

The Relationship Between Diabetes Management And Health Literacy

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Problem Statement

Diabetes mellitus is a common health condition affecting individuals, their loved ones as well as society. Diabetes affects many communities in the U.S. as well as other parts of the world. Diabetes can be managed; however, the existing treatment options require patient's full engagement in the treatment plan by complying to manage their blood sugar levels (Diabetes | CDC", 2017). According to the CDC's latest national estimates, approximately 40.1 million people in the United States had diagnosed or undiagnosed diabetes in 2023, representing about 12% of the population. The earlier 2012 figures should be treated as historical rather than current. There are significant associations between diabetes complications and other major issues such as premature death, diminished quality of life, decreased life expectancy (Chinenye, Oputa, & Oko-Jaja, 2012), increased preventable hospital visits, high use of emergency departments, and multiple hospital readmissions (DHHS, 2016). Poor health literacy according to Safeer, Cooke, and Keenan, (2006) has a significant association between treatment noncompliance and poor health status.

There is a need to establish the relationship between diabetes management and health literacy. American Association of Diabetes Educators (2013) established that literacy skills are high for most Americans living with diabetes. Schulz & Nakamoto (2013) argues that among primary care patients with type 2 diabetes, inadequate health literacy is independently associated with worse glycemic control and higher rates of retinopathy. Inadequate health literacy may contribute to the disproportionate burden of diabetes-related problems among disadvantaged populations. Efforts should focus on developing and evaluating interventions to improve diabetes outcomes among patients with inadequate health literacy. According to their report, lack of health literacy has been blamed for creating a vacuum as regards the attitude of most diabetes patients to manage the disease.

Previous researchers have identified a positive correlation between health literacy and self-management of diabetes DeWalt, D., Berkman, N., Sheridan, S., Lohr, K., and Pignone, M., (2004), asserted that patient behavior about self-management have clinched that adequate health literacy is central to achieve diabetic control. Similar research organized in Europe established the same results (Broucke, 2016). The different implications from research on diabetic control, however, call for the adoption of more feasible techniques. One such area that needs comprehensive exploration is the design of interventions that can efficiently accommodate low health literacy, which is largely represented in the 27.8 percent of undiagnosed cases. This includes identifying and determining the

efficacy of techniques that can cater to the needs of patients with low health literacy in a bid to enhance the health outcomes of diabetes therapies (Kim & Lee, 2016).

This proposal will discuss in detail the association between health literacy and compliance with diabetes treatment in patients from different age groups, such as the younger between the ages of 12-18, adults 18-30, and then the aged people between the ages of 30 and 60. The main focus of the study will be an exploration of effective particular techniques of self-management for patients with low health literacy to decrease the rate of diabetes in the US (Martin, Williams, Haskard, & DiMatteo, 2005). The scope of this study is very broad as it investigates the effects of health literacy among diabetic patients in the US in the age range of 18 to 60 years. It will determine whether the level of literacy can affect a patient's health or has no effect on the health outcomes. In case of positive effects of health literacy on a patient's health, this study will help the health organizations and health care providers to develop literary material according to the literacy level of the general population and help them to devise certain beneficial apps so that the technology can play its part to support patients in the modification of lifestyle and routine according to the requirements of their disease.

With the help of this study, the people and the health care and nursing staff can focus on health literacy and can make people aware of diabetes and other such chronic disease. In this way, the people will be able to understand the importance of health measures and will manage their lifestyles to have a healthy life. The variables for the study will be health literacy (independent variable), compliance with exclusive diabetes treatment therapy and self-care (Dependent variables).

Significance

The statistics established by Hass and Maryniuk (2014) indicated that over 18 million Americans had been diagnosed with diabetes. According to the American Diabetes Association (2012), the percentage of Americans aged 65 and older remains high, at 25.9%, or 11.8 million seniors (diagnosed and undiagnosed), while 86 million Americans aged 20 and older had prediabetes. About 1.4 million Americans are diagnosed with diabetes every year. In an updated 2015 CDC report, diabetes remains the 7th leading cause of death in the United States. More than 24 per 100,000 population deaths have been observed in death certificates listing it as the underlying cause of mortality. The study also reports a total of 234,051 death certificates listing diabetes as an underlying or contributing cause of death (American Diabetes Association, 2017).

