delivered to participants; content was a presentation, Q&A, case studies, and small group learning which incorporated aspects of patient education and problem solving • Telemedicine group: same as the in-person group but it was remote	• Participants in both groups experienced immediate similar increases in self-efficacy, arthritis knowledge, being an effective consumer

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		intrusiveness, and effective consumer			between telemedicine and face-to-face group		
Sundaresan et al. [36]	2017	• Determine if decision aid reduces decisional conflict regarding participation in a RCT • Evaluate whether decision aid increased knowledge about RCTs and RAVES (Radiotherapy – Adjuvant versus Early Salvage, RCT for prostate cancer), improved attitude towards RAVES, decreased anxiety, improved decisional satisfaction, reduced decisional regret, and recruitment to RAVES	• Decision aid	• 129 patients from oncology centers across Australia and New Zealand	• Primary outcome: differences in decisional conflict between control and intervention groups • Secondary outcome: differences in knowledge and being recruited to the RCT between control and intervention groups	• Intervention group received information sheet about RAVES and decision aid booklet • Control group received information about RAVES and a blank notebook • Questionnaires answers used to compare outcomes between groups	• Over 6 months, decisional conflict was lower in the intervention group compared to control group ($p < 0.05$) • Knowledge about RAVES was significantly higher in intervention group compared to control group ($p < 0.05$) • No statistically significant differences between anxiety levels, attitudes towards RAVES, and decisional regret and satisfaction
Abutaleb et al. [37]	2018	• Determine if delivery of educational messages through a mobile system for irritable bowel disease improves patients' specific disease-specific knowledge	• Educational texts sent over mobile phone	• 219 patients from University of Maryland Baltimore (UMB), University of Pittsburgh Medical Center (UPMC) and Vanderbilt University (VU)	• Changes in disease-specific knowledge of irritable bowel disease between telemedicine interventions and groups receiving standard care	• 3 groups: weekly telemedicine, biweekly telemedicine, and standard care • Educational texts about Crohn's Disease and irritable bowel disease were sent weekly or biweekly dependent on the group; standard care received education at clinic appointments • Demographic and clinical characteristics was assessed	• Between groups: telemedicine groups experienced a non-significant increase in disease-specific knowledge score compared to standard care group ($p > 0.01$) • Patients who had low baseline scores had greater improvements in

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						• Self-efficacy, locus of control, disease knowledge (Crohn's and Colitis Knowledge survey) was assessed at baseline, 6 months, and 12 months	score over the course of the study ($p < 0.01$) • After adjusting for race, site, and baseline knowledge, differences in disease-knowledge score was not statistically significant across groups
Anderson et al. [38]	2018	• Examined feasibility, acceptance, and impact of mHealth intervention among pediatric patients with sickle cell disease	• mHealth application	• 32 patients with sickle cell anemia at Duke University and affiliated medical centers (Durham, NC)	• Changes in adherence rates, disease knowledge, and quality of life	• All participants were presented the intervention which was an application combining in-person education sessions and remote daily monitoring of medication compliance; providers regularly texted supporting and reminding patients of medication adherence • Data collection included measures such as treatment adherence, disease knowledge, pediatric quality of life, demographic questions	• Final completion track was 10 out of 32 participants who met daily needs to tracking medication • Disease knowledge was a significant increase for all participants ($p < 0.05$) • Participants who completed the intervention reported better functioning related to sickle cell disease and lower pain impact than those who did not complete the intervention ($p < 0.05$)
Melholt et al. [42]	2018	• Explore experience of cardiac patients' usage of telerehabilitation tool for recuperation after surgery • How usage of Web portal affected eHealth literacy skills of patients	• Web portal over recovering from surgery and rehabilitation	• 109 cardiac patients at Aalborg University Hospital and North Denmark Regional Hospital in Denmark	• Changes in eHEALS score • Impression of Web portal	• Survey questionnaire related to patient characteristics, use of technology, seeking health information and eHEALS scale was issued pre-test and post-test • After intervention, a survey about their experience with web portal was issued • Web portal was presented to participants who were in the process of rehabilitation; web portal various forms of media to	• Usage of Web portal was deemed easy to access and understand by participants; usage was low with 31/49 patients saying they rarely used it • Majority of patients relied on Google to search for health information • Patients preferred said they felt best by learning through pictures or videos

