ISSN 2692-5877
DOI: 10.46998/IJCMCR.2023.30.000728

International Journal of
Clinical Studies & Medical Case Reports

Review Article

Prevention of Diseases Through Lifestyle Medicine Strategies – A Boon to the Economic Development of any Nation

Bala Chandar JC[1,*], Jayachandran M[1,2], Amit Kumar Agrawal[3] and Irshad Ahamed S[4]

[1]*CEO, Dr. Bala's School of Fitness & Preventive Medicine, Faridabad, India*

[2]*Dean, Research and Development Center, Sethu Institute of Technology, India*

[3]*IAS, Additional Principal Secretary to the Chief Minister of Haryana, Director General-Information, Public Relations, Languages & Culture, India*

[4]*General Surgery and Laparoscopic Surgeon, Senior Resident, Department of General Surgery, Pondicherry Institute of Medical Sciences, India*

***Corresponding author:** Bala Chandar JC, CEO, Dr. Bala's School of Fitness & Preventive Medicine, Faridabad, Delhi-NCR, India

Received: May 23, 2023 **Published:** September 18, 2023

Abstract

The cost and expense of pharmaceuticals are rising at a rapid pace throughout the world, putting a significant commitment and heavy strain on every government's health-care budget and implementation. The Lifestyle Medicine (LM) strategies and techniques are critical for influencing and controlling the underlying causes of the escalating chronic illness burden. Rather than restricting resources and medical expenditures on acute treatment and reacting to illness, damages and diseases, lifestyle medicine targets health risk factors taking a 360 degree in primary, secondary and tertiary prevention of disease development and propagation. The majority of health-care expenditures go towards sickness treatment, with less attention towards preventive medicine based on the lifestyle medicine pillars like scientific exercises, right diet, avoiding smoking/alcohol, precise sleep pattern & mindfulness etc. Nonetheless, there is abundance wealth of data supporting the efficacy of lifestyle medicine and the value of behavioral health in the management of a wide range of health risks and incurable medical diseases. Physical activity/scientific exercises, weight control, and nutrition/diet programmes are used in lifestyle medicine treatments to prevent, treat and reverse chronic diseases such as cardiovascular disease, cancer and diabetes mellitus among others. These techniques have proven ability to lower health care cost trends and a nation's health care budget all together. Consequently, they raise citizen performance/productivity, improve individual patient health outcomes, and ultimately play a far-reaching vital role in a nation's sustained economic growth.

Introduction

To Improve population health, to enhance/promote patient experience, to reduce healthcare costs, to nurture better work life, and to minimize burnout among healthcare personnel through programmed value-based care models must be the key goods of any health care budget. Aside from reducing quality of life and increasing mortality, ill health of a person has high individual costs [1]. Studies have broadly examined how economic status of an individual and the physical activity levels along with the eating habits of a human being has influenced the noncommunicable chronic illness status and their medical expenses [2]. Thus, Lifestyle Medicine (LM) has shown immense potential in improving the health status of an individual and reducing the healthcare costs, albeit such economic consequences have yet to be deeply studied and quantitatively measured [3]. By improving population health, improving patient experience, reducing healthcare costs, and improving provider well-being, the Quadruple Goal (QG) optimizes health system performance [4]. A referral and personal introduction to the research team led to identification of two cases of disease reversal and associated changes in healthcare costs. The present case series demonstrates the efficacy of Intensive Therapeutic Lifestyle Change (ITLC), which includes a predominantly WFPB DIET (whole food plant-based diet) in many cases combined with physical activity, in promoting chronic disease prevention and reducing the need for medication, ultimately promoting each of the four elements of the quadruple aim. Exhibits the efficacy of Intense Therapeutic Lifestyle Modification (ITLC) when utilized in conjunction supported this case series demonstrates the potency of ITLC in driving illness remission and supports further study on the possible economic benefits of a lifestyle medicine approach owing to cost avoidance. It should be mentioned here, however, that one drawback of this case series is being pooled from information gathered from patients by self-report [5].

