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A REVIEW ON IMPACT OF SOCIAL DETERMINANTS ON MEDICATION ADHERENCE AND HEALTH RELATED QUALITY OF LIFE IN PATIENTS WITH HYPERTENSION AND DIABETES

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ABSTRACT

Over the decades much attention has been given to assessing the impact of medication adherence and the quality of life of patients suffering from chronic diseases. Medication adherence and Quality of Life are important tools for assessing disease outcome and treatment intervention outcomes. Patients with diabetes and hypertension, have lower QoL than other patients and should be prioritized during the planning of health services promotion. In this review, we have discussed the key factors such as education, income, occupation, age, gender and marital status and various barriers to non-compliance such as patient-related factors, health-related providers and aspects of the health care system. Understanding the importance of determining traits in patients with chronic diseases is important for health care providers. This review provides insights on inequalities in health status of population and reveals unmet needs in the community in implementing health policies.

Keywords: Chronic diseases, Diabetes, Hypertension, Medication adherence, Quality of life, Socio-economic status

INTRODUCTION

Diabetes mellitus (DM) is a rapidly growing metabolic disease that has become a major public health burden. The World Health Organization has identified DM as a

major disease that needs immediate attention around the world **[1]**. The International Diabetes Federation has reported that 463 million adults between the ages of 20-79 are living with diabetes and that the number will rise to 700 million by 2045 **[2]**. Diabetes can have a profound effect on work, sex, leisure, social and family life. The burden of disease control, complex and expensive medical procedures, dietary restrictions, and the need for insulin injections and blood and urine tests significantly affect quality of life **[3]**. In addition to increasing mortality, diabetes can lead to poor physical and mental health. Musculoskeletal and vascular complication adversely affects the quality of life (QoL) of patients with DM.

Hypertension affects about one billion people worldwide and is expected to increase by 29% to 1.56 billion by 2025 **[4]**. It is often undiagnosed, a chronic illness that requires lifelong treatment **[5]**. Although high blood pressure treatment is emerging in response to new drugs and published evidence, it is still poorly controlled in developed and developing countries **[6]**. In India, the incidence of hypertension is increasing dramatically. The overall coverage is estimated at 29.6% with regional diversity in rural areas (27.6%) and urban areas (33.8%). Control of hypertension between urban and rural parts of India is low (6.5% - 15% in rural areas and 11.6% - 28.7% in cities). A few studies have addressed the problem of non-adherence in Indian patients with high blood pressure **[7]**. To prevent the cardiovascular problems and DM-related fatal complications, controlling of blood pressure and blood glucose level is required. To achieve that goal, it is necessary to encourage patients to adhere to treatment, change their lifestyle, and follow the recommendations of their therapists **[8, 9]**. Many factors including patients' beliefs about health, illness, and treatment contribute to the treatment of adherence to diabetic and antihypertensive drugs **[10, 11]**. Studies involving outpatients reported that more than 50% did not adhere to proper medication administration and dosage **[12]**. It has been reported that patients with chronic diseases who adhere to their treatment may be better at QoL and vice versa **[13]**.

SOCIAL DETERMINANTS OF HEALTH (SODH)

Social health determinants are social and economic conditions divided into five factors. Health and health care, social and community environment, neighborhood environment, education, and economic stability **[14]**. Health and health care includes access to health care, access to primary care, health insurance provision, and health education **[15]**. The social and social contexts are the conditions in which

a person lives, studies, and works. Low mortality rates are associated with social support and solidarity. Neighborhood environment include housing, accommodation, transportation, access to healthy food, air quality, water quality, and access to green spaces. Immune function is influenced by stress. People living in poor areas are more stressed compared to those living in prosperous areas. The pressures of those living in poorer areas include, overcrowding, poor transportation, poor housing, limited services, poor infrastructure, and a lack of social support **[16]**.

