

An Educative Systemic Solution to COVID-19 Pandemic

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Abstract¹

The COVID-19 pandemic has generated a great impact on public health all over the world. In order to control it, many strategies had been adopted. Nevertheless, not enough emphasis has been given to improving the immune system of the persons, which is, probably, a better solution to this and other pandemics. With this purpose, an educative systemic solution has been developed. A Sustainable Systemic Health diploma course has been created and taught online during the 2020-2021 scholar year to students who learned about the following themes: 1- Health in Mexico and the world, 2- Food and Nutrition, 3- Physical Activity, 4- Hygienic Habits, 5- Systemic Health, and 6- Final work, where the students wrote a personal Healthy Habits Handbook, with the purpose of helping them to apply the healthy recommendations of this diploma course. The premises, objectives, and methods of this educative systemic experience (which has the purpose of improving the immune system of the students through the substitution of unhealthy for healthy habits) are explained in this paper. This experience has been applied at the National Polytechnic Institute of Mexico during the 2020-2021 scholar year, with 23 graduate students.

Keywords: *Health Education, Healthy Habits, Food and Nutrition, Physical Activity, Systemic Health.*

1. Introduction

The COVID-19 pandemic originated in China at the end of 2019 has caused, until October 2021, about five million deaths worldwide (Johns Hopkins University,

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2021). The control strategy and solution to this problem recommended by the WHO (World Health Organization) and adopted by most countries in the world, is to seek the development of vaccines and its massive application, and to find effective drugs to cure it.

The option of developing vaccines has had positive results in the short term, but it would be better to look for other options that are safer and more effective in the long term, to increase the capacity of the immune system of each person to deal with this and other infectious maladies.

One option is to educate people to adopt healthy habits in order to prevent chronic degenerative diseases, such as cardiovascular diseases or Diabetes Mellitus Type 2, through educational strategies that promote the change of current unhealthy habits (abuse of junk food, lack of physical activity, excessive stress, lack of relaxation and sleep, among others), which weaken the immune system of people, and replace this unhealthy habits with other more hygienic habits that strengthen it.

This educational strategy has been developed and implemented at the National Polytechnic Institute in Mexico City, through the Sustainable Systemic Health diploma course, in which the health problems in Mexico and the world are analyzed and certain tactics are recommended to implement changes of unhealthy habits and replace them with new healthier habits, with the ultimate goal of strengthening the immune system of each person and improving the level of health and quality of life of the students (Aceves-Hernández, 2015).

2. Lessons learned from COVID-19

From the experiences in Italy, one of the first European countries to be impacted by COVID-19, during 2020, we have learned the following lessons:

1. SARS-CoV-2, which causes COVID-19, is highly contagious and dangerous.

2. This disease is more lethal in elderly people and in those suffering from some comorbidity, such as cardiovascular diseases or Diabetes Mellitus, because it weakens the immune system, which is the one that defends the human body from external aggressions.
3. Due to its high contagiousness and dangerousness, public and private health systems are easily collapsed, leaving many citizens unprotected.

3. Preventive measures against contagion

To reduce the level of contagion of this disease it has been recommended to take preventive actions such as:

1. Keep a healthy distance from other people, at least one and a half meters,
2. Avoid crowds in closed and poorly ventilated places,
3. Stay as much as possible at home, isolated, working or studying through Internet or other means,
4. Wash hands frequently and sanitize clothes,
5. Avoid greeting with hugs or touching hands,
6. Use mouth covers when there are people close to you,
7. Cover your mouth with the inside of your elbow when sneezing, and sanitize your hands frequently,
8. Sanitize your hands when you enter a crowded place,
9. Take your temperature when entering a crowded place to detect if you have fever, in which case, you should take the appropriate measures, such as going to a doctor's office, to verify if it is COVID-19,
10. Perform laboratory tests to verify if you have COVID-19 before traveling to other countries or going to a crowded meeting,
11. Cancel face-to-face classes in schools or face-to-face meetings in closed places to reduce the risk of contagion, and replace them, if necessary, by video conferences or other means,
12. Get vaccinated.

In fact, these actions help to prevent contagion, but they are not getting to the heart of the matter, that is, they do not help to strengthening the immune system, which is what helps to overcome this disease.

4. Context of health problems in the world

In the present 21st century, deaths due to chronic diseases such as ischemic heart disease and stroke have greatly increased, causing fifteen million deaths in 2019, as shown in **Figure 1** (World Health Organization, 2020). These two diseases are mostly caused by unhealthy habits such as those mentioned in the introduction to this paper.

