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Review Article

Consequences Of Dietary And Lifestyle Factors To Prevent Chronic Disease

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ABSTRACT

Chronic diseases have become a significant public health concern globally, leading to increased morbidity, mortality, and healthcare costs. However, evidence suggests that many chronic diseases can be prevented or delayed through the adoption of healthy dietary and lifestyle habits. This project aims to explore the impact of dietary and lifestyle factors on the prevention of chronic diseases and provide valuable insights for individuals, communities, and policymakers. The project begins by outlining common chronic diseases and their implications on individual health and healthcare systems. It emphasizes the importance of preventive measures to reduce the burden of these diseases. Subsequently, it delves into the role of dietary factors, highlighting the benefits of a balanced and nutrient-rich diet. The impact of macronutrients, such as carbohydrates, proteins, and fats, is discussed, along with the significance of incorporating fruits, vegetables, whole grains, and lean proteins into one's diet. Conversely, the harmful effects of excessive sugar, salt, saturated and trans fats, and processed foods are highlighted. Furthermore, the project addresses lifestyle factors that contribute to chronic disease prevention. It emphasizes the benefits of regular physical activity, maintaining a healthy weight and body mass index (BMI), and avoiding tobacco use and excessive alcohol consumption. It also stresses the importance of stress management, adequate sleep, and mental well-being in preventing chronic diseases. To provide a comprehensive understanding, the project explores the impact of dietary and lifestyle factors on specific chronic diseases such as cardiovascular disease, type 2 diabetes, obesity, and cancer. It examines the evidence from scientific studies and research, supporting the notion that these factors significantly influence disease outcomes. Challenges and barriers faced by individuals in adopting healthy dietary and lifestyle habits are discussed, including sociocultural factors that influence choices. Strategies to overcome these obstacles and promote sustainable change are presented, emphasizing the need for education, awareness, and community programs.

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INTRODUCTION

Long-term medical problems called chronic illnesses usually develop slowly and last for a long time, frequently throughout the entirety of a person's life. These illnesses are distinguished by their protracted duration, which often need continuing medical care and treatment. Chronic diseases often develop over time and may deteriorate gradually, in contrast to acute illnesses, which manifest suddenly and usually go away fast. Chronic conditions including cancer, cardiovascular disease (CVD), diabetes mellitus (DM), and neurodegenerative diseases (NDGDs) are slow-moving, long-lasting, and the main cause of death in the world, accounting for more than 60% of all deaths. The World Health Organization (WHO) reports that chronic respiratory diseases (CRDs), cancer (7.5 million), diabetes (DM) (4 million), and chronic obstructive pulmonary disease (DM) (1 million) are the leading causes of mortality worldwide. (1) Geographical location, ethnicity, gender, age, and environmental factors like solar ultraviolet (UV) radiation, occupational exposure to carcinogens and mutagens, bacterial/viral infection, genetic susceptibility, and modifiable risk factors like diet, smoking, alcohol use, physical activity, and body mass all play a role in the etiology of chronic diseases. Countries with traditional dietary practices that emphasize consuming fruits and vegetables frequently have lower incidences of chronic illnesses. (2) Numerous studies have found that dietary polyphenols can reduce the effects of cellular aging when the damage is brought on by the generation of reactive oxygen species (ROS) in the body. Since the main advantage of these dietary components is their health-protective function, there is a great deal of scientific interest in creating techniques to target various cell processes by ingesting such components in order to potentially lower the risk of chronic illnesses. (3)

Convincing and Probable Relationships between Dietary and Lifestyle Factors and Chronic Diseases

Dietary and lifestyle factors	CVD	Type 2 Diabetes	Cancer	Dental Disease	Birth defects	Obesity	Metabolic syndrome	Depression	Sexual dysfunction
Avoid smoking	↓	↓	↓	↓	↓				↓
Pursue physical activity	↓	↓	↓			↓		↓	↓
Avoid overweight	↓	↓	↓						↓
Diet									
Consume healthy types of fats	↓	↓					↓		
Eat plenty of fruits and vegetables	↓		↓		↓	↓			
Replace refined grains with whole grains	↓	↓				↓	↓		

Limit sugar intake	↓	↓		↓		↓	↓		
Limit excessive calories						↓	↓		
Limit sodium intake	↓								

Relationship between dietary and lifestyle factors and chronic diseases. (4)

