

The University of San Francisco

USF Scholarship: a digital repository @ Gleeson Library | Geschke Center

DNP Qualifying Manuscripts

School of Nursing and Health Professions

Spring 5-26-2020

The Significance of Bridging the Health Literacy Gap

Ella Bermudez
esbermudez@usfca.edu

Follow this and additional works at: https://repository.usfca.edu/dnp_qualifying



Part of the [Nursing Commons](#)

Recommended Citation

Bermudez, Ella, "The Significance of Bridging the Health Literacy Gap" (2020). *DNP Qualifying Manuscripts*. 44.

https://repository.usfca.edu/dnp_qualifying/44

This Manuscript is brought to you for free and open access by the School of Nursing and Health Professions at USF Scholarship: a digital repository @ Gleeson Library | Geschke Center. It has been accepted for inclusion in DNP Qualifying Manuscripts by an authorized administrator of USF Scholarship: a digital repository @ Gleeson Library | Geschke Center. For more information, please contact repository@usfca.edu.

The Significance of Bridging the Health Literacy Gap

Ella S. Bermudez

University of San Francisco

N749 Qualifying Project

Committee Chair:

Dr. Jo Loomis, DNP, FNP-C, CHSE, CLC, ANLC, NCMP, CNL

Committee Member:

Dr. Elena Capella, EDD, MSN/MPA, RN, CNL, CPHQ, LNCC

BRIDGING HEALTH LITERACY

The Significance of Bridging the Health Literacy Gap**Abstract**

Objective: In the veteran population, almost one in every five patients has inadequate or marginal health literacy (Haun, Patel, French, Campbell, & Lapcevic, 2015). Having low health literacy predisposes patients to high emergency room (ER) utilization and hospital readmission (Mitchell, Sadikova, Jack, & Paasche-Orlow, 2012) and low treatment adherence (Miller, 2016). This manuscript aims to review the literature about health literacy and to encourage effective, standardized health education delivery to increase health literacy.

Method: An integrated review of the literature from Cochrane, Joanna Briggs Institute (JBI), Scopus, CINAHL, and PubMed databases showed the importance of bridging the health literacy gap.

Result: The integrated review of the literature provides evidence that timely and applicable health education increases health literacy and promotes improvement in patient engagement.

Conclusion: Adapting effective health education delivery to increase health literacy improves patient engagement and shared decision-making, self-management skills, adherence to treatment plans and quality of life.

Practice Implication: The emergence of new information technologies creates new opportunities and challenges for a settings approach to health promotion. It is by increasing health literacy, improving patient engagement, and reducing healthcare cost that a healthcare service system can pave the way for the achievement of enhanced sustainability.

Keywords: health education, health literacy, patient engagement, veteran, health education delivery, health literacy, health outcome, patient engagement

BRIDGING HEALTH LITERACY

The Significance of Bridging the Health Literacy Gap

Introduction

In 2016, there were about 1.3 million active-duty members in the United States Army, Navy, Air Force, and Marine Corps or Coast Guard (US Department of Defense, n.d.). Ultimately, these service members will transition to join the nine million veterans utilizing their healthcare benefits from one of the 1,243 Veterans Administration (VA) health care facilities, including 170 VA Medical Centers and 1,063 outpatient sites (Veterans Health Administration, n.d.). Like many large health systems, the VA healthcare system exhibits variations in practice among facilities, clinics, and healthcare providers because of diverse expertise and practice styles among clinicians, different clinic organizations, leadership and resources, and influences in community and regional factors (Atkins, Kilbourne, & Shulkin, 2017). This provider-specific approach is contingent on individual providers' expertise, practice location, and time with the healthcare organization impacts healthcare delivery (Spangler et al., 2009). The healthcare planning for the VA is equally complicated because of the possibility that veterans might have more than one possible source of healthcare coverage (Eibner et al., 2016). Like many non-VA users with multiple conditions, veterans often actively seek various prescribers of medications for their chronic diseases to maximize access and convenience and, more importantly, to minimize cost (Voils, Sleath, & Maciejewski, 2014). Veteran patients with multiple chronic conditions account for a disproportionate share of VA healthcare expenditures (Yoon, Zulman, Scott, & Maciejewski, 2014). In fact, 72% of the veteran population with one or more of the 29 common conditions consumed 96% of the VA health care utilization costs in 1999 (Yu et al., 2003).