Education includes high school graduation, enrollment in higher education, language and learning. The higher a person's level of education, the higher his or her lifespan. Economic stability includes employment, poverty, food security and housing stability. Unemployment affects a person's health in many ways, as it is associated with depression, domestic violence, substance abuse, and physical illness. Specific examples of SDOH include income, education, employment, and social support **[17]**. Differences in any of these conditions are interpreted in terms of socioeconomic status (SES) **[18]**. Five SDOHs play a major role in chronic diseases. For example, a person's level of education can affect his or her job, which determines economic stability and income level, which may affect the type of health care a person deserves and where one lives and social impact in which a person is surrounded. Therefore, one can conclude that aspects of economic well-being play an important role in infection and death.

In South Asia, chronic conditions (diabetes, high blood pressure and heart disease) occur at an early age, with devastating effects on longevity and quality of life **[19]**. Complications like kidney disease, diabetic retinopathy are often ignored and they have a very negative impact on a person's health **[20]**. Therefore, it is important to quantify the effect of chronic conditions on individual HRQOL.

HEALTH-RELATED QUALITY OF LIFE

Health-related quality of life (HRQOL) is a multidisciplinary concept that provides a broader view of health through the transfer of a person's ability to work in the physical, mental and social spheres of life. HRQOL is therefore an important patient-centered outcome measure that is helpful in directing health policies. HRQoL focuses on individual factors, such as financial status, level of education, occupation, emotional status (e.g., stress, anxiety, depression), physical health and social functioning in vulnerable people **[21]**.

HRQOL is related to patients' experiences, beliefs, expectations, and perceptions of the current level of performance, as well as

their satisfaction, compared to what they believe to be good **[22]**. We recognize that HRQOL combines positive and negative aspects of health. Negative factors include disease and malnutrition and positive factor includes feelings of mental and physical well-being, performance level, physical fitness, conditioning, etc. **[23]**. World Health Organization describes health as "a state of complete physical, mental and social well-being and not merely the absence of disease". This definition incorporates two widely accepted aspects of quality of life: modesty and diversity **[24]**.

Several studies indicate that HRQOL is a predictor of survival in some diseases and patients. The results of the study show a high correlation between social reporting and health status. Wellness, morality and QOL as a whole have long been associated with good levels of physical and mental functioning and health status.

SF-36 is a modern HRQOL index and is widely used. Tests can be completed by both patients and the negotiating team. It measures 8 scales with 36 objects. It incorporates measures previous indicators pluse- vitality, mental health and general health. The test results are calculated into two sub-measures showing different physical and mental functioning. Results are 0-100 with high scores showing good health. SF-36 is intended to measure HRQOL factors that may be associated with any disease at any age or social group - especially physical, emotional, and social functioning **[25]**.

MEDICATION ADHERENCE

Adherence is defined as "the active, voluntary, and participation of a patient in an acceptable behavior in order to produce a therapeutic effect. Adherence to medication is a multi-faceted problem and consists of three components: initiation, implementation, and persistence.

CAUSES OF POOR ADHERENCE

Improper adherence to treatment severely impairs patient outcomes and increases mortality. According to the WHO, improving treatment adherence to conditions of hypertension, hyperlipidemia, and diabetes will bring far greater health and economic benefits. In order to improve adherence, causes of diminished adherence should always be understood. WHO classifies these factors into 5 categories: social and economic factors, health team-related factors, disease-related factors, treatment-related factors, and patient-related factors. In general, these factors fall into patient related factors, physician-related factors, and features related to the health system.

Patient Related Features

A number of patient-related factors, including a lack of understanding of their illness, lack of involvement in treatment

decision making **[26]** and incomplete medical knowledge, and the impact of drug overdose. The patient's health beliefs and attitude towards treatment success, his or her prior knowledge of medication, and lack of motivation also affect the level of medication adherence **[27]**. Medication adherence continues to decline even after a traumatic event such as a stroke and, therefore, it is not surprising that treating untreated conditions to prevent the occurrence of adverse events many years later presents an even greater challenge.

Socio-economic factors

Certain factors identified as barriers to drug adherence among rural patients with low economic status were high drug costs, lack of transportation, poor understanding of medication instructions, and long waiting times at the hospital **[28]**. Lack of family or community support also predicts inconsistencies such as dementia **[29]**. These findings are clinically important for patients with CVD and diabetes because studies have shown that stress and anxiety are common in patients with coronary artery or stroke and altered glucose levels **[30]**. Depression is a major cause of poor outcomes in depressed patients when there are chronic diseases and associated with poor adherence **[31]**.