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						communicate information about cardiac disease its treatment and adverse effect; suggestions for lifestyle changes were presented to the individuals	• eHealth literacy skills did increase after the project; high positive associations of eHealth literacy with frequent usage of computer and higher educational attainment
Ochalek et al. [43]	2018	• Examine the impacts of novel mHealth application for on improving human immunodeficiency virus (HIV) and Hepatitis C (HCV) knowledge among individuals who are waitlisted for opioids agonist maintenance	• mHealth application	• 25 participants who reported opioid abuse activities at University of Vermont and affiliated medical center (Burlington, VT)	• Changes in knowledge about HIV plus HCV	• At baseline, educational intervention was 1 visit, interactive flipbook, and 15-minute video disseminating HIV and HCV information; participants used an interactive iPad app to take knowledge assessment (HIV/AIDS Knowledge Test) which provided corrective feedback and explanations for incorrect answers • Participants completed a visual analog scale evaluating perceived risk of disease knowledge and HIV and HCV risk behaviors • Knowledge assessment was taken again at weeks 4 and 12 of the 12-week intervention	• Significant increase in HIV and HCV from baseline ($p < 0.05$) • Rating on visual analog scale experienced similar significant increase ($p < 0.05$)
Silverman et al. [44]	2018	• Analyze content of community health worker (CHW) visits and illustrate skills CHW can provide both providers and patients with chronic disease	• Navigator with community health worker	• 145 patients from partnership between large public hospital, Veteran Affairs center, and community health clinic in King County, Washington	• Major themes related to CHW home visits to low-income individuals with poorly controlled diabetes	• Two groups: home-based diabetes self-management intervention delivered by CHWs or usual care • CHWs reviewed 6 required education topics over diabetes with patients and could review additional information based on participants' interest, questions	• Major roles for CHW in this RCT were: educating participants about nutrition, self-management, and diabetes; connecting participants to community resources; and assisting participants navigate the healthcare system

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						about SNAP benefits, and action plan for a health goal • Encounter forms summarizing the visit were analyzed for inductive content analysis to find themes	
Böttcher et al. [47]	2019	• Evaluate impact of personalized text message skin cancer prevention education approach on knowledge preventive knowledge and behavioral change compared with an e-learning education program and a control group	• Information delivered through face-to-face and text messaging or video delivery	• 137 patients received standardized sun protection trainings across German cities	• Sun protection knowledge score and sun protection behavior score	• All participants received brief training and skin examination by dermatologist • 3 groups were formed: intervention group 1 who received face-to-face training over sun protection and text message system training, intervention group 2 who watched a 16-minute video over sun protection, and a control group	• Both intervention groups showed short-term increases in knowledge compared to the control group • After a year, only the face-to-face intervention group had significant increase in knowledge compared to the control group • Sun protection behavior score increased in intervention groups, but it was not significant compared to the control group
de Leeuw et al. [48]	2019	• Compare face-to-face information delivery versus no interactive video versus interactive video information delivery	• Information delivered either through video or face-to-face	• 157 patients at the Amsterdam University Medical Centers, VUmc University Amsterdam, The Netherlands.	• Primary outcome: levels of satisfaction • Secondary outcome: knowledge score	• Control group received standard care which involved a face-to-face intervention about prenatal screening and the consequences of a positive or negative test • Intervention group received the same face-to-face intervention and an additional video session over more prenatal screening information (e.g., chromosomal anomalies, screening vs diagnosing, limitations of ultrasounds); video session was either passive w/o interruptions	• No significant differences were found in satisfaction score between groups ($p < 0.05$) • Intervention group experienced significant increase in knowledge score compared to control group ($p < 0.05$)