Thus, it can be stated that health literacy is important for people. It not only helps people to take control of their disease but also helps in reducing the risk of being affected by any disease. Health literacy helps in reducing the rate of diseases. Lack of basic health literacy is a problem that needs to be addressed to achieve the goal of prevention and management of diabetes. Health literacy has a significant association with poor health status, as those with low health literacy often ignore necessary preventive measures and disease management protocols. Poor health literacy, according to Safeer, Cooke, and Keenan, (2006) has a significant association between treatment noncompliance

and poor health status. Jones, Treiber, and Jones (2014) and Zimmerman et al., 2015, supported that by inferring that noncompliance to prescribed medication therapy accounts for poor health outcomes and complications, whereas adherence to the medication therapy plays a significant role in the treatment of chronic diseases such as diabetes. Most diabetes medications, such as insulin, are titrated (through the sliding scale) according to the result of the blood glucose, thus requiring the knowledge of numbers as well as time (Khunti, Davies, and Kalra, 2013). Thus, the knowledge of numerical values, as well as the ability to read and understand the drug labels or instructions, is required for adequate compliance.

American Association of Diabetes Educators (2013), pointed out that most Americans are short of basic knowledge concerning medical care and that is a major issue. Health literacy has been singled out as the main threat for handling cases such as diabetes cases in most communities living in America (Center for Healthcare Strategies, 2013). Unfortunately, as the prevalence of diabetes is predicted to be on a continuous rise, literacy levels, on the other hand, have remained flat. Low health literacy is associated with uneven implications of diabetes-related challenges, especially within disadvantaged populations. This has given the growing number of concerns regarding diabetes literacy; this study stands to provide useful information needed for the design of interventions that could effectively cater to the needs of individuals with low health literacy.

This study will dissect the multiple layers of the impact of health literacy on the patient's compliance with diabetic treatment and routine. It will analyze the results of the importance of health awareness in patients with chronic diseases, especially diabetes. The significance of health literacy related to diabetes will be studied in detail with reference to the patients of different age groups residing in the city of Chicago. The studied age groups will include the younger between the ages of 12-18, adults 18-30, and then the aged people between the ages of 30 and 60. With the help of this study, the health care and nursing staff will be able to make a plan to make people of the state aware of diabetes and will take steps to increase health awareness in diabetic patients. Such plans or healthcare checks will enable the healthcare faculty to guide the people about the prevalence of diabetes and can make them aware of diabetes and its effects on life.

Background

1. Khunti, Davies, and Kalra (2013) provided information regarding the importance of the knowledge of numbers as well as time in insulin titration (through the sliding scale) based on the blood glucose level.
2. Safeer, Cooke, and Keenan (2006) offer vital information on the impact of health literacy on cardiovascular disease.
3. Aikens and Piette (2009) presented views on why diabetic patients underuse diabetes treatment therapy.
4. Mendoza and Rosenborg (2013) have critically probed the efficiency of self-management diabetes and health literacy. They offer useful insights that point to the inefficiency of this

approach using CDC statistics.

5. Chinenye, Oputa, and Oko-Jaja (2014) offer recommendations for the need for improved primary care in rural communities as well as others that align with the possible approach to be used in this study.
6. DHHS Office of Disease Prevention and Health Promotion (2016) provided information about how poor health literacy is significantly associated with poor health status, as those with low health literacy often ignore necessary preventive measures and disease treatment therapy.