BRIDGING HEALTH LITERACY

The Role of Health Literacy

Among the veteran population, one in every five veterans is considered to have inadequate or marginal health literacy (Haun et al., 2015). The Agency for Healthcare Research and Quality's (AHRQ) defines health literacy as: "*when health information and services designed for the public match people's capacity to find, understand and use them*" (AHRQ, n.d.). Health literacy is best applied when a patient can understand the health information and comprehend the consequences presented in order to make an informed healthcare decision. High educational literacy is not necessarily a prediction of proficient health literacy (Clark, 2011); though, health literacy mediates the association between educational attainment and health behavior (Friis, Lasgaard, Rolands, Osborne & Maindal, 2016).

Having low health literacy predisposes patients to higher ER utilization and hospital readmission (Mitchell, Sadikova, Jack, & Paasche-Orlow, 2012) and places them at risk for low treatment adherence (Miller, 2016). Low health literacy is significantly related to a higher rate of 30-day post-discharge hospital utilization (Mitchell et al., 2012; Creber et al., 2019; Cox et al., 2017), inadequate caregiver support (Boyle et al., 2017), poorer health knowledge and inadequate self-care behavior (Matshuok et al., 2016), age (Sand-Jecklin, Daniels, & Lucke-Wold, 2017), becoming less involved in health care process (Liang, Wang, Hwang, Lin, & Pan, 2013), downgrading or understating the patients' symptoms and illness (Ahmad et al., 2016), impair a patient's interactions with health professionals which can inhibit the potential to benefit from needed health services (Easton, Entwistle, & Williams, 2013), inhibit patients from having adequate skills to perform appropriate self-care needs (Jacobs, Lou, Ownby, & Caballero, 2016),

BRIDGING HEALTH LITERACY

and pay little attention to their health status; hence, their unhealthy behavior habits continues (Zheng, Jin, Shi, Duan, Wang, Yu, & Li, 2018).

These findings were not unexpected because patients with low health literacy (HL) had inadequate knowledge and inadequate self-care behavior than those with high HL (Matshuoka et al., 2016). For example, patients with heart failure (HF) commonly believed that their hospitalizations were caused mainly by lack of knowledge and treatment noncompliance due to socioeconomic challenges, lack of health care resources, low health literacy and psychological comorbidities (Gilotra et al., 2017). In a similar study, nurses were found to be uncomfortable with HF teaching regarding medications, low sodium diet, activity, and exercise (Albert et al., 2015). Hospital readmissions increased patient burden as well because patients' physical condition deteriorates with every episode of exacerbation or persistence of their illness as in the case of patients with heart failure (Anderson, 2014). Therefore, discharge planning and predischage education are imperative because low quality of discharge teaching decreases patients' readiness for hospital discharge (Nurhayati, Songwathana, & Vachprasit, 2018) and is associated with both early and late readmissions (Greco et al., 2015).

Standardization of Patient Education Materials

Aside from the variation of health care practice commonly observed in an extensive healthcare system (Atkins, Kilbourne, & Shulkin, 2017), the provider's lack of knowledge and skills and inability to answer different patients' needs were consistent barriers to patient engagement (Liang et al., 2018). With this in mind, the frontline staff should be armed with an effective teaching tool to help improve the patient's perception of their healthcare needs which includes how to manage the care demands at home.

BRIDGING HEALTH LITERACY

Standardizing patient education content can enhance health literacy and better patient engagement (Jacobs et al, 2016; Watters, Bergstrom, & Sandefer, 2016). Coordinating the standardized education information across all levels of care and educational encounters supports the most influential theory of social-ecological approach called the convergence strategy or reciprocal interdependence (McCormack, Thomas, Lewis, & Rudd, 2017). The convergence strategy indicates that the best method to be the best-informed healthcare consumer is by reinforcing or repeating the information from the different levels of influence.

All things considered, if poor health literacy is not addressed promptly, the medical expenditures per veteran will continue at 65% higher for VA users than non-VA users (Machlin & Muhuri, 2018). It would cost \$143 million more than it would with adequate health literacy (Haun et al., 2015), partly because of high ER utilization and hospital readmission (Mitchell et al., 2012).

