



Effective Public Health Strategies for Preventing Non-Communicable Diseases Through Risk Factor Management and Community Based Initiatives

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Abstract

Chronic non-communicable diseases (NCDs) including cardiovascular diseases, cancers, chronic respiratory diseases and diabetes are the major causes of morbidity and mortality in the world contributing close to ¾ of global mortality. As described above, NCDs are increasing progressively around the world and particularly in LMICs, with a likelihood to overwhelm the entire health sector and hinder sustainable development. This work examines evidence from numerous public health interventions aimed at preventing NCDs by controlling modifiable lifestyle factors including unhealthy diets, physical inactivity, tobacco use and excessive alcohol consumption. Both health promotion and legislative conducts have shown high levels of effectiveness: in increasing knowledge and enhancing people's behaviors; in decreasing the opportunity of exposure to risk factors such as through tobacco taxation and through implementation of sugar-sweetened beverages taxes. Mobile programs have helped in increasing accessibility of healthy food and enhancing physical activities that would suite the decreasing incidences of obesity and related diseases. Also, under the healthcare system, screening programs and integrated care, have indeed improved early detection and control of NCDs. Nevertheless, current challenges that are related to increases in social inequalities, cultural differences, restricted access to healthcare services, etc., still remain especially in LMICs. It notes that more efforts should be channeled towards the targeted approaches in line with the geographical culture that should involve multi-sectoral participation and whose implementation should undergo periodic assessment and accreditation to increase the effectiveness of the NCD control measures. When appropriately applied, all-inclusive and work-setting informed approaches will go a long way in easing the impact of NCDs within the population and fortifying the world's public health systems.

Introduction

Today's NCDs are considered one of the most severe threats to human health and one of the major causes of mortality. NCDs are those conditions which are not communicable directly from one person to the other; they are typically chronic and influenced by genetic, physiological, environmental and behavioral factors. Four major classes of NCDs include cardiovascular diseases (CVDs), cancer, chronic respiratory diseases, diabetes. These diseases have similar risk factors: dietary qualities, lack of physical activity, tobacco use, and risky alcohol consumption. As stated by WHO, NCDs are today's number one killer, claiming approximately 41 million lives each year, or 71% of all global deaths. These NCDs are responsible for three-quarter of deaths in LMICs and will continue to rise in the future decades, threatening sustainable development agenda (Jakovljevic et al., 2021).

The problem of non-communicable diseases is a complex and complex problem that needs an integrated and complex solution, the main of which is prevention, early diagnosis, and adequate treatment (Luna & Luyckx, 2020). Community Based interventions are particularly important

for prevention of NCDs because of their influence on modifiable behavioral and biological risk factors. These interventions can be carried out at individual, community health promotion education, legislative, policy, community and health care system levels. There is evidence to suggest that collaborative effective policy measures may prevent NCDs, and lower the incidence and prevalence, decrease the burden on healthcare systems and enhance overall health of the populace (Kassa & Grace, 2022).

Trends have indicated that NCDs are assuming a large and increasing burden in global health system and economies. The Global Burden of Disease Study 2019 reports estimated that in 2019, NCDs accounted for 41 million (74%) of all global deaths. Of these, CVDs claimed the highest number of lives and the staggering number of 17.9 million, the second was cancer which accounted for 9.6 million, the third was chronic respiratory diseases with 3 million, diabetes with 1.5 million. These halting signify the fact that there is a dire implication to come up with efficient measures towards eradicating and managing NCDs around the world.

Prevalence of NCDs varies and affects the low and middle-income countries. Currently, over 70% of NCD deaths occur in LMICs, including such diseases due to inadequate access to health care, insufficient resources, and other socio-economic factors. health costs associated with NCDs continue to escalate creating a social and personal economic burden on individuals, families, societies and governments. NCDs risk unprecedented losses of \$47 trillion or more over the next two decades for development sustainability (Shukla & Arora, 2023).