Author(s) (Reference)	Publication Year	Purpose	Intervention Type	Subjects	Outcomes	Brief Methodology	Results
						or interactive with mandatory questions	
Doll et al. [49]	2019	• Assess the knowledge, attitudes, and preferences of patients with the use of a decision aid over revascularization and coronary artery disease	• Decision aid	• 203 patients at an Academic cardiac catheterization laboratory in Durham, NC	• Outcomes for the pre-post analysis included validated measures of patient knowledge, decision-making preferences, treatment preferences, and decisional conflict • Outcomes for the randomized controlled study was concordance of patient preferences with delivered treatment at 3 months after angiograph	• Decision aid was developed at Duke University Medical Center and included text, images, and videos describing coronary artery disease, treatment options for coronary artery disease (PCI versus CABG versus medical therapy), and the risks and benefits for the various treatment options • Control group received standard care • Intervention group was presented the decision aid and answered the same questionnaire as the control group • Another RCT with the intervention group was conducted where preferences of treatment was shared or not shared with cardiologists integrating preferences if it was medically appropriate	• Patients preferred treatment with percutaneous coronary intervention compared with either medical therapy alone (63% versus 21%) or coronary artery bypass graft surgery (81% versus 7%). • Decision aid was associated with improved performance ($p < 0.01$) and greater interest in shared decision-making • Randomize controlled study demonstrated the feasibility of integrating patient preference information
Masoi and Kibusi [50]	2019	• Assess the effectiveness of an interactive messaging alert system on improving knowledge of obstetric danger signs, improving individual birth preparedness and complication	• Text messaging alert system	• 450 pregnant patients in Dodoma Municipal of Tanzania	• Knowledge on obstetric and newborn danger signs • Knowledge about individual birth preparedness and complications readiness	• Control groups received standard care while intervention group received text messages about general health education over pregnancy danger signs and preparedness for birth	• Significant differences were seen between control and intervention group on knowledge for obstetric and newborn danger signs ($p < 0.05$) • Education was a significant predictor of having high knowledge for danger signs ($p < 0.05$)

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		readiness practices among pregnant women in Dodoma Municipal					• Intervention group had higher levels of preparedness for birth than control group ($p < 0.05$) • Education was significant predictor of being prepared for birth ($p < 0.05$)
Moradi et al. [51]	2019	• Evaluate the effect of using text messages on improving knowledge and preventive behaviors of foot ulcer infection in patients suffering from type 2 diabetes	• Text messages	• 160 type 2 diabetic patients in community health centers of Andimeshk City, Iran	• Knowledge and practice of diabetic foot care • Fasting blood sugar and hemoglobin A1C levels	• All participants received pre-test questionnaire about demographics, knowledge about diabetic foot ulcers, and behaviors for preventing diabetic foot ulcers • Intervention group received text messages about preventive behaviors	• Awareness of the patients related to diabetes foot care in the intervention group after the intervention significantly improved ($p < 0.05$) • Mean scores of preventive behaviors of diabetic foot significantly increased in the intervention group compared to control group ($p < 0.05$)
Pathak et al. [53]	2019	• Test a modified cancer decision aid for rural populations through usability testing • Evaluate revised rural cancer decision aid on the impact of knowledge and decision outcomes within rural population	• Decision aid	• 31 cancer patients from a Simmons Cancer Institute (Springfield, IL)with satellite facilities in nearby cities	• Acceptability and usability of cancer decision aid • Knowledge and perspective of cancer clinical trials	• Usability test was conducted with individuals who reviewed the tool page-by-page, talking out loud about their likes and dislikes of the tool; individuals filled out questionnaires related to acceptability and usability of the decision aid • New individuals were recruited to test out the revised decision aid; participants completed a pre-test and post-test survey which contained questions about decisional conflict, self-efficacy, knowledge about clinical trials,	• Usability testing showed patients were satisfied with the decision aid and the tool had adequate usability • Revised decision aid had additional information about location, transportation, and different cancer types • Increased certainty about decisions and cancer clinical trial knowledge was seen after using the decision aid ($p < 0.05$);