Materials and Methods

The Integrated Review of Evidence

An integrated review of the literature was performed using Cochrane, Joanna Briggs Institute (JBI), Scopus, CINAHL, and PubMed databases to examine the gap in practice. The following key terms were included in the search: *patient education, health literacy, health education delivery, health outcome, and patient engagement*. To obtain the most current review of the evidence, the search was limited to systematic review or meta-analysis, clinical practice guidelines, critically appraised research studies, individual research studies, and peer-reviewed journal articles published between 2015 and 2019 and written in English. The search resulted in 768 articles. Studies on pediatrics, children, neonatal, and newborn populations were excluded

BRIDGING HEALTH LITERACY

from this review of literature. This undertaking resulted in 18 articles after the duplicates and the undefined articles were removed.

Results:

Improved engagement and shared decision-making

Improving patient's health information-seeking self-efficiency and health literacy has the potential to impact healthcare engagement and shared decision-making (SDM) (Wigfall & Tanner, 2018). Information seekers who are confident in seeking the right healthcare information are more likely to be highly involved in SDM. Better healthcare engagement by taking their own health information to their doctor's visits results in a better patient-provider relationship. Consistent with this finding, high health literacy corresponds with higher levels of empowerment, improved decision-making skills, and a more active role in treatment (Visscher et al., 2018). Providing health education is considered a societal role in supporting and guiding the inactive and non-participatory individuals to become active and productive participants in healthcare decision-making (Gruman et al., 2010). To avoid the risk of preventable illness, suboptimal health outcomes, and wasted resources, the conceptual "Engagement Behavior Framework" (EBF) was utilized. The concept affirms that patients and consumers alike must make informed decisions about insurance and clinicians to work with, coordinate the complex treatments to solve their health concerns, and organize the communications among these providers. Delivering health education with patient engagement technology can improve communication between the patients and healthcare providers to configure a personalized, informed decision (Prey et al., 2014). For instance, the eHealth usage in engaging patients in their healthcare broadened this patient engagement relationship in three dimensions, namely, behavioral (what the patient does), cognitive (what the patient believes and knows), and

BRIDGING HEALTH LITERACY

emotional (what the patient feels) (Rathert et al., 2017). In a similar study, the ‘edutainment’ intervention provided the participants with enough information to help them decide on what therapy is indicated for their respective conditions (Lopez-Olivo et al., 2018).

The effect of patient education delivery increases in the level of knowledge and satisfaction with education (Keulers, Welters, Spauwen, & Houpt, 2007). The knowledge scores after computer-based patient education were significantly higher regardless of age, gender, the frequency of computer use, previous CTS operation, previous CTS education, and education level. Along those lines, utilizing tablet computers to engage patients in their care and discharge planning showed improved communication with their nurses (74%) and with their physicians (53%), as well as increased patient understanding of their medications (90%) during their inpatient hospitalization (Winstanley et al., 2017). Additionally, even older participants and those less experienced in technology such as the Internet were equally capable of using the new health education delivery.

In the era of electronic health records, there are six-essential patient-physician communication functions, namely fostering relationships, pertinent information exchange, responding-to-emotions, managing uncertainty, decision making, and enabling self-management (Rathert, Mittler, Banerjee, & McDaniel, 2017). The patient education portals and secure messaging help patients keep track of their histories, remember what was discussed, and prepare for clinical encounters. This collaborative relationship between the patient and provider empowered the patient to become more involved and engaged in his or her care.

Improved self-management skills

The-passing rate for the post-video knowledge test using an iPad to learn about warfarin was significantly higher than the passing rate for the pre-video knowledge test (Kim,

BRIDGING HEALTH LITERACY

Mohammad, Coley & Donihi, 2015). There was an improvement in patients' differentiating when to call their providers for more significant bleeding problems such as hematuria; however, the most considerable improvement was seen in diet and use of over the counter (OTC) medications. Another electronic tablet-based inhaler education showed an improved technique of inhaler use irrespective of specialty or previous personal or family member inhaler use (Mulhall et al., 2017) The inhaler technique scores improved by 44% in the multimedia group and only 19% in the print-based group. At the same time, even educational material can improve in the inhaler technique (Beatty, Flynn, & Costello, 2017).

Low caregiver health literacy was associated with a reduction in care recipient self-management behaviors, increased care recipient usage of healthcare services, and compounded the incidence of caregiver burden (Yuen, Knight, Ricciardelli, & Burney, 2018). Caring for adult care recipients differs from caregiving in pediatric populations because the adult care recipients participate in healthcare decision-making. For this reason, a tailored intervention to address the patient's health literacy needs will benefit both the care recipients and caregivers by improving individual health outcomes.