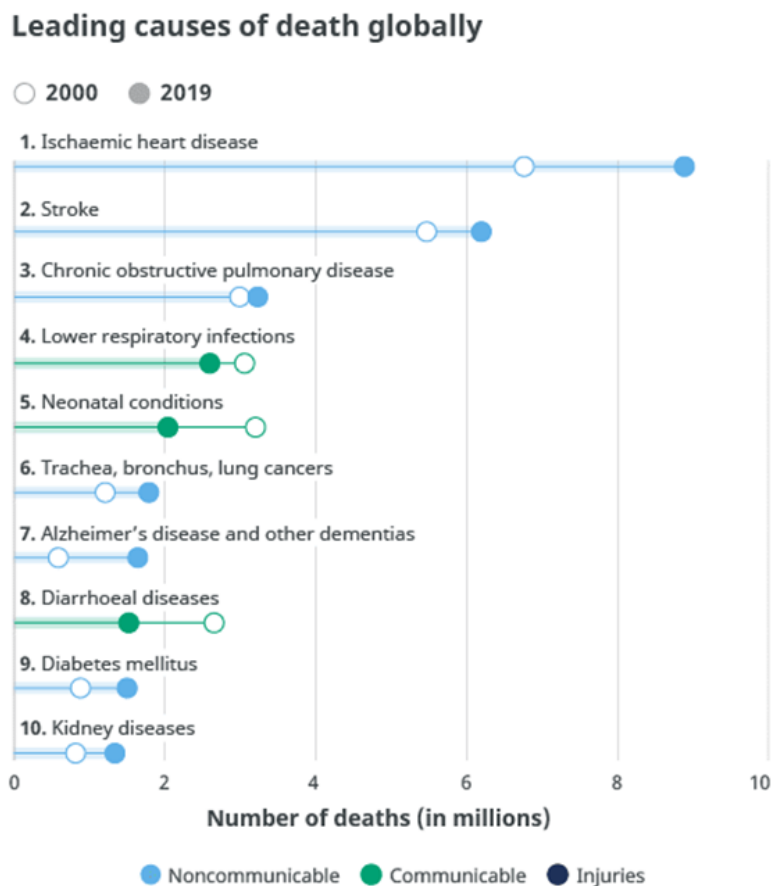


Figure 1: Leading Causes of Death Worldwide (WHO, 2020).

4.1. Context of health problems in Mexico

Mexico, like many other countries in the world, has had in recent decades the problem of an epidemic of overweight and obesity, which in turn gives rise to several chronic degenerative diseases such as Diabetes Mellitus Type 2 and Arterial Hypertension that have been the two leading causes of mortality in Mexico, with more than 100,000 deaths in 2018 for each. See **Figure 2** showing the growth trends of these diseases and **Table 1** indicating statistics of mortality of these chronic degenerative diseases in Mexico since 1980.

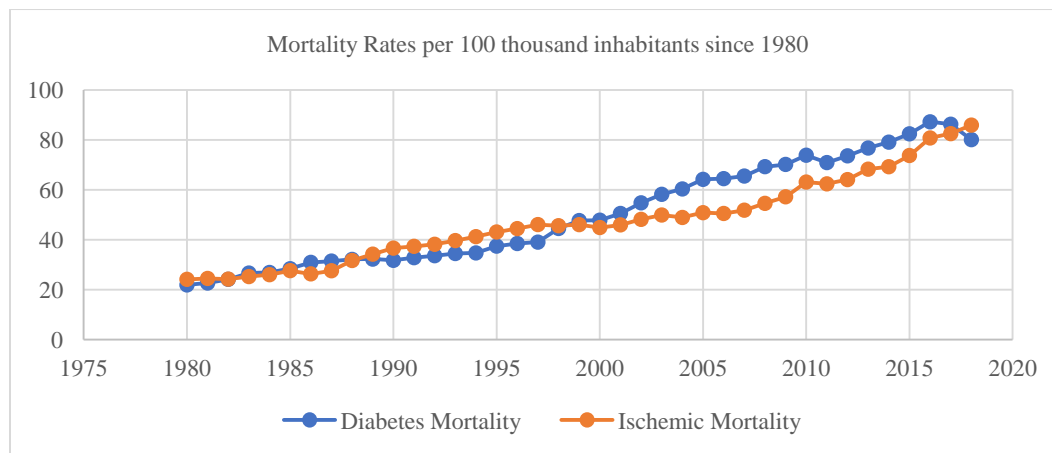


Figure 2: Growth trends in Diabetes Mellitus and Ischemic Disease in Mexico (Mexico-Maxico, 2021).