A study arm that incorporates lifestyle modifications, which are frequently the core of clinical guidelines for noncommunicable chronic illness might enhance this type of research. The majority of current clinical comparative effectiveness research

Copyright © All rights are reserved by Bala Chandar JC*, Jayachandran M, Amit Kumar Agrawal and Irshad Ahamed S

studies compare drugs and treatment regimens only. Finally, information on consumer level cost savings, such as lower expenses of reduced prescriptions consumed, operations/surgeries avoided, and/or less frequency of medical appointments over time, might help consumers make better decisions about adopting healthy lifestyle behaviors. As a result, the following is a review of important research goals required to develop the discipline of Lifestyle medicine by enumerating the advantages of Lifestyle medicine therapies for health outcomes as well as investigating possible favorable economic impacts. Many countries have recognized the importance of lifestyle medicine priority and its contribution to the successful start, implementing and finally achieving the quadruple goal. [6].

(a) To appropriately quantify the impact of ITLC treatments on chronic illness health outcomes, we have to conduct carefully structured research, including randomized controlled trials (RCTs) wherever applicable. Documenting the outcomes of ITLC interventions in peer-reviewed research is the first step towards quantifying the economic benefits realized and establishing a case for incorporating Lifestyle Medicine inter worn with conventional medical practice and shaping standards of societal care (improved population health; patient personal experience) [7].

(b) Establish the cost and value of altered lifestyle expenses other than medical care and in comparison, to medical care, such as grocery costs and educational awareness programmes, as well as intangible factors such as decreased absenteeism in the workplace consequently increased productivity, enhanced life satisfaction, and better quality of life. These findings should be considered in future research to properly highlight the usefulness and impact of Lifestyle Medicine-based therapies. [8].

(c) Assess the impact of lifestyle medicine practice on provider burnout. Despite the fact that provider burnout is common, LM providers indicate that participation in LM-lifestyle medicine practice has considerably lowered their degrees of burnout as well. Provider burnout is closely linked to increased medical mistakes, decreased patient safety, reduced productivity, and higher healthcare expenses. Improving the work experience of a healthcare provider can reduce burnout and enhance patient satisfaction and health outcomes, which LM can address i.e improved well-being; lower healthcare expenditures [9].

(d) Model the potential economic cost reductions afforded by health improvements as a result of lifestyle changes vs traditional illness progression and care. While characterizing medical expenditures is difficult, for some illnesses, typical yearly healthcare spending was measured, allowing prospective savings for the patient and/or private health insurance or Medicare/Medicaid to be extrapolated [10].

(e) Calculate real healthcare expenses, such as those per member per month, in a broader cohort of insured people, comparing those who are exposed to Lifestyle Medicine therapies to those who are not. The true purpose of economic research on Lifestyle Medicine therapies should be to track actual costs and savings over time. One framework for investigating these comparisons would be achievable with the leadership of an insurance carrier to establish a Life style Medicine provider network, with insured persons randomly assigned to either the Life style Medicine network or a regular, non-Life style Medicine network. Specific patient outcomes from individuals who saw a physician within a certain time period might be compared. (Lower healthcare expenses) [11].

(f) Investigate the implications of lifestyle medicine implementation on various payment structures. Accountable Care Organizations, private pay, employer-sponsored healthcare concierge, Medicare, Medicaid, or pay per service may all have incentives and impediments to Lifestyle Medicine adoption that may be recognized and measured. Different payers have different demands, and the services they get may have varied effects on their bottom line. (Lower healthcare expenses) [12].

Rather than restricting resources and medical expenditures on acute treatment and reacting to illness, damage and disease, lifestyle medicine targets health risk factors in primary, secondary, and tertiary prevention of disease development. Employers stand to benefit financially from such a strategy since they are the payers of their workers health care bills as well as the recipients of productivity increases among their employees. This article addresses Workplace Lifestyle Medicine programmes, including crucial findings from Dr.Bala's School of Fitness & Preventive Medicine in Faridabad, Delhi-NCR, India. Examples of population-based evidence on the impact of Physical activity/scientific exercise, weight control, and nutrition/diet programs that target and prevent chronic illnesses such as cardiovascular disease, cancer, and diabetes mellitus are summarized as Lifestyle Medicine interventions [13]. Fig-