Increased adherence to treatment plans

Patients with high health literacy adhered to their treatment plans at nearly twice the rate of patients with low health literacy (Miller, 2016). Patients who received interventions were nearly three times as likely to have high health literacy. In contrast, patients who received no intervention were twice as likely to remain at low health literacy levels. Accordingly, the risk of nonadherence was nearly double in participants with no intervention. The group who participated in the intervention had twice the likelihood to adhere to the treatment plan. This study

BRIDGING HEALTH LITERACY

established that patients who received interventions were able to expand their health literacy and had a 16% higher rate of treatment plan adherence.

Higher patient activation measure level was related to 9 out of 13 better health outcomes, which include but are not limited to improved clinical indicators, better health behaviors, and increased use of women's preventive screening tests (Greene, Hibbard, Sacks, Overton, & Parrotta, 2015). The Patient Activation Measure (PAM) is a 13-item metric scale that quantifies the patients' "engagement," activation, or self-management capabilities. Highly activated patients continued to have normal HDL, serum triglycerides, and PHQ-9 levels as well as undergoing cancer screening tests (Pap smears and mammography).

Supporting people with low health literacy could improve patients' medication knowledge and adherence (Wali et al., 2016). The most efficient interventions are tailored interventions that can manage barriers to health literacy. Consistent with this study that tackles barriers to health literacy, the hour-long 1:1 educational pre-discharge session using the health belief model (HBM) session provided patients with the appropriate mechanism to change their old lifestyles, including identifying barriers to achieving their goals (Eshah, 2013). With this application of patient education delivery, it led to a significant improvement in health responsibility, nutrition, and interpersonal relations.

Improved quality of life

Patients with low HL pay little attention to their health status; hence, their unhealthy behavioral habits continue (Zheng et al., 2018). In this study, health skills refer to the ability of an individual to transform health knowledge into healthy behavior. The study concluded that improved health status and quality of life (QOL) comes from excellent health skills. This study

BRIDGING HEALTH LITERACY

has similar findings to those of Eshah (2013) wherein both studies further showed that health skills and quality of life are strongly correlated.

Additionally, poor health literacy is strongly linked to lower QOL in all four domains, namely, physical, psychological, social relationships, and environment, particularly for older people (Panagioti et al., 2018). Not only is this alarming because approximately one in every five patients had health literacy problems; it is also disturbing because having poor health literacy is a significant independent predictor of lower QOL in older patients with long-term conditions.

Discussion and Conclusion

Discussion

There is no gold standard for measuring health literacy among the pieces of literature reviewed. The commonality of studies reviewed is the significance of health literacy in patient engagement, healthcare decision-making, self-management skills, and adherence to the treatment plan. With knowledge, patients can be empowered to manage their health problems, thus enabling them to participate in healthcare-associated decisions (Wigfall & Tanner, 2018; Visscher et al., 2018; Gruman et al., 2010; Lopez-Olivo et al., 2018; Prey et al., 2014; Keulers, Welters, Spauwen, & Houpt, 2017; Rathert, Mittler, Banerjee, & McDaniel, 2017), increase their overall satisfaction score with their care (Greysen et al., 2014), and improve their communication with healthcare providers (Lopez-Olivo et al., 2018; Gruman et al., 2010; Visscher et al., 2018; Rathert, Mittler, Banerjee, & McDaniel, 2017; Winstanley et al., 2017).

Better communication could reap benefits in the recovery of a patient or the enhanced self-management in warfarin use (Kim, Mohammad, Coley, & Donihi, 2015), and inhaler usage by patients with COPD (Mulhall et al., 2017; Beatty, Flynn, & Costello, 2017). Caregivers with low health literacy provide poor health management to the care recipient, increase healthcare

BRIDGING HEALTH LITERACY

service usage to both the caregiver and care recipient, and promote caregiver burden (Yuen, Knight, Ricciardelli, & Burney, 2018).

Changing the delivery of patient education has been proven effective in improving patient's health outcomes in acute coronary syndrome (Eshah, 2013), carpal tunnel syndrome (Keulers, Welters, Spauwen, & Houpt, 2007), knee osteoarthritis, osteoporosis, and rheumatoid arthritis (Lopez-Olivio et al., 2018), and multiple long-term conditions (Panagioti et al., 2018). Effective patient education methods enable patients to manage barriers to health literacy (Wali et al., 2016; Eshah, 2013) and, in this way, patient's health literacy promotes patient engagement and treatment adherence (Miller, 2016; Greene, Hibbard, Sacks, Overton, & Parrotta, 2015; Wali et al., 2016; Eshah, 2013).