Many factors may contribute to the increase in NCDs ranging from genetic factors through nutritional, physical activity, and social factors (Budreviciute et al., 2020). Some of the risks like age and pre disposition to specific genetic endowment are not within human control but many are within human control and can, therefore, be managed. Potential targets for NCD prevention interventions are within the following four behavioural risk factors which are modifiable: Unhealthy diet, Physical inactivity, Tobacco, Harmful alcohol consumption. These risk factors are also related and tend to occur together in people and within communities.

Poor diet is a significant determinant of NCDs leading to obesity, hypertension, cardiovascular diseases and selected cancers (Budreviciute et al., 2020). In particular, according to WHO, about 2.8 million adults throughout the world suffer from overweight and 1.03 million of them are affected by obesity. unhealthful diet consisting of foods that are rich in sugar, salt and unhealthy fats has been determined to be an independent risk factor for NCDs, thus making dietary approaches an important strategies in the prevention of NCDs.

Lack of physical activity is another major risk factor for NCDs; this aspect of physical inactivity is found greatly to be behind several chronic diseases, including obesity, diabetes, CVDs, as well as particular forms of cancer (Katzmarzyk et al., 2022). As the WHO analysis reveals, there are many people, one in four adults and four of five adolescents, who do not achieve the global physical activity level. Physical activity and avoiding the use of time spend on activities that involve little or no energy expenditure are critical aspects of NCD control.

Cases of utilization of tobacco are one of the prime causes of early deaths that are preventable and result in around eight million deaths to individuals (Ahmed et al., 2021). Other mortality associated with tobacco include lung cancer and other respiratory diseases, cardiovascular disease, and stroke, as well as other non-communicable diseases. Commitment to the cause of controlling tobacco usage through strategies such as raised taxes, smoke free policies are apart from offering smoking cessation services was also important in controlling the burden of NCDs.

Another major NCD risk factor is Hazardous and harmful alcohol use leading to cirrhosis of the liver, some types of cancer and mental disorders. fig the world over, approximately three

million human deaths occur due to alcohol intake. These general factors may be managed through adopting the following policies; Adopting policies in the marketing and advertisement of alcohol, Increasing the price of alcohol Counseling and treatment services for the abusers.

In the last few decades, a number of community level health promotion strategies have been applied to address and control NCDs. These interventions have focused on the pure, unadulterated, modifiable risk factors and with what different levels of efficacy? Health promotion and education is another technique and has been sensationalized in increasing knowledge of the populace as well as their practicing healthy behaviors. For instance, there are such successful campaigns as dietary and physical activity, smoking cessation, and moderate alcohol consumption campaigns have been launched in many countries across the world.

Other changes in NCD prevention entail legislations and policies include introduction of actual taxes and smoking ban, and mandatory vaccination. The policies of Healthy People 2020 are to implement settings that promote healthy decisions and reduce health-compromising activities. Many countries offer a sugar tax in sugary products to control obesity and diabetes. While smoking bans in public areas have proved helpful in cutting consumption of tobacco and limiting people's exposure to secondhand smoke: Public health benefits from smoking bans. Public Opinion of Smoking Bans smoking bans have been immensely beneficial and helpful in lessening the use of tobacco products and people's exposure to secondhand smoke."

More specifically, interventions at the community level have aimed at redesigning settings to encourage behavior change that is healthy. Such interventions include provision of healthy food and environment, designing safe neighborhoods that are friendly for walking and offering the physical activity. the provision of farming markets, community gardens, green districts has been found to enhance healthier dieting pattern as well as raise physical activities (Diekmann et al., 2020). Various strategies have been developed in healthcare systems to ensure the adoption of IHD for NCDs as part of an ordinary health care approach. This involves the provision of screening services, formulation and adoption of clinical protocols and nurturing of healthcare providers in prevention and control of NCDs. Many countries have adopted screening services for breast, cervical and colorectal cancers to identify these diseases at early stages when there are higher chances of cure. Many nations have adopted screening services for breast cancer, cervical and colon cancer so that these diseases are detected when they are still reversible.