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						and attitudes toward clinical trials	no significant changes in self-efficacy and attitudes toward clinical trials
Banbury et al. [55]	2020	• Create intervention for older people teaching health literacy, chronic disease self-management skills and social support • Evaluate intervention effectiveness for improving health literacy, chronic disease self-management and social support perception	• Telehealth education sessions	• 111 patients with chronic disease at Rural Northern New South Wales Australia; My Health Clinic at Home (not-for-profit community care center) telehealth project	• Health literacy level • Levels of self-management behavior, supports, and attitudes	• Control group was remotely telemonitored • Intervention group participated in needs assessment, providing user input into development of intervention, and then participated in the intervention • Intervention was 6 weeks consisting of education sessions over topics such as active self-management, self-monitoring, communicating with health professionals, evaluating health information, and care planning	• Significant differences were found in 5 questions of Health Literacy Questionnaire within the intervention group after the intervention ($p < 0.05$) • Significant differences were found in 2 questions of the Health Education Impact questionnaire within the intervention group after the intervention ($p < 0.05$) • 4 major themes were found from the interview and focus group analysis: (1) feeling socially supported and engaging in life, (2) health knowledge was gained and/or reinforced, (3) learned from others and developing insight, (4) feeling empowered and confident to engage in self-management
Dwinger et al. [57]	2020	• Evaluate the effectiveness of	• Telephone health coaching	• German patients with chronic	• Quality of life health behaviors	• Control group received no coaching	• Groups were not statistically different

Author(s) (Reference)	Publication Year	Purpose	Intervention Type	Subjects	Outcomes	Brief Methodology	Results
		telephone health coaching on patient-reported outcomes and health behavior for people living with chronic conditions in Germany		conditions who are enrolled with German statutory health insurance KKH	(alcohol consumption, medication adherence, exercise) • Patient activation, health literacy, depression and anxiety levels, and process of behavior change	• Intervention group received coaching conducted by 20 nurses trained in motivational interviewing; examples of covered topics were: being confident to change daily life behavior, shared decision making, and creating goals	regarding quality of life and health behaviors • Intervention group had significant differences between the control group for 6 outcomes: (1) physical activity hours/week ($p < 0.05$), (2) metabolic rate/week ($p < 0.05$), (3) measuring blood pressure ($p < 0.05$), (4) BMI ($p < 0.05$), (5) patient activation ($p < 0.05$), and health literacy ($p < 0.05$)
Knudsen et al. [61]	2019	• Evaluate whether improvements in patient activation and health literacy competencies are similar in tele-rehab and hospital-based cardiac rehabilitation.	• Cardiac rehabilitation through in-person or tele-rehab	• 66 patients with ischemic or heart valve disease at Aarhus University Hospital in Denmark	• Patient activation as measured by Patient Activation Measure • Health literacy as measured by Health Literacy Questionnaire	• Intervention group received cardiac tele-rehab individually through telehealth which included sessions such as physical exercise, dietary coaching, education, and psychosocial support; participants were handed equipment for telehealth monitoring which would be used at home to measure clinical data such as blood pressure, body weight, exercise time • Control group received hospital-based cardiac rehabilitation (usual care) in a group-based setting which included activities such as education over diet and training sessions • Patient activation and health literacy (with emphasis on 3 questions HLQ3[3], HLQ6[4], HLQ9[5] was measured)	• Both groups experienced similar improvements in patient activation, no significant differences were found ($p < 0.05$) • HLQ6 had significant differences between both groups ($p < 0.05$) but there was no significant differences in HLQ3 and HLQ6