Conclusion

The gap in the literature regarding how patient education plays a vital role in health literacy and patient engagement represents a crucial aspect of patient care that should be considered, particularly regarding goals of care, treatment, and outcomes. Correctly providing personalized patient education depends on more than just the technology or the patient's reading level of health information provided to the patient; instead, patient education must also address the social determinants of health, e.g., housing uncertainty, food insecurity, and inadequate social support. These essential interventions should be in congruence with the patient's innate capacity for self-care, personal and contextual issues, and resource limitations.

Delivering effective health education could significantly improve patient's understanding of the care they had in the hospital and of the information they need to fully recover at home. With the use of standardized health education delivery, the frontline staff will be able to provide their patients the latest evidenced-based information without confusion. By reinforcing and

BRIDGING HEALTH LITERACY

repeating the consistent information from the different level of care locations, patients will be equipped with appropriate strategies to cope with daily decision-making that impacts their health. This activity will also further facilitate the meaningful exchange of information between patients and healthcare providers to better the quality of care delivered.

Healthcare providers must ensure that patients understand the information provided to them regardless of a patient's health literacy level. The healthcare organization must prepare the budget for needed practice change and for regulatory changes to educate the frontline staff. A high chance of better and cohesive collaboration is attainable with the staff's involvement in the design, implementation, and evaluation of patient education delivery. Consequently, staff must have the proper training and knowledge to emphasize patient involvement throughout each step of patient education. This improved continuity of care among healthcare providers supports and enriches the patients' self-management and health skills.

Implication for Future Practice

The emergence of new information technologies has created new opportunities and challenges for a settings approach to health promotion. Overall, a collaborative intervention on laws, policies, research initiatives, organizational strategies, and clinical practices is crucial for facing the challenges created by limited health literacy. It is by increasing health literacy, improving patient engagement, and reducing healthcare costs that a healthcare service system can pave the way for the achievement of enhanced sustainability.

BRIDGING HEALTH LITERACY

References:

Ahmad, F. S., Barg, F. K., Bowles, K. H., Alexander, M., Goldberg, L. R., French, B., ...

Kimmel, S. E. (2016). Comparing perspectives of patients, caregivers, and clinicians on heart failure management. *Journal of Cardiac Failure*, 22(3), 210–217.

<https://doi.org/10.1016/j.cardfail.2015.10.011>

Agency for Healthcare Research and Quality (n.d.) *Health literacy measurement tool (Revised)*.

Fact Sheet. Accessed at <https://www.ahrq.gov/professionals/qualitypatient-safety/quality-resources/tools/literacy/index.html>

Albert, N. M., Cohen, B., Liu, X., Best, C. H., Aspinwall, L., & Pratt, L. (2015). Hospital nurses' comfort in and frequency of delivering heart failure self-care education. *European*

Journal of Cardiovascular Nursing, 14(5), 431-440. doi:10.1177/1474515114540756

Anderson, K. M. (2014). Discharge clinical characteristics and 60-day readmission in patients hospitalized with heart failure. *Journal of Cardiovascular Nursing*, 29(3), 232-241.

doi:10.1097/JCN.0b013e31828f0d25

Beatty, C. R., Flynn, L. A., & Costello, T. J. (2017). The impact of health literacy level on

inhaler technique in patients with chronic obstructive pulmonary disease. *Journal of*

Pharmacy Practice, 30(1), 25-30. doi:10.1177/0897190015585759

Boyle, J., Speroff, T., Worley, K., Cao, A., Goggins, K., Dittus, R. S., & Kripalani, S. (2017).

Low Health Literacy is associated with increased transitional care needs in hospitalized patients. *J Hosp Med*, 12(11), 918-924. doi:10.12788/jhm.2841

Clark, B. (2011). Using law to fight silent epidemic: the role of healthy literacy in health care access, quality cost. *Annals of Health Law*, 20(2), 253-328.

BRIDGING HEALTH LITERACY

Cox, S. R., Liebl, M. G., McComb, M. N., Chau, J. Q., Wilson, A. A., Achi, M., . . . Wallace, D.