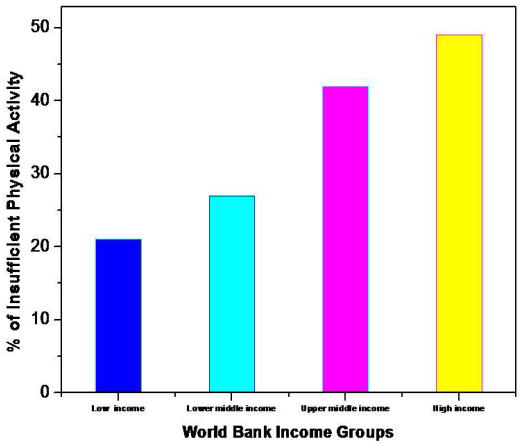

Figure 1: Relationship between wealth and level of physical activity, 2011. Physical inactivity levels by World Bank income group.
Source: Modified from WHO 2011a. Physical inactivity levels and GDP/capita in the Indian Region

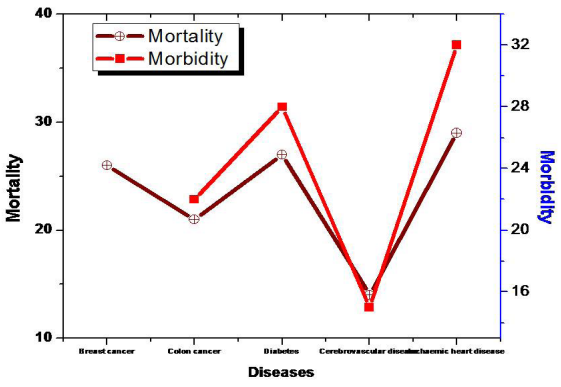

Figure 2: Mortality, morbidity and share of the burden of disease attributable to Physical inactivity for major non communicable diseases in the North Indian Region, 2021(both sexes).
Source: Authors' analysis on WHO 2021.

ure 1 depicts the relationship between wealth and amount of physical exercise.

The majority of health-care expenditures go towards chronic sickness treatment, with less focus and spending towards preventive and Lifestyle Medicine (LM). Nonetheless, there is a wealth of research data supporting the effectiveness of LM and the relevance of behavioral health in the management of a wide range of health hazards and medical disorders. We created a technique to discover the de-identified persons most likely to acquire diabetes using our longitudinal database. The capacity of all working men and women to give incentives to join and remain in health and wellness efforts to improve health conditions have been clearly provided by the Affordable Care Act. [14].

Figure 2 depicts how physical inactivity in the workplace might result in both Mortality and Morbidity for illness in diverse men and women. Similarly, therapeutic strategies incorporating lifestyle behavior adjustment in individuals with various disorders indicated have resulted in significant health gains. These are potential techniques to address the chronic illness pandemic and rising healthcare expenses in North Indian areas [16].

Chronic disease imposes a significant cost burden on both patients and the healthcare system, and current fee-for-service healthcare models prioritize symptom treatment, drugs, and procedures over addressing the core causes of disease through behavioral changes. Value-based care is gaining popularity, and there is a need for value-based care models that fulfil the quadruple goal of (a) improved population health, (b) improved patient experience, (c) lower healthcare costs, and (d) improved work life and less burnout among healthcare personnel. Lifestyle medicine (LM) has the ability to fulfil these four goals, which include boosting health and wellbeing and lowering healthcare expenses, which will certainly lead to economic growth [17].

Investing in lifestyle medicine strategies and disease prevention

The economic argument for investment in noncommunicable disease prevention and health promotion is greater than it has ever been. The leading cause of mortality and disability is chronic noncommunicable illnesses. However, the key risk factors for chronic illnesses are mostly avoidable. A high illness burden, particularly from chronic noncommunicable diseases, has a significant influence on labor markets and productivity across the world. Disparities in work chances and salaries are exacerbated by diseases. They have an impact on workplace productivity, sick leave, and the need for social assistance. Poor health in childhood can have long-term implications, restricting educational achievement and employment chances as well as negatively impacting health. In many nations, health expenditure has outpaced economic development, resulting in elevated financial constraints that jeopardize the long-term sustained viability of health-care systems. Expensive medical treatments can enhance people's quality of life significantly, but they also raise the expense of maintaining many chronic conditions. As a result, it is critical to examine population-wide lifestyle medicine strategies that can help lower the likelihood of hike in disease numbers. There are compelling economic issues and health reasons to invest in health promotion and disease prevention. Furthermore, there are externalities linked with the negative effects of preventable bad health that harm families and might place a pressure on public resources. Global health care systems have to address significant problems regionally in promoting and safeguarding community health at a time when availability of finances and resources are under severe strain in many nations [18].