Physician-Related Factors

Physicians often fail to recognize the adherence of medication to their patients; they may also be involved in providing complex drug regimens, failing to explain the benefits and side effects of the drug effectively, and failing to adequately consider the financial burden on the patient. Ineffective communication between a primary care physician and a patient with a chronic illness such as CVD and diabetes further undermines a patient's understanding of his or her condition, potential complications, and the importance of adherence to medication. Failure to obtain a history of alternative therapies, medications, or supplements is another source of communication dysfunction. Communication between physicians is often inadequate and may contribute to drug non adherence **[32]**.

Health System / Team Building - Related Features:

Different health care systems create barriers to adherence by reducing the association of health care and patient access to care **[33]**. Short-term medication costs or fees also contribute to reduced effective adherence **[34]**. Health information technology is widely available, preventing physicians from easily accessing information from a variety of patient-related settings, which also jeopardizes patient care, timely refinement of medications, and physician-patient interactions. In a tax-exempt health care system where physicians see a large

number of patients without resources to meet the needs of each patient, the time the clinician spends with patients may not be enough to properly assess and understand their medication behavior. This lack of time may prevent the patient from engaging in discussions about the importance of adherence and strategies for success.

STRATEGIES FOR IMPROVING MEDICINE DELIVERY

Patient Related Features

Adherence to medication is primarily in the patient's domain. Because patients remember less than 50% of what was discussed during a doctor's appointment **[35]**. Effective patient education should be multidisciplinary, individual, and delivered in a variety of ways and settings outside the examination room. In patients with high blood pressure and diabetes, education for both the patient and the physician was associated with improved control compared with physician education alone **[36]**. Systemic health education programs, such as self-management and diabetes education, can work **[37]**. In the absence of a formal program, physicians will emphasize the availability of other educational resources, including pharmacists, public health programs, and web-based collaborators.

Similarly, a physician should avoid prescribing too many medications and changes in behavior at the same time, as this may discourage the patient. If it is necessary to give more than one medicine, a very important reason should be given **[38]**.

Many patients with basic medical knowledge may not be able to read a prescription or a warning of toxicity **[39]**. Possible solutions to a patient's poor reading ability include providing the patient with visual and audio-visual aids instead of written instructions. Topics available in many languages include coronary artery disease, diabetes, high blood pressure and stroke.

Diagnosis and treatment of mental illness should be a priority when treating patients with chronic conditions such as CVD and diabetes. Consideration of the economic status of patients is very important. By recognizing that patients' economic barriers will limit their ability to adhere to their medication, a physician may be able to guide patients through financial assistance programs. Such programs include pharmaceutical-based support programs, government-based support programs, and pharmacies that supply 30 days of comprehensive prescription drug products, including many of those commonly offered to patients with low-cost drugs.

Physician-Related Factors

Improvements in patients' adherence were reported in patients who had a good relationship with their physician. Effective communication is the key to good relations

between doctors and patients. Physicians should follow a patient-centered approach to care that promotes active patient involvement in the decision-making process in order to increase medication adherence. The physician must consider patients' cultural beliefs and attitudes.

Behaviors of impatient patients are less likely to adhere to long-term medications. It is suggested that instead of trying to change the behavior of those who are "impatient," it may be wise to set priorities for the patient, especially since they are associated with immediate benefits compared to long-term. For example, advising patient that taking prescribed medication for diabetes can reduce problems such as diabetic retinopathy and the development of visual acuity.

An important part of a successful doctor-patient relationship is the creation of a positive, "innocent" environment, in which patients are commended for achieving treatment goals and given "permission" to faithfully answer any questions related to their treatment.

By asking the right questions, physicians can accurately assess what medications patients are taking and how they are taking it. Asking if patients are "balancing" or "sharing" their medications for financial or other reasons.

Defining a maximum number of possible side effects, limiting the frequency of visits to the pharmacy, and informing the patient's economic status by adhering to their medication plan improves adherence by reducing economic barriers.