(2017). Association between health literacy and 30-day healthcare use after hospital discharge in the heart failure population. *Res Social Adm Pharm*, 13(4), 754-758.

doi:10.1016/j.sapharm.2016.09.003

Creber, R. M. M., Grossman, L. V., Ryan, B., Qian, M., Polubriaginof, F. C. G., Restaino, S., . . .

Masterson Creber, R. M. (2019). Engaging hospitalized patients with personalized health information: a randomized trial of an inpatient portal. *Journal of the American Medical Informatics Association*, 26(2), 115-123. doi:10.1093/jamia/ocy146

Easton, P., Entwistle, V. A., & Williams, B. (2013). How the stigma of low literacy can impair patient-professional spoken interactions and affect health: insights from a qualitative investigation. *BMC Health Services Research*, (1), doi:10.1186/1472-6963-13-319

Eibner, C., Krull, H., Brown, K. M., Cefalu, M., Mulcahy, A. W., Pollard, M., . . . Farmer, C. M.

(2016). Current and projected characteristics and unique health care needs of the patient population served by the Department of Veterans Affairs. *Rand Health Quarterly*, 5(4), 13.

Eshah, N. F. (2013). Predischage education improves adherence to a healthy lifestyle among Jordanian patients with acute coronary syndrome. *Nurs Health Sci*, 15(3), 273-279.

doi:10.1111/nhs.12018

Friis, K., Lasgaard, M., Rowlands, G., Osborne, R. H., & Maindal, H. T. (2016). Health literacy mediates the relationship between educational attainment and health behavior: a Danish population-based study. *Journal of Health Communication*, 21, 54-60.

doi:10.1080/10810730.2016.1201175

BRIDGING HEALTH LITERACY

Gilotra, N. A., Shpigel, A., Okwuosa, I. S., Tamrat, R., Flowers, D., & Russell, S. D. (2017).

Patients commonly believe their heart failure hospitalizations are preventable and identify worsening heart failure, nonadherence, and a knowledge gap as reasons for admission.

Journal of Cardiac Failure, 23(3), 252–256.

<https://doi.org/10.1016/j.cardfail.2016.09.024>

Greco, A., Steca, P., Pozzi, R., Monzani, D., Malfatto, G., & Parati, G. (2015). The influence of

illness severity on health satisfaction in patients with cardiovascular disease: the

mediating role of illness perception and self-efficacy beliefs. *Behav Med*, 41(1), 9-17.

doi:10.1080/08964289.2013.855159

Greco, A., Steca, P., Pozzi, R., Monzani, D., Malfatto, G., & Parati, G. (2015). The influence of

illness severity on health satisfaction in patients with cardiovascular disease: the

mediating role of illness perception and self-efficacy beliefs. *Behavioral Medicine*, 41(1),

9-17. doi:10.1080/08964289.2013.855159

Greene, J., Hibbard, J. H., Sacks, R., Overton, V., & Parrotta, C. D. (2015). When patient

activation levels change, health outcomes and costs change, too. *Health Affairs (Project*

Hope), (3), 431. <https://doi.org/10.1377/hlthaff.2014.0452>

Gruman, J., Rovner, M. H., French, M. E., Jeffress, D., Sofaer, S., Shaller, D., & Prager, D. J.

(2010). From patient education to patient engagement: implications for the field of

patient education. *Patient Educ Couns*, 78(3), 350-356. doi:10.1016/j.pec.2010.02.002

Haun, J., Luther, S., Dodd, V., & Donaldson, P. (2012). Measurement variation across health

literacy assessments: implications for assessment selection in research and practice. *J*