Minimizing the risk of chronic illnesses and injuries by treatments focused at changing lifestyle risk factors is feasible and cost-effective, and it has the potential to minimize health disparities within a nation. To reverse and eradicate the tide of chronic health issues that have reached epidemic proportions during the twentieth century, significant adjustments and tolerance in the social norms that govern individual and group behavior are required. Such shifts can only occur if governments initiate and encourage broad-based preventative efforts that address many health variables across various socioeconomic groupings [19].

Cardiovascular Disease (CVD)

Poor lifestyle choices concerning nutrition, physical activity, alcohol use, sleep, psychological stress, and smoking have been clearly linked to the development of CVD, with therapies that improve these lifestyle choices being linked to improved clinical results. A dose-response association exists between physical activity levels and the risk of heart disease, diabetes, and high blood pressure. Despite this, only 15% of individuals engage in regular strenuous physical activity or a scientific exercise programme. [20].

Diabetes Mellitus

Adults with diabetes have about double the prevalence of CVD as the general population. Adults with type 2 diabetes mellitus require behavioral health therapies that target food improvement, cigarette cessation, and physical activity/scientific exercises to achieve optimal disease management. The outcomes of such lifestyle changes have been linked to decrease CVD incidence and death in diabetic individuals [21].

Cancer

Overweight, obesity, and cigarette use have all been linked to an increased risk of various malignancies. Smoking cessation and avoiding passive smoke have been linked to cancer prevention and risk reduction. D.W. Edington et al. recently examined the status of diets and dietary supplements in the prevention and treatment of cancer. Diets high in whole grains, fruits, and vegetables have been linked to a decreased risk of cancer. Whole grain, fruit, and vegetable-rich diets have been linked to a decreased risk of cancer. Various dietary supplements have not been linked to any advantages in cancer prevention studies. In general, research have verified the recommendations for all individuals to avoid obesity, treat obesity, and encourage a healthy diet. Such advice is given to cancer survivors in order to lessen the incidence of secondary malignancies and cancer recurrences. Lifestyle therapies for cigarette cessation, nutrition, and obesity are obviously therapeutically significant in cancer prevention [22].

Preventable Non-Communicable diseases (NCDs) which puts excess pressure on health Care Budget

Noncommunicable illnesses are not contagious and so do not spread like communicable diseases. The majority of NCDs are chronic and continue for a long time. NCDs account for around 71% of worldwide mortality and place significant strain on any country's health-care budget. Cardiovascular illnesses, cancer,

respiratory disorders, and diabetes are the four leading causes of mortality in the United States. NCDs can be caused by both hereditary and environmental causes. As a result, several of them are also referred to as lifestyle illnesses. Poor nutrition, lack of exercise, insufficient sleep, smoking, alcohol use, and stress are the most common risk factors for NCDs.

Connection between Lifestyle & Non communicable diseases
Noncommunicable Diseases (NCD) include lifestyle illnesses such as hypertension, diabetes, cancer, heart disease, and stroke. This includes mental health disorders such as trauma and depression. Most NCDs are caused by a combination of physiological causes, as well as poor nutrition and activity. Blood pressure, cholesterol, blood glucose, hyperlipidemia, overweight or obesity, behavioral variables, sedentary lifestyle, unbalanced food, stress, cigarettes, and alcohol are examples of physiological factors. These risk factors affect people of all ages, genders, and regions. The behavioral aspects in this case are changeable with appropriate lifestyle adjustments [23].

Some action Plans by the Government
Efforts to encourage healthy eating are especially cost-effective when implemented at the grass root population level rather than at the level of health care services. Processed food reformulation to reduce salt and saturated fat (Tran's fat, in particular) is a low-cost intervention that may be undertaken through multi-stakeholder agreements. Fiscal measures (such as taxes and subsidies) and control of food advertising to children are both low-cost and cost-effective. However, practicality may be hampered by competing interests. Programmes to raise knowledge and information, such as mass media campaigns and food labelling programmes, are also effective investments, although with lesser efficacy, especially in lower socioeconomic groups. Promoting physical activity/regular scientific exercises through mass media campaigns is a very cost-effective and low-cost action. However, the returns on health outcomes may be smaller than those given by more targeted interventions, such as those implemented in work environments. [24].