Author(s) (Reference)	Publication Year	Purpose	Intervention Type	Subjects	Outcomes	Brief Methodology	Results
Murthy et al. [62]	2020	• Evaluate impact of mMitra, mobile-based voice messaging service, on maternal health knowledge and antenatal care practices for low-income pregnant women in India	• Mobile-based voice messaging service	• 1,515 pregnant patients in Mumbai, India served by maternity home and health posts	• Change in anemia status • Maternal health seeking knowledge, attitudes and practices	• Intervention group received mMITRA which were audio voice messages covering content based on weeks of pregnancy; example of covered topics were nutrition, supplementation, HIV testing, sonography, danger signs, sanitation, and hygiene • Control group received no messages • Researchers collected data at baseline, postpartum, and when the baby turned 1 year old from both groups	• Anemia status could not be assessed due to missing data • Intervention group performed better than the control group on 4 maternal care activities: (1) receiving tetanus toxoid injection ($p < 0.05$), (2) consulting a doctor when bleeding/spotting ($p < 0.05$), (3) saving money for delivery expenses ($p < 0.05$), (4) delivering in the hospital ($p < 0.05$) • The control group did better than intervention group for resting regularly ($p < 0.05$), and having an at-home birth with skilled attendants ($p < 0.05$) • Within both groups, maternal knowledge improved, but there were no significant differences between both groups
Schnitzer et al. [63]	2020	• Evaluate behavioral and educational group intervention for individuals with comorbid serious mental illness and diabetes on patient knowledge, motivation, skills,	• Educational group sessions	• 60 patients with diabetes and comorbid mental illness at a community mental health center near Massachusetts General Hospital (Boston, MA)	• Glycemic control measured by glycated hemoglobin (HbA1c) • BMI, blood pressure, lipids, physical activity, and diabetes knowledge and self-care	• 16 weekly 60-minute group meetings involving interactive education and problem solving were offered to participants; psychologist specialized in health behavior change for people with serious mental illnesses led the meeting; examples of topics covered include basic diabetes disease	• For participants who attended at least 1 session, improvements in Hb1Ac were seen ($p < 0.05$), BMI ($p < 0.05$), diabetes knowledge and self-care ($p < 0.05$)

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		and self-efficacy for managing diabetes.				education, nutrition, exercise, stress management • Meetings also addressed individual barriers to eating healthy (e.g., living in food desert, lack of food storage) and exercise (e.g., living in unsafe neighborhood, paranoia) through group-solving exercises	
Truong et al. [64]	2020	• Build mock patient Web portal displaying results of pharmacogenomics analysis • Assess patient web portal's ability to disseminate test results and information to patients	• Patient portal	• 20 patients who are part of The 1200 Patients Project with the University of Chicago (Chicago, IL)	• Patient knowledge and perception of pharmacogenomics	• Web portal results were based on using traffic light methodology for showing results (green for favorable information, yellow for cautious information, and red for warnings)	• Both groups experienced significant increases in knowledge post-test ($p < 0.05$), but no significant differences were found between groups • Patients reported the Web portal encouraged them to provide test results to providers and/or friends and family, encourage friends to get pharmacogenomics testing
Tutar Güven et al. [65]	2020	• Develop a Web-based epilepsy education program (WEEP) for youth with epilepsy and their parents, then test its contents, quality, and usability • Assess the knowledge, seizure self-efficacy, attitude, and eHealth literacy of youth with epilepsy and	• Web-based educational program	• 31 youth patients with epilepsy at Pediatric Neurology Department of a tertiary care hospital in Turkey (Antalya, Turkey)	• Children: epilepsy knowledge, self-efficacy, attitudes toward illness, eHealth literacy • Parents: epilepsy knowledge, anxiety, self-management, eHealth literacy	• Website content was developed using information from trusted websites and was evaluated for its quality and usability by experts and participants • Intervention group received access to the website over the span of 12 weeks and received weekly reminders to use the website • Control group received usual care • Children were issued questionnaires containing	• Website was deemed to have high quality and high usability • Mean knowledge, seizure self-efficacy, attitude, and eHealth literacy scores of youth with epilepsy in the intervention group had significantly increased after the WEEP ($p < 0.05$) • Parents in the intervention group had increases in knowledge,