An increase in the number of pills taken per day may reduce their adherence **[40]**. To help combat polypharmacy-related adherence, physicians should consider prescribing combination dosage pills if possible. Data suggest that adherence to multiple antihypertensive treatments and lipid-lowing therapy is improved when using multiple-pill regimens **[41]**. Once-daily dosing regimens may be better because reducing the frequency of dosing has been shown to improve adherence.

Complex therapies are often associated with reduced adherence. Doctors would be wise to prescribe medication that could be taken at the same time of the day. When prescribing new medicines, the doctor should give the patient all the necessary and important information, including the name of the drug; its purpose (e.g., lowering BP); dosing frequency (e.g., once a day); how long it should be taken (e.g., 1 year or life); and any potential side effects, their chances of occurrence, that they will resolve without intervention, and how the treatment plan may change if not resolved.

Using a back-up approach, that is, asking patients to repeat key points in order to read and explain a medication label are ways in which a physician can ensure that patients

understand all aspects of their medication, which in turn increases adherence **[42]**.

Health Care System-Related Features

The health care system in which the physician works is critical to achieving the ultimate goal of improving the patient's health because adherence to medication is an important factor in improving a patient's health. Health care system changes are needed to ensure that adequate time is allocated to discuss adherence factors **[43]**.

The team-based approach involves training non-medical staff to perform tasks that are usually completed by physicians, thus giving the physician more time to discuss patient adherence patterns. Other features of the team-based approach to health care include careers' and pharmacy staff negligence, drug-based patient education, call reminders, web-based tools, and case management presentations **[44]**.

Medication management services, provided by insurance retailers to community pharmacists are designed to provide education and counseling to improve a patient's understanding of his or her medication, improve adherence to medication. Preliminary studies show that patient participation in medication therapy management service (MTMS) programs improves adherence and patient outcomes **[45]**. Therefore, physicians should encourage eligible patients to participate in MTMS programs. Increased use of electronic medical records and electronic delivery increases adherence by identifying patients at risk of disobedience and directing them to intervene. Increased use of electronic records may delay the completion of the prescription, which can be overcome by allowing the physician to intervene and prevent poor adherence.

Starting long-term medication during hospitalization for acute event while hospitalized is thought to improve adherence because patients and their caregivers focus on cardiovascular risk and how it can be reduced during this “learning period **[46]**.

Medication interactions studies improve medication adherence, as well as patient safety. Medication reconciliation is the process of creating the most accurate list of all the medications a patient is taking, including drug name, dose, frequency, and dosage, and comparing that list against acceptance, transfer, and / or withdrawal instructions. These lists of personal medications are especially important for patients with chronic conditions such as CVD and Diabetes, often requiring the use of multiple medications.

CONCLUSION

Adherence problems are common in patients taking antihypertensive and diabetes drugs and are associated with increased risk of micro vascular, coronary and cerebrovascular events. Failure to

adhere strictly to the health system is a major problem not only affecting the patient but also the health care system. Improper adherence to medication in patients leads to significant increases in morbidity, mortality and increased cost of health care. Due to the negative effects of social decisions such as the state of the economy in QoL, funding programs should be among the most important factors in patients' QoL development programs. Organized social inequalities and socio-economic inequalities (SES) contribute to high incidence of diabetes, CVD, high blood pressure in many people. Awareness of these factors can assist providers in identifying vulnerable people and directing new interventions to improve the care of these communities. QOL for chronic patients requires further research to answer a variety of questions, such as: how and how diseases affect QOL for patients and how. Does improving chronic patients QOL reduces the symptoms of the disease and what features and interventions affect QOL for chronic patients.

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REFERENCES

[1] WHO. Global report on Diabetes. 2016 [cited 1 November 2018]. In: World Health Organization. http//www.apps.who.int/iris/bitstream/10665/204871/st1/9789241565257_eng.pdf

[2] International Diabetes Federation. Diabetes facts & figures. 2020 [cited 12 February 2020]. In: International Diabetes Federation. https://www.idf.org/aboutdiabetes/what-isdiabetes/facts-figures.html

[3] Darvishpoor KA *et al*, Instrument development to measure diabetic clients quality of life (DCQOL), Iran J Endocrinol Metab, 7(2), 2005, 149-155.