Framework

The theoretical foundation for this study will be based on a model consisting of three overlapping spheres of activity, namely health education, disease prevention and health protection, based on the interventional model of Raingruber (2009). The model defines health promotion as fostering healthy habits and prevention of illness with the help of strategies and different environmental and social factors as community-based actions. The three overlapping spheres of this model focus on:

1. Health education- which is designed to change the knowledge, beliefs, attitudes, and behavior that enhances health.
2. Disease Prevention, which encompasses primary, secondary and tertiary stages of disease prevention, is designed to decrease risk factors and reduce the implications of the disease.
3. Health protection emphasizes proper controls and policies and voluntary codes of practice aimed at preventing ill health and enhancing well-being (Raingruber, 2009).

The model is in line with the core of this proposal, health advocacy to give the population under study basic health education on the disease process, prevention and management of diabetes. Diabetes treatment compliance has been studied by several researchers, but this study will focus on diabetic patients of different age groups in the city of Chicago. The study will determine the effect of health literacy on the condition of diabetic patients who show compliance with diabetic treatment.

Research Question(S) And Hypotheses

1. Is there an association between health literacy and diabetes management among the studied population of Chicago?

HO – There is no significant association between health literacy and diabetes management among the studied population of Chicago.

Ha – There is a significant association between health literacy and diabetes management among the studied population of Chicago.

2. Is there an association between [health literacy and compliance with diabetes treatment](#) among

the studied population of Chicago?

HO – There is no significant association between health literacy and compliance with diabetes treatment among the studied population of Chicago.

Ha – There is a significant association between health literacy and compliance with diabetes treatment among the studied population of Chicago.

Initiative Design/Methods

The major focus of the research is to evaluate whether health literacy has a positive impact on the rate of diabetes among the studied population of Chicago or no impact on it. The variables are health literacy and diabetes treatment therapy. The variable health literacy is an independent variable because health literacy can be provided to younger, old, and adults too and it does not depend on anything. Better physical activities, healthy diet plans, proper care, and medication are so helpful in controlling diabetes. It depends on the patient's choice whether to learn from literacy or not. However, the second variable is the prevalence of diabetes, which depends on health literacy and is a dependent variable. With the help of this variable, the study will evaluate the association between the two, that is, whether health literacy helped the patients among the studied population of Chicago to control their diabetes level or whether it has no association with their diabetes and its prevention. Thus, with the help of this variable, the study will conclude the impact of health literacy on the prevalence of diabetes in younger adults and old people.

The research design of the study is qualitative, in which initial literature analysis will be done in order to find the answers to research questions. Initially, the data will be collected via different sources and then filtered to analyze the useful data and eliminate cofounders. The primary means of information gathering enlisted are the research works found in online libraries as well as products publically available on open sources like American Diabetes Association accumulated data, Health and Adult Literacy Survey (HALS), and articles from MEDLINE, CINAHL, Psyc INFO, PUBMED, Walden library databases and other reliable internet sources. The researched data will be based on four approaches. How is health literacy helping diabetic patients among the studied population of Chicago in controlling their blood sugar and insulin levels? What should be the methodologies for the under-study population without a basic literacy level to control diabetes? How may health literacy help aged people control their diabetes? How modern technology and its awareness may help the diabetic patients of Chicago to control their diabetes.

Initially, the research design will be separately analyzed for the younger, adults, and old people separately. The purpose of this separate analysis is to examine the ratio of diabetes in younger, adult, and old people, respectively. Moreover, it will help to understand how health literacy helps these people in the prevalence of diabetes. This means that the sample design will consist of younger individuals between the ages of 12-18, adults between 18-30, and then ages between 30 and 60.

As indicated by various studies reviewed, lifestyle or behaviors play an essential role in the prevalence of diabetes among younger adults and aged people (Rudd & Comings, 1994). Therefore, the use of the detailed design must be highly efficacious for both descriptions, as well as the acquisition of pertinent information on informational resources, personal factors, awareness, health-promoting behaviors, the knowledge regarding the disease, and to facilitate the collection of huge amounts of unique data. Thus by reviewing the data from different resources, it will be evaluated that how the literacy can help the diabetic patients to control their sugar level and what are the effects of diabetes treatment compliance on patient health.