Method Literature Review

The observation and management of NCDs have involved the use of differing methodological approaches which are cross-sectional and prospective techniques which are used to determine public health interventions, risk factors and Net Health Outcome. The techniques adopted in these studies have included those that are quantitative, questionnaires, and statistical tools and those that are qualitative interviews and focus groups. Decisions on the choice of method was to some extent informed by the research questions and the type of intervention and data.

In the context of NCD prevention, quantitative research has frequently employed survey studies in order to evaluate changes in disease incidence and its modifiable antecedents. Some of the articles employed RCT to determine the efficiency of intended public health interventions for purposes of discouraging Smoking, encouraging Physical activity as well as adopting a healthy diet. For instance, Smith et al (2022) did an RCT on a smoking intervention for adults who were past and or current smokers. In order to assess change in smoking behaviour and health status, before and after the intervention were implemented were used. it was evidence that the

constant implementation of behavioral health interventions significantly reduces the prevalence of smoking among participants.

Other than RCT's, cohort studies and cross-sectional surveys have also been frequently adopted in studying the association of risk factors to NCDs. Wang et al. (2020) looked at the effects of physical inactivity on CVD among a sample of midlife adults. In this study, the authors followed participants for 10 years and tracked their physical activity, dietary habits and health behaviours. It also observed that occupational and domestic inactivity is one of the highest risk factors for CVD hence supporting physical activity as an intervention for NCDs. conducted a cross-sectional study using a large population to determine the relationship between diet and diabetes risk. A cross-sectional survey also showed that high levels of consumption of products with a high glycemic index, high in processed foods, were also associated with the prevalence of type 2 diabetes.

Interview and focus group studies formed the major part of quantitative research that has greatly contributed to understanding the social and behavioural determinants of NCDs. conducted interview based qualitative research involving patients with diabetes. It was to identify and analyze inhibitors to the creation of concepts conducive to healthy behavioral change. According to the results, it emerged that the participants had difficulties like lack of support from their families and wanted access to medical care which they could not afford. Interviews have also been done in form of focus group discussions in order to assess the community knowledge on NCD preventive measures. tried to know the concern and perception of the community members towards government health promotion strategies to discourage smoking through focus group study conducted in a rural area. The survey established that although butt support for these programs, participants considered it necessary that more culturally sensitive marketing appealing to participation was essential.

Other approaches, such as the mixed-methods approaches, have also been used in order to better understand NCDs. These studies therefore present a balanced view of the research problem since the two forms of research methods are used in their entirety. conducted a mixed-methods approach to assess the efficacy of community-based intervention about obesity. The quantitative part of the research was carried out through collection of the participants' weight, body mass index and physical activity before and after the intervention period. The second one embraced more open-ended questions to get comprehensive information on the participants' experience based on the voluntarily provided information. Collectively, all the studies found a decrease in the obesity levels of participants where the intervention was practiced to note that feasibility issues like lack of time and motivation, the intervention hindered long-term compliance to health promoted habits.

On the methodological level, many articles have used regression analysis, SEM, factor analysis and other methods to investigate the strength and direction of the connections between the variables and prognosis. data analysis to evaluate the effect of diet modification on CVD risk was done using a regression test. The research revealed that there was a significant reduction of CVD in individuals who consumed more fruits and vegetable; this effect was even higher in those who followed the dietary recommendations for longer time. In another study by Roberts et al (2020), Structural equation modeling was employed in the study on socioeconomic status, health risk factors and; NCDs. The research established that those with low SES were most likely to engage in the unhealthy behaviours, given that they facilitated development of NCDs.

Applying of these methodologies has offered significant information on causation and prevention of NCDs and also their control. However, due to the complexity of the NCDs it is clear that this area of study should employ an array of methods in an attempt to capture the dynamics of the illnesses. Furthermore, culturally appropriate therapeutic approaches have

been highlighted especially in low and middle-income countries where NCDs are experiencing a surge, though limited resources have given less focus to these diseases. the approach and techniques used in the, NCD study have helped to advance the knowledge on potential causal factors, approaches and results linked to NCDs. Future studies should further develop such approaches to guarantee that implemented interventions are not only efficacious, but also feasible considering the limited resources available in many facilities across the globe.