[4] Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J, Global burden of hypertension: analysis of worldwide data, Lancet, 365(9455, 2005, 217-23.

[5] Kale S, Patil A, Mandlecha RH, Compliance and adverse drug effects of antihypertensives in rural India, J Clin Diagn Res, 5(4), 2011, 775-9.

[6] Anchala R *et al*, Hypertension in India: a systematic review and meta-analysis of prevalence, awareness, and control of hypertension, J Hypertens, 32(6), 2014, 1170-7.

[7] Santra G, Assessment of adherence to cardiovascular medicines in rural population: an observational study in patients attending a tertiary care hospital, Indian J Pharmacol, 47(6), 2015, 600-4.

[8] Garcia-Perez LE, Alvarez M, Dilla T, Gil-Guillen V, Orozco-Beltran D, Adherence to therapies in patients with type 2 diabetes, Diabetes Ther, 4, 2013, 175-194.

[9] Biradar SS, Rajashekhar K, Srinivas R, Raju SA, Assessment of pharmacist mediated patient counseling on medication adherence in hypertension pateints of south Indian city, Int Res J Pharm, 3, 2012, 251-5.

[10] Horne R *et al*, Understanding patients' adherence- related beliefs about medicines prescribed for long-term conditions: a meta-analytic review of the necessity-concerns framework, PLoS One, 8(12), 2013, ID e80633.

[11] Marshall IJ, Wolfe CDA, McKevitt C, Lay perspectives on hypertension and drug adherence: systematic review of qualitative research, BMJ, 345, 2012, 3953.

[12] Tavares NU *et al*, Factors associated with low adherence to medicine treatment for chronic diseases in Brazil, Rev Saude Publica, 50, 2016, 10s.

[13] Pratama IPY, Andayani TM, Kristina SA, Knowledge, adherence and quality of life among type 2 diabetes mellitus patients, Int Res J Pharm, 10, 2019, 52-55.

[14] USDHHS, Social Determinants of Health.Washington, DC (2020).

[15] AMA, Social Determinants of Health, Health Systems Science Learning Series. Chicago, IL (2020).

[16] Algren MH, Ekholm O, Nielsen L, Ersboll AK, Bak CK, Andersen PT, Associations between perceived stress, socioeconomic status, and health-risk behaviour in deprived neighbourhoods in Denmark: a cross-sectional study, BMC Public Health, 18, 2018, 250.

[17] Chapman AR, The social determinants of health, health equity, and human rights, Health Hum Rights, 12, 2010, 17–30.

[18] Lowcock EC, Rosella LC, Foisy J, McGeer A, Crowcroft N, The social determinants of health and pandemic H1N1 2009 influenza severity, Am J Public Health, 102, 2012, e51–8.

[19] Prabhakaran D, Jeemon P, Roy A, Cardiovascular diseases in India: current epidemiology and future directions, Circulation, 133, 2016, 1605–20.

[20] Schultz SE, Kopec JA, Impact of chronic conditions, Health Rep, 2003;14:41–53.

[21] Kil SR *et al*, The Decline of Health-Related Quality of Life Associated with Some Diseases in Korean Adults, J Prev Med Public Health, 41, 2008, 434.

[22] Megari K, Quality of life in chronic disease patients, Health Psychol Res, 1(3), 2013, e27.

[23] Ware JE, Gandek B, Allison J, The validity of disease-specific quality of life attributions among adults with multiple chronic conditions, Int J Stat Med Res, 5(1), 2016, 17–40.

[24] Ferrans CE, Definitions and conceptual models of quality of life, Outcomes assessment in cancer: Measures, methods, and applications, 14–30, 2005. https://psycnet.apa.org/record/2005-07140-002,

[25] Shi H *et al*, Comparison of health-related quality of life (HRQoL) between ileal conduit diversion and orthotopic neobladder based on validated questionnaires: A systematic review and meta-analysis, Qual Life Res, 27, 2018, 2759–2775.

[26] Haynes RB, McDonald HP, Garg AX, Helping patients follow prescribed treatment: clinical applications, JAMA, 288(22), 2002, 2880-2883.