Health Community, 17 Suppl 3, 141-159. doi:10.1080/10810730.2012.712615

BRIDGING HEALTH LITERACY

- Jacobs, R. J., Lou, J. Q., Ownby, R. L., & Caballero, J. (2016). A systematic review of eHealth interventions to improve health literacy. *Health Informatics Journal*, 22(2), 81-98.
doi:10.1177/1460458214534092
- Keulers, B. J., Welters, C. F., Spauwen, P. H., & Houpt, P. (2007). Can face-to-face patient education be replaced by computer-based patient education? a randomised trial. *Patient Educ Couns*, 67(1-2), 176-182. doi:10.1016/j.pec.2007.03.012
- Kim, J. J., Mohammad, R. A., Coley, K. C., & Donihi, A. C. (2015). Use of an iPad to provide warfarin video education to hospitalized patients. *J Patient Saf*, 11(3), 160-165.
doi:10.1097/PTS.0000000000000062
- Liang L, Cako A, Urquhart R, et al, Patient engagement in hospital health service planning and improvement: a scoping review, *BMJ Open* 2018;8:e018263. doi: 10.1136/bmjopen-2017-018263
- Liang, C.-Y., Wang, K.-Y., Hwang, S.-J., Lin, K.-C., & Pan, H.-H. (2013). Factors affecting the physician–patient relationship of older veterans with inadequate health literacy: an observational study. *British Journal of General Practice*. doi:10.3399/bjgp13X667222
- Lopez-Olivo, M. A., Ingleshwar, A., Volk, R. J., Jibaja-Weiss, M., Barbo, A., Saag, K., . . . Suarez-Almazor, M. E. (2018). Development and pilot testing of multimedia patient education tools for patients with knee osteoarthritis, osteoporosis, and rheumatoid arthritis. *Arthritis Care Res (Hoboken)*, 70(2), 213-220. doi:10.1002/acr.23271
- Machlin, S. R., & Muhuri, P. (2018). *Characteristics and health care expenditures of VA health system users versus other Veterans, 2014-2015 (Combined)*. Statistical Brief #508. January 2018. Agency for Healthcare Research and Quality, Rockville, MD. Retrieved from http://www.meps.ahrq.gov/mepsweb/data_files/publications/st508/stat508.pdf

BRIDGING HEALTH LITERACY

- Matsuoka, S., Tsuchihashi-Makaya, M., Kayane, T., Yamada, M., Wakabayashi, R., Kato, N. P., & Yazawa, M. (2016). Health literacy is independently associated with self-care behavior in patients with heart failure. *Patient Education & Counseling*, 99(6), 1026–1032.
<https://doi.org/10.1016/j.pec.2016.01.003>
- McCormack, L., Thomas, V., Lewis, M. A., & Rudd, R. (2017). Improving low health literacy and patient engagement: A social ecological approach. *Patient Education and Counseling*, 100(1), 8-13. doi:10.1016/j.pec.2016.07.007
- Miller, T. A. (2016). Health literacy and adherence to medical treatment in chronic and acute illness: a meta-analysis. *Patient Educ Couns*, 99(7), 1079-1086.
doi:10.1016/j.pec.2016.01.020
- Mitchell, S. E., Sadikova, E., Jack, B. W., & Paasche-Orlow, M. K. (2012). Health literacy and 30-day postdischarge hospital utilization. *Journal of Health Communication*, 17325-338.
doi:10.1080/10810730.2012.715233
- Muhlbacher, A. C., Bethge, S., Reed, S. D., & Schulman, K. A. (2016). Patient preferences for features of health care delivery systems: a discrete choice experiment. *Health Serv Res*, 51(2), 704-727. doi:10.1111/1475-6773.12345
- Mulhall, A. M., Zafar, M. A., Record, S., Channell, H., & Panos, R. J. (2017). A tablet-based multimedia education tool improves provider and subject knowledge of inhaler use techniques. *Respiratory Care*, 62(2), 163-171. doi:10.4187/respcare.05008
- Nurhayati, N., Songwathana, P., & Vachprasit, R. (2018). Surgical patients' experiences of readiness for hospital discharge and perceived quality of discharge teaching in acute care hospitals. *J Clin Nurs*. doi:10.1111/jocn.14764

BRIDGING HEALTH LITERACY

Panagioti, M., Skevington, S. M., Hann, M., Howells, K., Blakemore, A., Reeves, D., & Bower,

P. (2018). Effect of health literacy on the quality of life of older patients with long-term conditions: a large cohort study in UK general practice. *Quality of Life Research*, 27(5), 1257-1268. doi:10.1007/s11136-017-1775-2

Prey, J. E., Woollen, J., Wilcox, L., Sackeim, A. D., Hripcsak, G., Bakken, S., . . . Vawdrey, D.