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		their parents to evaluate the efficacy of the WEEP				Epilepsy Knowledge Test, Seizure Self-Efficacy for Children, Child Attitude Toward Illness Scale, eHEALS • Parents were issued questionnaires containing Epilepsy Knowledge Test, Parental Anxiety for Scales, Pediatric Epilepsy Medication Self-Management Questionnaire	anxiety, self-management, and eHealth literacy ($p < 0.05$) • Youth in the control group had significant decreases in mean knowledge, and seizure self-efficacy ($p < 0.05$) • Parents had significant changes in mean knowledge and anxiety ($p < 0.05$)
Williams et al. [66]	2020	• Assess the feasibility, acceptability and cost efficiency of using webinars to deliver first-line advice to patients with suspected or newly diagnosed IBS	• Educational webinars	• IBS patients from health systems around the United Kingdom in partnership with National Health Services	• Levels of knowledge, confidence, acceptability, and usage of healthcare services	• Webinar was developed using 2016 British Dietetic Association evidence-based practice guidelines for the dietary management of IBS in adults • Healthcare providers working with newly diagnose IBS patients distributed webinar links to them; webinar was also distributed through business cards and at talks	• 1,171 attendants completed pre-webinar survey and 443 attendants post-webinar survey • After viewing webinar, patients reported having more confidence in managing IBS ($p < 0.05$) and reported higher knowledge post-webinar ($p < 0.05$) • Patients correctly answered specialist dietitian would be appropriate healthcare provider to consult regarding IBS ($p < 0.05$) • Webinar introduction reduced number of dietician specialist referrals, saving clinical time and money
Chenneville et al. [68]	2021	• Examine the impact of the Bijou program on health-related	• Self-paced Web educational module	• 29 HIV-positive patients receiving	• Knowledge, intervention acceptability,	• Bijou has 6 electronic self-paced modules about HIV-positive health; examples of topics	• Significant increases in HIV health literacy, general health and

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		outcomes for YMSM living with HIV in a pilot study		services at an adolescent infectious disease clinic serving predominantly Black and African American, non-Hispanic young men (South Florida)	satisfaction, self-efficacy, eHealth literacy, and usability	include HIV health literacy, general health and wellness, personal growth, and problem solving • Bijou was presented to all participants who completed pre-test, post-test and a 3-month follow-up survey • Survey had questions related to Bijou-related knowledge assessments, eHealth literacy, usability of Bijou, and self-efficacy	wellness, personal growth, and managing HIV ($p < 0.05$) • Self-efficacy changes were not significant • Bijou was considered to be a usable and acceptable program despite participants not finishing it
Sanders et al. [74]	2021	• Evaluate effects of peer-led intervention on health literacy, eHealth skills and numeracy among people HIV-positive	• Peer-led educational group sessions	• 359 HIV-positive patients from 4 Federally Qualified Health Centers (FQHCs), 4 hospital ambulatory care sites in the New York City metropolitan area, and Rochester, NY	• Patient activation • Health literacy, eHealth literacy, numeracy	• Control group received usual care • Intervention group were able to attend 6 weekly, in-person 60-minute sessions which were led by co-peers (patients with HIV who were trained by researchers); sessions addressed topics such as the basic information of HIV, using a personal health record, how to use the internet to find health information, and engaging with medical providers	• Intervention group had statistically significant improvements in eHealth literacy and HIV knowledge compared to the control group. • Intervention had the greatest impact on participants with the lowest levels of eHealth literacy at baseline. • No statistically significant changes were observed in general health literacy or numeracy in either group

[1] Enhancing Interactions: clinician-led program coaching parents to learn techniques dealing with challenging behaviors and skill development associated with autism
[2] uHealth encompasses telehealth, eHealth, telemedicine
[3,4,5] HLQ3: “actively manage my health”; HLQ6: “ability to engage with healthcare providers”; HLQ9: “understanding health information”