[27] Joyner-Grantham J *et al*., Self-reported influences of hopelessness, health literacy, life style action, and patient inertia on blood pressure control in a hypertensive emergency department population, Am J Med Sci, 338(5), 2009, 368-372.

[28] Kripalani S, Henderson LE, Jacobson TA, Vaccarino V, Medication use among inner-city patients after hospital discharge: patient-reported barriers and solutions, Mayo Clin Proc, 83(5), 2008, 529-535.

[29] Molloy GJ, Perkins-Porras L, Bhattacharyya MR, Strike PC, Steptoe A, Practical support predicts medication adherence and attendance at cardiac rehabilitation following acute coronary syndrome, J Psychosom Res, 65(6), 2008, 581-586.

[30] Amin AA, Jones AM, Nugent K, Rumsfeld JS, Spertus JA, The prevalence of unrecognized

depression in patients with acute coronary syndrome, Am Heart J, 152(5), 2006, 928-934.

[31] Frasure SN, Lespérance F, Depression and anxiety as predictors of 2-year cardiac events in patients with stable coronary artery disease, Arch Gen Psychiatry, 65(1), 2008, 62-71.

[32] Kripalani S *et al*., Deficits in communication and information transfer between hospitalbased and primary care physicians: implications for patient safety and continuity of care, JAMA, 297(8), 2007, 831-841.

[33] Gordon K, Smith F, Dhillon S, Effective chronic disease management: patients' perspectives on medication-related problems, Patient Educ Couns, 65(3), 2007, 407-415.

[34] Kennedy J, Tuleu I, Mackay K, Unfilled prescriptions of medicare beneficiaries: prevalence, reasons, and types of medicines prescribed, J Manag Care Pharm, 14(6), 2008, 553-560.

[35] Schillinger D *et al*., Closing the loop: physician communication with diabetic patients who have low health literacy, Arch InternMed, 163(1), 2003, 83-90.

[36] Roumie CL *et al*., Improving blood pressure control through provider education, provider alerts, and patient education: a cluster randomized trial, Ann Intern Med, 145(3), 2006, 165-175.

[37] Balamurugan A *et al*., Diabetes self-management education program for Medicaid recipients: a continuous quality improvement process, Diabetes Educ, 32(6), 2006, 893-900.

[38] Praska JL, Kripalani S, Seright AL, Jacobson TA, Identifying and assisting low-literacy patients with medication use: a survey of community pharmacies, Ann Pharmacother, 39(9), 2005, 1441-1445.

[39] US Department of Health and Human Services, National Institutes of Health. Clear communication: an NIH health literacy initiative. Bethesda, MD: National Institutes of Health; 2010. http://www.nih.gov/clearcommunication/. Accessed November 15, 2010.

[40] Benner JS, Chapman RH, Petrilla AA, Tang SS, Rosenberg N, Schwartz JS, Association between prescription burden and medication adherence in patients

initiating antihypertensive and lipid-lowering therapy, Am J Health Syst Pharm, 66(16), 2009, 1471-1477.

[41] Hussein MA *et al*., Does a single-pill antihypertensive/ lipid-lowering regimen improve adherence in US managed care enrolees? A non-randomized, observational, retrospective study, Am J Cardiovasc Drugs, 10(3), 2010, 193-202

[42] Tarn DM *et al*., Physician communication when prescribing new medications, Arch Intern Med, 166(17), 2006, 1855-1862.

[43] Abbo ED *et al*., The increasing number of clinical items addressed during the time of adult primary care visits, J Gen Intern Med, 23(12), 2008, 2058-2065.

[44] Medicare Prescription Drug, Improvement, and Modernization Act of 2003, Pub Lone, 108-173, 117 Stat 2066.

[45] Planas LG, Crosby KM, Mitchell KD, Farmer KC, Evaluation of a hypertension medication therapy management program in patients with diabetes, J Am Pharm Assoc (2003), 49(2), 2009, 164-170.

[46] Fonarow GC, In-hospital initiation of statins: taking advantage of the 'teachable moment' [editorial], Cleve Clin J Med, 70(6), 2003, 502-506.