Nature Of The Study

The research design of the study will be a quantitative analysis of secondary data. The outcomes will be estimated by analyzing the correlation between the health literacy and the management of diabetes, chi-square test will be employed to check the homogeneity of variance that is also called homoscedasticity (Wu, Chung, Lennie, Hall, & Moser, 2008). The independent variables are health literacy, and the dependent variable will be the eligibility for healthcare services, rate of diabetes and diabetes treatment therapy correspondingly. Lastly, the technology is taken as an independent variable to estimate the self-management of diabetes as the dependent variable. SPSS will be computed to generate logistic regression, which will be used to interpret the p-values. The null hypothesis will be rejected if $p < .05$.

Secondary Data Types And Sources Of Information

The data for all variables, i.e., health literacy rate, the rate of diabetic patients, technology and the self-management of diabetes, will be collected from secondary sources. The secondary sources used to accumulate data include the facts from the American Diabetes Association, MEDLINE, CINAHL, PsycINFO, PUBMED and Walden Library, respectively. The online resources including the Health and Adult Literacy Survey (HALS) may also be used for the data collection.

References

American Diabetes Association's Guidelines Are Killing Diabetics! (2011, June 7). Retrieved June 22, 2017, from <http://www.anh-usa.org/american-diabetes-association-guidelines-killing-diabetics/>

American Diabetes Association. (2016). Statistics about diabetes: Overall numbers, diabetes, and prediabetes. Retrieved from American Diabetes Association: <http://www.diabetes.org/diabetes-basics/statistics/?referrer=https://www.google.com/>

American Association of Diabetes Educators. (2013). Communicating Effectively with Patients: The Importance of Addressing Health Literacy and Numeracy. Retrieved February 9, 2017, from American

- Association of Diabetes Educators: https://www.diabeteseducator.org/docs/default-source/legacy/docs/_resources/pdf/research/aade_health_literacy_and_numeracy_white_paper_final.pdf?sfvrsn=2
- American Diabetes Association. (2017). Standards of Medical Care in Diabetes- 2017. Retrieved February 9, 2017, from Volume 40, Supplement 1: http://professional.diabetes.org/sites/professional.diabetes.org/files/media/dc_40_s1_final.pdf
- Aikens, E., Piette, D. (2009). Diabetic patients' medication underuse, illness outcomes, and beliefs about antihyperglycemic and antihypertensive treatments. *Diabetes Care*, 32 (1), 19-24.
- Binh, T., Phuong, P., Nhung, B. (2015). Knowledge and associated factors towards type 2 diabetes among a rural population in the Red River Delta region, Vietnam. *Rural And Remote Health*, 15 (3), 3275.
- Broucke, S. V. (2016). Diabetes literacy. Enhancing the Effectiveness of Diabetes Self-Management Education. Retrieved February 9, 2017, from Final Report. Louvain-la-Neuve: Universite Catholique de Louvain: <http://cordis.europa.eu/docs/results/306/306186/final1-diabetesliteracyfinal.pdf>
- Chinenye, Oputa, and Oko-Jaja, (2014). Diabetes and related diseases in Nigeria: Need for improved primary care in rural communities. *Journal of Health Science*, 2(2), April/June.
- Center for Healthcare Strategies. (2013). Health Literacy. Retrieved February 9, 2017, from Fact Sheet 1: http://www.chcs.org/media/CHCS_Health_Literacy_Fact_Sheets_2013.pdf
- Diabetes Association of Nigeria. (2013). Clinical practice guidelines for diabetes management in Nigeria. Retrieved from Diabetes Nigeria: <http://diabetesnigeria.org/clinical-practice-guidelines-for-diabetes-management-in-nigeria/>
- DeWalt, D., Berkman, N., Sheridan, S., Lohr, K., and Pignone, M. (2004). Literacy and health outcomes. *Journal of General Internal Medicine*, 19(12): 1228-1239. doi: 10.1111/j.1525-1497.2004.40153.x.
- Department of Family and Community Medicine, University of Arizona College of Medicine. (2001). Health literacy: an important issue for communicating health information to patients. *Zhonghua Yi Xue Za Zhi (Taipei)*. , 64(11):603-8.
- Haas, L., & Maryniuk, M. (2014). National Standards for Diabetes Self-Management Education and Support. Retrieved February 9, 2017, from American Diabetes Association: *Diabetes Care*: http://care.diabetesjournals.org/content/37/Supplement_1/S144
- International Diabetes Federation. (2015). Diabetes scorecard in Nigeria. Retrieved from International Diabetes Federation: <http://www.idf.org/membership/afr/nigeria>
- Kim, H., & Lee, A. (2016). Health-Literacy-Sensitive Diabetes Self-Management Intervention: A Systematic Review and Meta-Analysis. *Worldviews Evidence Based Nursing*, 13(4), 324-333. <http://dx.doi.org/10.1111/wvn.12157>