Table 1: Statistics of Diabetes and Ischemic diseases mortality in Mexico (Mexico-Maxico, 2021).

Year	Diabetes		Ischemic diseases	
	Number of deaths	Mortality rate per 100,000 inhabitants	Number of deaths	Mortality rate per 100,000 inhabitants
1980	14,626	21.88	16,132	24.13
1990	25,782	31.73	29,764	36.33
2000	46,614	47.82	43,753	44.88
2010	82,964	73.85	70,888	63.10
2018	101,257	80.09	108,616	85.91

Some public health organizations of the Mexican Government, such as IMSS (*Instituto Mexicano del Seguro Social*) and ISSSTE (*Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado*) have planned and implemented awareness campaign strategies such as PREVENIMSS and PREVENISSSTE to prevent and control such diseases, but to date, the results have been not very encouraging. The growth trend of these diseases has not stopped increasing in the last 40 years, since the 1980s, especially since the implementation of the neoliberal strategy in the country's socioeconomic development model. Faced with such meager results of these strategies, it is evident that more effective alternatives must be sought to control these diseases and their growing trend. One of these alternatives is the Sustainable Systemic Health diploma course described below. This option is already implemented at the National Polytechnique Institute of Mexico and must be supported and complemented with policies of the Mexican state, to:

1. Promote and facilitate the availability of healthy foods, such as fresh vegetables and fruits, as well as legumes and non-GMO cereals, accessible to the entire population at all times and places, and not only reduce governmental activity to putting labels on the packaging of industrialized products, which are, mostly, junk food, harmful to health.
2. Make available to the general population, places suitable for physical activity, such as walking and running or practicing Yoga and Tai-chi, where people can exercise daily, and achieve and maintain a good level of physical and mental health.
3. Legislate so that all administrative heads of private companies and governmental offices promote and facilitate physical activity of employees, within normal working hours, and in places close to their offices and workshops. This may even improve labor productivity.
4. Increase the value of the minimum wage, so that workers have sufficient income to adequately meet the basic needs of their families.
5. Include in all levels of education, from elementary until professional levels, subjects that include public, family, and personal health issues, so that all people are well informed and motivated to adopt healthy habits.

5. A systemic solution

In order to solve the severe problem caused by chronic degenerative diseases in a holistic manner, the following systemic model for solving complex problems has been proposed (**Figure 3**):

1. Awareness. It is very important to make people aware of the main health problems in the country and in the world and about the importance of having good personal health in order to be able to function well in society and have a longer, more productive, and happier life.
2. Motivate. Motivation is very important for people to take the decision to act in order to solve their health problems, generally by changing their habits.
3. Training. Students should be trained to know what new healthy habits they should adopt, leaving aside their harmful habits.
4. Implement. With the awareness, motivation and training obtained, students can implement the most appropriate strategies to adopt the recommended hygienic habits.
5. Support. The personal decision to adopt healthier habits should be supported by governmental strategies that favor the adoption of more hygienic habits. Family, friends and/or co-workers can also be supportive.
6. Evaluate. By evaluating the results obtained, it will be possible to know the failures that this implementation may have, and improvements may be suggested to help to obtain the desired results.
7. Improve. Applying the continuous improvement strategy, and adopting the improvements suggested in the evaluation of the previous step, it will be possible to obtain the desired results.



Figure 3: Systemic Model for Solving Complex Problems

This systemic model for solving health problems caused by chronic degenerative diseases has been implemented through the Sustainable Systemic Health diploma course at the National Polytechnic Institute in Mexico City, and the results are promising.

6. Description of the diploma course

The Sustainable Systemic Health diploma course, which has a duration of 180 hours, consists of six modules of 30 hours each, which have been denominated as follows:

1. Health in Mexico and the World

2. Food and Nutrition
3. Physical Activity
4. Hygienic Habits
5. Systemic Health
6. Final Work

The interrelationship among each of this modules is shown in **Figure 4**.