Changes to the transportation system and improved access to chances for physical exercise in the wider environment, such as the creation of bicycle paths, offer potential economic advantages as well, but must be carefully evaluated to determine affordability and practicality. When compared to efforts aimed at children and young people, actions aimed at the adult population and persons at higher risk tend to create stronger impacts in a shorter timeframe. Strong evidence suggests that preventing depression, the biggest cause of disability worldwide, is both possible and cost-effective. Depression is connected with premature death and decreased family functioning, as well as huge economic expenses owing to health-care and productivity losses, which can be averted in part by adequate prevention and early identification [25]. Evidence supports activities across the life course, beginning with early childhood actions to build social and emotional learning, coping abilities, and stronger relationships between parents and children, which can have long-term effects. There are also low-cost projects aimed towards high-risk groups such solitary older persons and new moms.

Conclusion

Given the prevalence of negative externalities from unhealthy lifestyle and the scarcity of knowledge, the case for government action to encourage healthy lifestyle is very compelling. A increasing body of data from economic research demonstrates effective lifestyle medicine policies/strategies may promote health and other advantages at a reasonable cost, often lowering health spending while also helping to address health inequities. There is evidence from controlled trials and well-designed observational studies on the effectiveness of a wide range of health promotion and disease preventive programmes that address risk factors for health. These include steps to lower the risk of smoking and alcohol use, enhance physical activity/scientific exercises, and encourage healthier diets, as well as safeguard psychological and emotional well-being. There is a robust economic evidence foundation for health promotion and disease prevention. The task now is to build on this evidence foundation and consider how it may be utilized to integrate evidence-based knowledge into ordinary and adoptable everyday practice throughout the world/countries.

Governments across the globe must collaborate to implement a simple and effective programme based on lifestyle medicine techniques with the goal of improving public health and providing the congenial environment for economic growth and development. People's health and life expectancy will be improved, health care systems will be relieved of a significant portion of the burden of treating chronic diseases, the economy will benefit from a healthier and more productive workforce, and society will enjoy greater welfare and fairer health outcomes by shaping environments based on lifestyle medicine and conducive to healthier consumption choices.

This case study demonstrates substantial gains in physical health and quality of life as a result of lifestyle changes, namely a switch to a WFPB diet & regular scientific exercise regime and the emerging research areas include LM treatments and clinical outcomes, economic consequences, comparative efficacy, and effect sizes. Although case studies provide weaker evidence than other study designs in the research evidence hierarchy, these self-reported accounts provide a promising foundation for illustrating what may be possible for some individuals who engage in ITLC-intensive lifestyle change, justifying the research priorities outlined here to advance the quadruple aim and optimize health system performance which will lead to the economic development of any nation.

References

1. Park J, Edington DW. A sequential neural network model for diabetes prediction. Artif Intell Med, 2001; 23: 277-293.
2. Park J, Jee S, Edington DW. Projection of health risk status: application of Markov chain model in Korean population. Population Health Metrics, 2004; 2: 1-10.
3. Henke RM, Goetzel RZ, McHugh J, Isaac F. Recent experience in health promotion at Johnson & Johnson: lower health spending, strong return on investment. Health Aff (Millwood), 2011; 30: 490-499.
4. Musich S, McCalister T, Wang S, Hawkins K. An evaluation of the Well at Dell health management program: health risk change and financial return on investment. Am J Health Promot, 2015; 29: 147-157.
5. Sherman BW, Lynch WD. Connecting the dots: examining the link between workforce health and business performance. Am J Manag Care, 2014; 20: 115-120.
6. Cancellier C, Cassidy JD, Ammendolia C, Cote P. Are workplace health promotion programs effective at improving presenteeism in workers? A systematic review and best evidence synthesis of the literature. BMC Public Health, 2011; 11: 395.
7. Karimi M, Tsiachristas A, Looman W, Stokes J, van Galen M, Rutten-van Mölken M. Bundled payments for chronic diseases increased health care expenditure in the Nether-