Martin, L. R., Williams, S. L., Haskard, K. B., & DiMatteo, M. R. (2005). The challenge of patient adherence. *Ther Clin Risk Manag*, 1(3), 189–199.

Mendoza, M., & Rosenborg, T. (2013). Self Management of Type 2 Diabetes: A Good Idea or Not?. *The Journal Practice*, 62(5), 244–248.

Palumbo, R. (2015). Discussing the effects of poor health literacy on patients facing HIV: A narrative literature review. *International Journal of Health Policy and Management*, 4(7): 417–430. doi: 10.15171/ijhpm.2015.95.

Schulz, P. J., & Nakamoto, K. (2013). Health literacy and patient empowerment in health communication: the importance of separating conjoined twins. *Patient Education and Counseling*, 90(1), 4–11.

U.S. Department of Health and Human Services. (2016). Health Literacy and Health Outcomes. Retrieved from U.S. Department of Health and Human Services. Office of Disease Prevention and Health Promotion:
<https://library.sd.gov/LIB/DEV/training/institute/2016/files/Vacek-HealthLiteracyHealthOutcomes.pdf>

Khunti, K., Davies, M. and Kalra, S. (2013, January 29). Self-titration of insulin in the management of people with type 2 diabetes: a practical solution to improve management in primary care. Retrieved from Wiley Online Library:
<http://onlinelibrary.wiley.com/doi/10.1111/dom.12053/abstract?systemMessage=Wiley+Online+Library+Journal+subscribe+and+renew+pages+for+some+journals+will+be+unavailable+on+Wednesday+11th+January+2017+from+06:00-12:00+GMT+%2F+01:00-07:00+EST+%2F+14>

Safeer, R., Cooke, C., and Keenan, J. (2006). The impact of health literacy on cardiovascular disease. *Vascular Health and Risk Management*, 2(4): 457–464.

Wu, J.-R., Chung, M., Lennie, T. A., Hall, L. A., & Moser, D. K. (2008). Testing the psychometric properties of the Medication Adherence Scale in patients with heart failure. *Heart & Lung: The Journal of Acute and Critical Care*, 37(5), 334–343.

Zimmerman, B., Woolf, S., and Haley, A. (2015, September). Understanding the relationship between education and health. Retrieved from Agency for Healthcare Research and Quality:
<https://www.ahrq.gov/professionals/education/curriculum-tools/population-health/zimmerman.html>

Aikens, E., Piette, D. (2009). Diabetic patients' medication underuse, illness outcomes, and beliefs about antihyperglycemic and antihypertensive treatments. *Diabetes Care*, 32 (1), 19–24.

Binh, T., Phuong, P., Nhung, B. (2015). Knowledge and associated factors towards type 2 diabetes among a rural population in the Red River Delta region, Vietnam. *Rural And Remote Health*, 15 (3), 3275.

Broucke, S. V. (2016). Diabetes literacy. Enhancing the Effectiveness of Diabetes Self-Management Education. Retrieved February 9, 2017, from Final Report. Louvain-la-Neuve: Universite Catholique de Louvain: <http://cordis.europa.eu/docs/results/306/306186/final1-diabetesliteracyfinal.pdf>

Chinenye, Oputa, and Oko-Jaja, (2014). Diabetes and related diseases in Nigeria: Need for improved primary care in rural communities. *Journal of Health Science*, 2(2), April/June.