K. (2014). Patient engagement in the inpatient setting: a systematic review. *J Am Med Inform Assoc*, 21(4), 742-750. doi:10.1136/amiajnl-2013-002141

Rathert, C., Mittler, J. N., Banerjee, S., & McDaniel, J. (2017). Patient-centered communication

in the era of electronic health records: what does the evidence say? *Patient Education and Counseling*, 100(1), 50-64. doi:https://doi.org/10.1016/j.pec.2016.07.031

Sand-Jecklin, K., Daniels, C. S., & Lucke-Wold, N. (2017). Incorporating health literacy

screening into patients' health assessment. *Clinical Nursing Research*, 26(2), 176–190. <https://doi.org/10.1177/1054773815619592>

Spangler L, Reed SD, Nekhyludov L, Grothaus LC, LaCroix AZ, Newton KM, ... Newton, K.

M. (2009). Provider attributes associated with hormone therapy prescribing frequency. *Menopause* (10723714), 16(4), 810–816.

<https://doi.org/10.1097/GME.0b013e318198e2fd>

US Department of Defense. (n.d.). *Total active duty US Department of Defense personnel*

numbers from 1995 to 2016. In Statista - The Statistics Portal. Retrieved from <https://0-www-statista-com.ignacio.usfca.edu/statistics/232350/us-department-of-defense-personnel-numbers/>.

US Department of Veterans Affairs (n.d.). *Veterans Integrated Service Networks (VISN)*.

Retrieved from <https://www.va.gov/directory/guide/division.asp?dnum=1>

BRIDGING HEALTH LITERACY

- Veterans' Health Administration (n.d.). *Where do I get the care I need?* - Veterans Health Administration. Retrieved from <https://www.va.gov/health/findcare.aspre.asp>
- Visscher, B. B., Steunenberg, B., Heijmans, M., Hofstede, J. M., Deville, W., van der Heide, I., & Rademakers, J. (2018). Evidence on the effectiveness of health literacy interventions in the EU: a systematic review. *BMC Public Health*, 18(1), 1414. doi:10.1186/s12889-018-6331-7
- Voils, C. I., Sleath, B., & Maciejewski, M. L. (2014). Patient perspectives on having multiple versus single prescribers of chronic disease medications: results of a qualitative study in a veteran population. *BMC Health Services Research*, 14, 490. <http://doi.org/10.1186/s12913-014-0490-8>
- Wali, H., Hudani, Z., Wali, S., Mercer, K., & Grindrod, K. (2016). A systematic review of interventions to improve medication information for low health literate populations. *Res Social Adm Pharm*, 12(6), 830-864. doi:10.1016/j.sapharm.2015.12.001
- Watters, A., Bergstrom, A., & Sandefer, R. (2016). Patient engagement and meaningful use: assessing the impact of the EHR incentive program on cultural competence in healthcare. *Journal Of Cultural Diversity*, 23(3), 114-120.
- Wigfall, L. T., & Tanner, A. H. (2018). Health literacy and healthcare engagement as predictors of shared decision-making among adult information seekers in the USA: a secondary data analysis of the health information national trends survey. *J Cancer Educ*, 33(1), 67-73. doi:10.1007/s13187-016-1052-z
- Winstanley, E., Zhang, Y., Burtchin, M., Campbell, P., Beck, S., Bohenek, W., & Pahl, J. (2017). Inpatient experiences with MyChart bedside. *Telemedicine And E-Health*, 23(8), 691-693. doi:10.1089/tmj.2016.0132

BRIDGING HEALTH LITERACY

- Yoon, J., Zulman, D., Scott, J. Y., & Maciejewski, M. L. (2014). Costs associated with multimorbidity among VA patients. *Medical Care*, 52S31-6.
doi:10.1097/MLR.0000000000000061
- Yu, W., Ravelo, A., Wagner, T., Phibbs, C., Bhandari, A., Chen, S., & ... Barnett, P. G. (2003). Prevalence and costs of chronic conditions in the VA health care system. *Medical Care Research & Review*, 60(3), 146S-67S. <https://doi.org/10.1177/1077558703257000>
- Yuen, E. Y. N., Knight, T., Ricciardelli, L. A., & Burney, S. (2018). Health literacy of caregivers of adult care recipients: A systematic scoping review. *Health Soc Care Community*, 26(2), e191-e206. doi:10.1111/hsc.12368
- Zheng, M., Jin, H., Shi, N., Duan, C., Wang, D., Yu, X., & Li, X. (2018). The relationship between health literacy and quality of life: a systematic review and meta-analysis. *Health Qual Life Outcomes*, 16(1), 201. doi:10.1186/s12955-01