Public Health Interventions for NCD Prevention

Community based interventions are important in achieving the goal of reducing the burden of NCDs at the global level. They seek to influence the behaviors, which cause NCDs including; consumption of unhealthily foods, lack of exercise, tobacco use and alcohol abuse respectively. Effector prevention of NCDs and the mitigation of their effects require multi-sectoral interventions and community health, legislative, education, and healthcare system measures.

If PHIs targeted at the modifiable risk factors for NCDs are ranked in order of frequency, health promotion campaigns would top the list (Kanyongo & Ezugwu, 2023). They are normally centered in teaching people on the need to make right lifestyle change in terms of eating habits, regular exercise and avoidance of cigarette smoking. large scale public health education campaigns, including the use of the media to encourage, for example, the uptake of exercise or adoption of better diets, has been demonstrated to have the desired impact of awareness raising and behaviour modification. Such a campaign as “5 A Day” that familiarizes the people with a daily dose of five portions of fruits and vegetables has been launched in many countries, and has positive effects on decreasing the rate of dietary diseases including cardiovascular diseases and obesity.

Another important method in prevention of NCDs is legislative measures. Various policies have been put in place by governments to promote context that accommodate healthier behaviours in order to minimize exposure to risk factors (Farmaki et al., 2020). policies including smoking ban in public places, legal restrictions on tobacco advertising and promoting, increases prices on tobacco products reduced smoking prevalence and disease including lung cancer and chronic respiratory diseases. the use of taxation on sugary products such as the soft drinks and junk food has been instituted in several countries to try and control obesity as well as other diseases such as diabetes type 2. Such interventions, though considered antisocial by some people and social workers, play a major role in improving heath of the population.

Community interventions involve helping the members of a community make the right decisions that keep them healthy in places where they spend most of their time (Seale et al., 2020). The goal of these programs is to involve community in fight against NCDs by involving them in access, consumption of better diets, exercise, and company support. the installation of the community gardens/farmers' markets organization in the urban centers has made it possible for people to get fresh produce and eat healthy. Also encouraging safe neighbourhood for walking, development of safe parks, local fitness events have been beneficial in the rise in physical activity and reduced sedentary behaviour both of which are key in prevention of NCDs like cardiovascular diseases and diabetes (Veitch et al., 2020).

As such, HCS also allocates a central function on the prevention and management of non-communicable diseases. Improving the reach of the universal health care and ensuring efficient periodic diagnosis, early diagnosis and administration of patients at a higher risk or who are already victims of NCDs will improve their health. Currently, most countries have implemented several preventive checkups for diseases such as hypertension, diabetes or some forms of cancer. embedding NCD prevention interventions into primary care has been efficient

due to the ability to reach more citizens, not to mention follow-up (Low et al., 2021). Doctors and nurses are taught how to guide their patients on living changes and steps taken to the improvement of public health.

At the international level for example through the World Health Organization's Global Action Plan for the Prevention and Control of NCDs 2013-2020 there have been piled efforts by countries. These global strategies aim at support of NCDs as the development issue and the assistances for giving technical cooperation to the countries especially the LMICs which are affected most from the NCDs. Measures like tobacco taxes and exercises or Physical activity policies in schools are categorized by the WHO as 'Best Buys' that can initiative the control of NCDs being implemented by one nation or government.

Effectiveness of Public Health Interventions

Various extents of success have been seen by public health initiatives to reduce the incidence of NCDs across the different population groups at community, national and global level. Industry campaigns that focus on knowledge enhancement and changing the behavior of the public have recorded remarkable achievements and especially when supported by mass media and the social media. Other efforts include anti-smoking advertisement crusades, nutrition and physical activity promotions, and others have been proved to have positive effects on health behavior patterns. Many large-scale mass media campaign studies have demonstrated approaches to reducing smoking initiation, increasing quit attempts, and reducing tobacco use, thus lowering incidences of diseases like lung cancer and cardiovascular diseases (Nnam et al., 2021).