Center for Healthcare Strategies. (2013). Health Literacy. Retrieved February 9, 2017, from Fact Sheet 1: http://www.chcs.org/media/CHCS_Health_Literacy_Fact_Sheets_2013.pdf Diabetes Association of Nigeria. (2013). *Clinical practice guidelines for diabetes management in Nigeria*. Retrieved from Diabetes Nigeria: <http://diabetesnigeria.org/clinical-practice-guidelines-for-diabetes-management-in-nigeria/>

DeWalt, D., Berkman, N., Sheridan, S., Lohr, K., and Pignone, M. (2004). Literacy and health outcomes. *Journal of General Internal Medicine*, 19(12): 1228–1239. doi: 10.1111/j.1525-1497.2004.40153.x.

Department of Family and Community Medicine, University of Arizona College of Medicine. (2001). Health literacy: an important issue for communicating health information to patients. *Zhonghua Yi Xue Za Zhi (Taipei)*. , 64(11):603-8.

Haas, L., & Maryniuk, M. (2014). *National Standards for Diabetes Self-Management Education and Support*. Retrieved February 9, 2017, from American Diabetes Association: Diabetes Care: http://care.diabetesjournals.org/content/37/Supplement_1/S144

International Diabetes Federation. (2015). *Diabetes scorecard in Nigeria*. Retrieved from International Diabetes Federation: <http://www.idf.org/membership/afr/nigeria>

Kim, H., & Lee, A. (2016). Health-Literacy-Sensitive Diabetes Self-Management Intervention: A Systematic Review and Meta-Analysis. *Worldviews Evidence Based Nursing*, 13(4), 324-3333. <http://dx.doi.org/10.1111/wvn.12157>

Martin, L. R., Williams, S. L., Haskard, K. B., & DiMatteo, M. R. (2005). The challenge of patient adherence. *TherClin Risk Manag*, 1(3), 189–199.

Mendoza, M., & Rosenborg, T. (2013). Self Management of Type 2 Diabetes: A Good Idea or Not?. *The Journal Practice*, 62(5), 244-248.

Palumbo, R. (2015). Discussing the effects of poor health literacy on patients facing HIV: A narrative literature review. *International Journal of Health Policy and Management*, 4(7): 417–430. doi: 10.15171/ijhpm.2015.95.

U.S. Department of Health and Human Services. (2016). *Health Literacy and Health Outcomes*. Retrieved from U.S. Department of Health and Human Services. Office of Disease Prevention and Health Promotion:

<https://library.sd.gov/LIB/DEV/training/institute/2016/files/Vacek-HealthLiteracyHealthOutcomes.pdf>

Khunti, K., Davies, M. and Kalra, S. (2013, January 29). *Self-titration of insulin in the management of people with type 2 diabetes: a practical solution to improve management in primary care*. Retrieved from Wiley Online Library:

<http://onlinelibrary.wiley.com/doi/10.1111/dom.12053/abstract?systemMessage=Wiley+Online+Library+Journal+subscribe+and+renew+pages+for+some+journals+will+be+unavailable+on+Wednesday+11th+January+2017+from+06%3A00-12%3A00+GMT+%2F+01%3A00-07%3A00+EST+%2F+14>

Safeer, R., Cooke, C., and Keenan, J. (2006). The impact of health literacy on cardiovascular disease. *Vascular Health and Risk Management*, 2(4): 457-464.

Wu, J.-R., Chung, M., Lennie, T. A., Hall, L. A., & Moser, D. K. (2008). Testing the psychometric properties of the Medication Adherence Scale in patients with heart failure. *Heart & Lung: The Journal of Acute and Critical Care*, 37(5), 334-343.

Zimmerman, B., Woolf, S., and Haley, A. (2015, September). *Understanding the relationship between education and health*. Retrieved from Agency for Healthcare Research and Quality:

<https://www.ahrq.gov/professionals/education/curriculum-tools/population-health/zimmerman.html>.