The global burden of chronic diseases

Globally, the burden of chronic illnesses is rising quickly. According to estimates, chronic illnesses were responsible for almost 60% of the 56.5 million recorded deaths worldwide in 2001 and roughly 46% of the total burden of disease. By 2020, it is anticipated that the burden of NCDs would rise to 57%. Cardiovascular illnesses account for about half of all chronic disease fatalities. (5) Obesity and diabetes are also exhibiting concerning tendencies, not only because they currently impact a significant section of the population but also because they have started to manifest earlier in life. The problem of chronic diseases is not just present in the industrialized world. (6) Contrary to popular opinion, chronic disease-related public health issues are becoming more and more severe in emerging nations. From 84 million in 1995 to 228 million in 2025, the number of persons with diabetes in the developing countries would have increased more than 2.5-fold. Around the world, poorer nations will carry 60% of the burden of chronic illnesses. As a matter of fact, India and China currently have more cases of cardiovascular disease than all of the economically developed nations combined. (7)Regarding overweight and obesity, not only has the present prevalence already reached unheard-of heights, but it is also rising at a significant rate each year in the majority of emerging countries. The effects of this phenomena on public health are startling and are already becoming clear. (8)

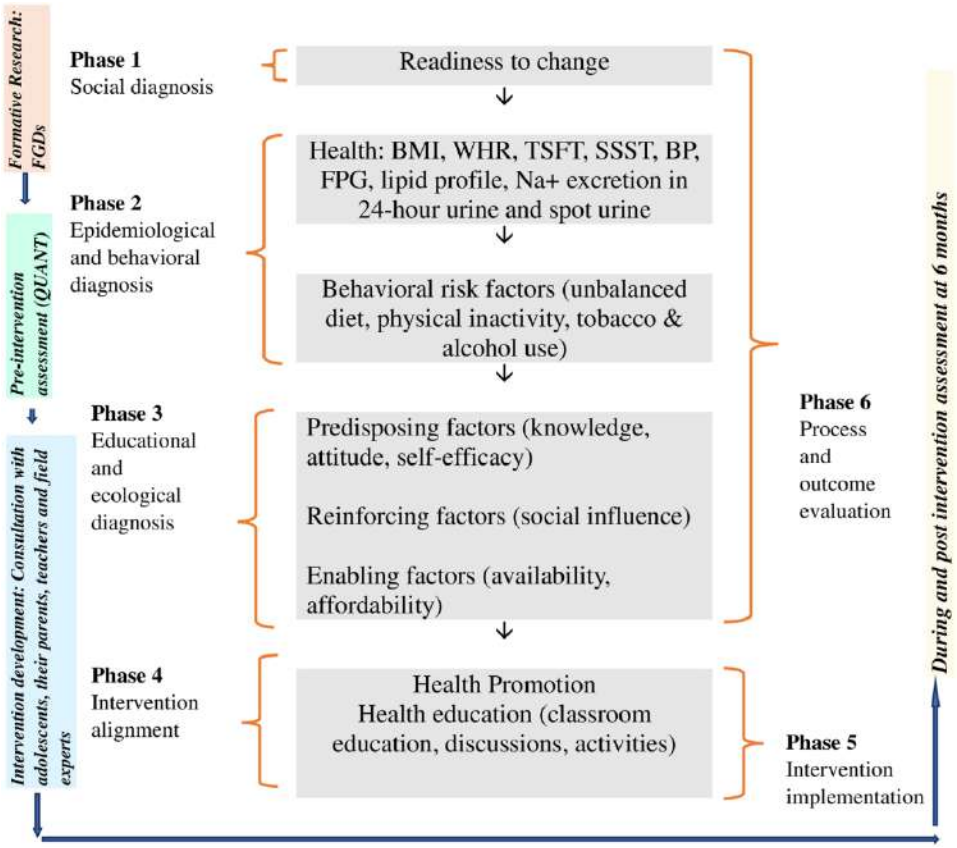
Methodology

Twelve public schools in the Indian city of Chandigarh will be chosen at random, with each school considered as a cluster. Six schools will be randomly assigned to the intervention group after the baseline evaluation, and six to the control group. Students in the eighth grade (aged 10 to 16), along with their parents and instructors, will take part in the study. For statistically significant inference, a sample size of 360 students (12 clusters x 30 students) has been estimated. The development of health promotion initiatives to stop the use of an imbalanced diet, inactivity, alcohol, and cigarettes will be done using the PRECEDE PROCEED Model. The duration of interventions in a school environment is six months. The intervention for pupils will include interactive learning sessions lasting 30 minutes each week and sessions of 30 minutes of physical exercise four times each week. Educational sessions will be conducted for parents and teachers for 30 minutes, four times during the intervention period. Primary outcomes will be changes in the prevalence of behavioural risk factors from pre- to post-intervention. Changes in anthropometric, physiological, and biochemical measures will be the secondary outcomes. The difference-in-difference (DID) method will be used to measure the net change in the outcomes. (9)