lands, especially for multimorbid patients. Health policy, 2021; 125(6): pp.751-759.
8. Mosquera RA, Avritscher EB, Samuels CL, Harris TS, Pedroza C, Evans P, et al. Effect of an enhanced medical home on serious illness and cost of care among high-risk children with chronic illness: a randomized clinical trial. Jama, 2014; 312(24): pp.2640-2648.
9. Sporinova B, Manns B, Tonelli M, Hemmelgarn B, MacMaster F, Mitchell N, et al. Association of mental health disorders with health care utilization and costs among adults with chronic disease. JAMA network open, 2019; 2(8): pp. e199910-e199910.
10. Thorpe KE, Allen L, Joski P. The role of chronic disease, obesity, and improved treatment and detection in accounting for the rise in healthcare spending between 1987 and 2011. Applied health economics and health policy, 2015; 13: pp. 381-387.
11. Hodkinson A, Kontopantelis E, Adeniji C, Van Marwijk H, McMillan B, Bower P, et al. Accelerometer-and pedometer-based physical activity interventions among adults with cardiometabolic conditions: a systematic review and meta-analysis. JAMA Network Open, 2019; 2(10): pp. e1912895-e1912895.
12. Alt KW, Al-Ahmad A, Woelber JP. Nutrition and Health in Human Evolution–Past to Present. Nutrients, 2022; 14(17): p. 3594.
13. Ma J, Lander N, Eyre EL, Barnett LM, Essiet IA, Duncan MJ. It's not just what you do but the way you do it: A systematic review of process evaluation of interventions to improve gross motor competence. Sports Medicine, 2021; 51: pp. 2547-2569.
14. Polak R, Pojednic RM, Phillips EM. Lifestyle medicine education. American Journal of Lifestyle Medicine, 2015; 9(5): pp. 361-367.
15. Phillips EM, Frates EP, Park DJ. Lifestyle medicine. Physical Medicine and Rehabilitation Clinics, 2020; 31(4): pp. 515-526.
16. Abegunde DO, Mathers CD, Adam T, Ortegon M, Strong K. The burden and costs of chronic diseases in low-income and middle-income countries. The Lancet, 2007; 370(9603): pp. 1929-1938.
17. Collins AJ, Li S, Gilbertson DT, Liu J, Chen SC, Herzog CA. Chronic kidney disease and cardiovascular disease in the Medicare population: Management of comorbidities in kidney disease in the 21st century: Anemia and bone disease. Kidney International, 2003; 64: pp. S24-S31.
18. Hennekens CH, Hennekens AR, Hollar D, Casey DE. Schizophrenia and increased risks of cardiovascular disease. American heart journal, 2005; 150(6): pp. 1115-1121.
19. Scott D, Happell B. The high prevalence of poor physical health and unhealthy lifestyle behaviours in individuals with severe mental illness. Issues in mental health nursing, 2011; 32(9): pp. 589-597.
20. Pan XR, Hu YH, Li GW, Liu PA, Bennett PH, Howard BV. Impaired glucose tolerance and its relationship to ECG-indicated coronary heart disease and risk factors among Chinese: Da Qing IGT and Diabetes Study. Diabetes care, 1993; 16(1): pp. 150-156.
21. Cowie CC, Rust KF, Byrd-Holt DD, Eberhardt MS, Flegal KM, Engelgau MM, et al. Prevalence of diabetes and impaired fasting glucose in adults in the US population: National Health And Nutrition Examination Survey 1999–2002. Diabetes care, 2006; 29(6): pp. 1263-1268.
22. Edington DW, Burton WN, Schultz AB. Health and Economics of Lifestyle Medicine Strategies. American Journal of Lifestyle Medicine, 2020; 14(3): pp.274-277.
23. Dos Reis RCP, Duncan BB, Szwarcwald CL, Malta DC, Schmidt MI. Control of glucose, blood pressure, and cholesterol among adults with diabetes: the Brazilian National Health Survey. Journal of Clinical Medicine, 2021; 10(15): p.3428.
24. Fikriana R, Devy SR. The Effects of Age and Body Mass Index on Blood Glucose, Blood Cholesterol, and Blood Pressure in Adult Women. Indian Journal of Public Health Research & Development, 2018; 9(11): pp. 1697-1702.
25. Gokal R, Shillito L, Maharaj SR. Positive impact of yoga and pranayam on obesity, hypertension, blood sugar, and cholesterol: a pilot assessment. The Journal of Alternative and Complementary Medicine, 2007; 13(10): pp. 1056-1058.