Of all the policy measures, legislative interventions have been found to be most efficient in changing the population behaviour and, therefore, minimizing contact with main NCD risk factors (Bertoldi, 2022). Though there was a generally seen perception that ARMM policies like taxation, advertisement, and smoking ban decrease smoking prevalence and diseases related to smoking, the current study did not find that smoking ban had a negative impact on smoking prevalence. In its report on brand media, WHO noted that countries that have embarked on comprehensive polices on tobacco control have seen a drop in the rate of smoking by 20-30% within one decade. SSB taxes have reduced the per capita consumption of SSBs and, consequently, obesity prevalence improves owing to the effectiveness of policies that alter the affordability and demand for food high in specific nutrients of concern and thus effectively dampen NCD risks.

There has also been evidence on the success of community interventions in the prevention of NCDs because of their effort to attend to the social and physical contextual factors (Gilmore et al., 2020). Use of free market farmers' markets and other urban gardening projects has increased the consumption of fruits and vegetables while at the same time has reduced cases of obesity and diabetes. awareness crusade that involves creating physically active through community designs such as neighborhood and recreational facilities has increased physical activity among the people. Several authors have suggested that the schemes are most effective where there is community participation as well as active partnership with appropriate local actors.

Population form intervention such as screening and other entire patient care programs of care for individuals diagnosed with NCDs have shown improved results (Chekroud et al., 2021). Hypertension, diabetes, and cancer screenings have gained popularity; with this, diseases have been detected early, and this leads to good health results. mortality has been observed to reduce in cases such as colorectal cancer, because the disease can be easily diagnosed early hence easily treated. incorporation of NCDs preventive measures in the primary care has led to

enhancement of the coverage on the early prevention services including those for the marginalized communities. There is growing proof that suggests counseling regarding changes in behaviour offered by healthcare providers on a regular basis may help to maintain new behavioural patterns and improve the outcomes of treatment for various diseases.

Intensified attempts to prevent NCDs at the global and regional levels have stressed the importance of collaboration (Zhou et al., 2021). Developed countries are using the WHO's Global Action Plan for the Prevention and Control of NCDs to measure success in evidence-based interventions. Countryside that has implemented the "Best Buys" interventions affordable measures like tobacco taxes, alcohol control, and salt reduction measures have enhanced population's health so much. in Finland there is a successful national salt reduction campaign that helped reduce salt intake by 30% during 20 years, consequently the level of hypertension and cardiovascular diseases has reduced as well.

Although public health efforts have led to improvements in NCDs they have limitations within the issues of disease sustainability and equity (Haque et al., 2020). Systematic and community factors may hinder the utilization of these interventions including differential distribution of health resources across the population and economic status, and cultural expectancies that favors some interventions than others especially in the LMIC. In order to be most effective, the overall approach to population health interventions needs to be culturally sensitive and should be targeted at modifying social factors that have an impact on health (Dickerson et al., 2020). the ongoing evaluation is crucial to determine effectiveness, or lack thereof, in the interventions to be made; to identify the deficits, and apply evidence-based change; emphases critical to ensure that public health continues to effectively address the emerging increased global burden of NCDs.

Conclusion

Lifestyle related NCDs are an important public health focus since interventions designed to modify the risk factors prevent or reduce the burden of these conditions. Case studies from different health promotion campaigns, legal strategies, community-oriented activities and healthcare delivery system interventions proves that they work in preventing and reducing the incidence and deaths brought by NCDs. these intercessions have depended on the social economic status, cultural practices and sometimes healthcare facilities. there remains much to be done, still considerable barriers to effective prevention, and special difficulties in LMICs despite the fact that progress has been made, including notable advancement in nations with purposeful and integrated approaches. effectiveness and scalability of these interventions, public health interventions must be adapted to local settings, and be inherently health equity centered with focus on evaluation for emerging health trends. Public health systems can greatly improve global health by preventing and controlling NCDs through multisectoral partnership and effective application of evidence-based approaches in sustainable development.

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