Intervention development

To improve the chance of efficacy, the intervention is based on the PRECEDE-

PROCEED model (PPM). (10) This model will assist in the creation, application, and assessment of the health promotion intervention. By methodically utilising different PPM stages, the intervention design will be created. (11) (12)



Phase 1 social diagnosis.

Formative study will be done to comprehend the social surroundings of participants and their level of knowledge of behavioural risk factors for chronic illnesses.

Phase 2 epidemiological and behavioural diagnosis.

Epidemiological diagnosis will concentrate on certain health problems, such as the prevalence of chronic illnesses, and behavioural diagnosis will address risk factors, such as an imbalanced diet, inactivity, cigarette, and alcohol use. A cross-sectional survey will be used to evaluate these factors. The cross-sectional survey's methodologies, materials, equipment, and research participants will all be used for the end-line survey, which will be conducted in both arms. Therefore, this cross-sectional survey will serve as the baseline for the current research.

Phase 3 Educational and ecological diagnosis

In this phase, the information gathered from formative research and baseline assessment will be used to identify the social and environmental reasons causing particular behaviour. The baseline data will assist clarify the objectives and guide the development of the intervention by revealing the prevalence of behavioural risk factors among the participants.

Phase 4 Intervention alignment

Adolescents, parents, and teachers will be consulted throughout this phase to construct the intervention. The intervention will be strengthened by using the insights gained from focus group talks to better comprehend the needs and recommendations of the "participants" for the intervention. (13)

Phase 5—Intervention implementation

The researcher will carry out interventions in a school environment over a six-month period. Adolescent treatments will consist of 30-minute interactive learning sessions four times a week and 30-minute physical activity sessions. (14) Throughout the intervention phase, there will be four 30-minute educational workshops for parents and teachers. (15) In addition to the lecture and discussion, at least 50% of the time will be devoted to creating posters, having arguments, and exchanging experiences. (16) (17)

Phase 6 process and impact evaluation

To determine whether the intervention is being carried out in accordance with the plan, analyse the factors facilitating and impeding the use of the health promotion intervention, and identify processes that need to be improved, process evaluation must be started at the time the intervention is implemented. (16) Written data will be gathered about the uptake of the intervention, behavioural changes made, the number of teenagers who exhibit the behaviours, and the number of them who share them with their families. The teenagers in the intervention arm will be interviewed once to gather these data. (18)

RESULT

After six months, an outcome evaluation will be conducted to look at how the intervention affected the outcome markers. Both the control arm and the intervention arm will employ the Difference-in-Differences (DID) technique to evaluate net changes following the implementation of the health promotion intervention. (19) The study's main findings will be changes in dietary intake (g/day) of sugar, salt, fruits, and vegetables, physical activity (metabolic equivalent/minute/week), current tobacco and alcohol use (%) among adolescents, and pre- and post-implementation health promotion intervention implementation in both the intervention and control arms.

Secondary objectives for teenagers in the intervention and control arms will include changes in body mass index (kg/m2), blood pressure (mmHg), and urine sodium excretion (mg/day) before and after the intervention package is delivered.

CONCLUSION

There is an increase in chronic illnesses. In order to prevent the creation of risk factors, academics, policymakers, and programme implementers must concentrate on evidence-based approaches. It may be more cost-effective to establish health promotion initiatives in schools that concurrently target parents, teachers, and teenagers. Scaling up primordial prevention to halt the spread of chronic illnesses might be evaluated objectively using the PRECEDE-PROCEED model for designing, implementing, and evaluating the intervention in a cluster Randomised Controlled Trial design using DID analysis. In conclusion, leading a healthy lifestyle—adopting a balanced diet, receiving regular exercise, keeping a healthy weight, abstaining from dangerous drugs, and getting adequate sleep—can greatly lower your risk of developing chronic illnesses. These results underline how crucial it is to choose a diet and lifestyle that will support long-term health and lower the risk of chronic illnesses.

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