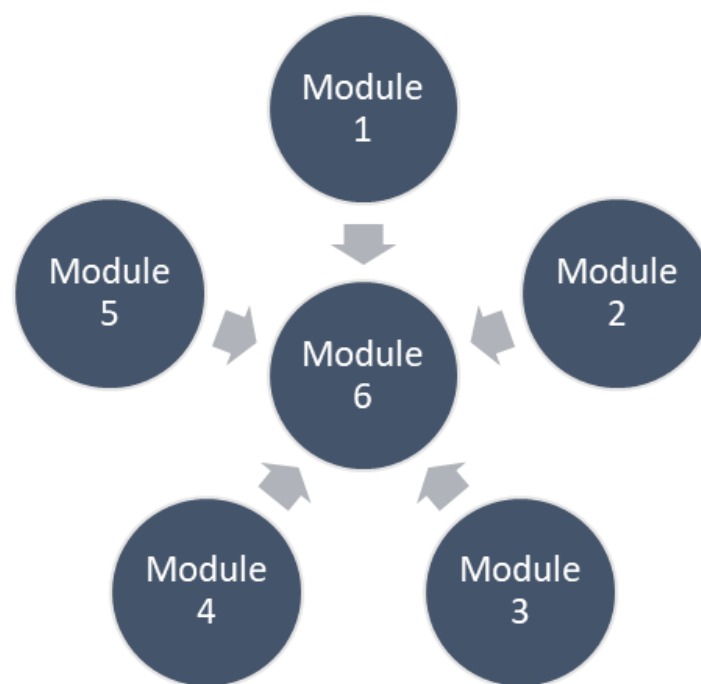


Figure 4: Interconnection among the modules of the Sustainable Systemic Health diploma course.

The themes of each module are as follows:

6.1. Module 1- Health in Mexico and the World

The evolution of the main preventable diseases in Mexico and the world is shown, their structural causes are analyzed in depth, and viable strategies to prevent these diseases are envisioned. Students are made aware of how and why these chronic

degenerative diseases originate and how they can be prevented at the individual level, by changing personal habits, or at the institutional level, with public policies implemented by the federal government, to change the current *obesogenic* environment (caused by the socioeconomic development model applied in recent decades), for a *healthier* one, through the implementation of policies that favor the change of current harmful habits towards other much healthier habits.

6.2. Module 2- Food and Nutrition

The increase in overweight and obesity rates in Mexico and the world is mainly due to changes in eating habits. Many people eat mostly junk food and beverages, which are fattening, but do not adequately nourish the body of the person. These changes in eating habits have been caused, in large part, by the change in the socioeconomic model since the 1980s towards neoliberalism, which has meant that people no longer have the time or money to eat healthily, and have switched to eating junk food, unhealthy and excessively fattening. This module provides viable alternatives to prepare healthy and economical food at home, in order to stop consuming industrialized junk food that proliferates in the local market.

6.3. Module 3- Physical Activity

The change in the socioeconomic model has also favored that neither children nor adults have the time and desire to practice physical activity. Children are no longer allowed to play in the street or in parks, because there is too much public insecurity. So, children spend their time locked up in their homes, playing electronic games in which, they only use their fingers to play in front of the electronic screens. The same happens with adults, who spend too much time working or commuting from home to work or school and vice versa, and have no time or energy left to be physically active. In this module, students are made aware of this problem and options are offered so that they can practice physical activity for at least half an hour each day. With this information, they can change their habit of a sedentary lifestyle for the habit of daily physical activity.

6.4. Module 4- Hygienic Habits

The level of health of each person depends, mostly, of the habits that each person has. This module analyzes the habits that each individual must have in order to maintain an adequate level of health and quality of life, in the context of current life. These habits include the topics mentioned above, such as food-nutrition and physical activity, but also includes relaxation, rest and sleep, so that the individual can live without too much stress and sleep well enough each night to be able to function adequately the next day in their work, family, and social activities, with a high level of satisfaction and health.

6.5. Module 5- Systemic Health

This module addresses the subject of health in a holistic manner, dealing with all the factors that influence it (genetic, social, mental, emotional, environmental, and spiritual). Each person's level of health is the result of the holistic interaction of these different factors. "Health is a state of complete biopsychosocial well-being and not just the absence of disease," as defined by WHO (World Health Organization, 2021). However, health can also be defined not as a state, but as a holistic process, in which multiple factors intervene, to obtain a variable, but preferably high level of well-being of the individual and society, in order to function adequately, within the space-time in which each one lives. This process of health-illness must occur in harmony with the natural and social environment surrounding the individual, and this harmony must be sustainable in the long term. In other words, natural resources should not be depleted, so those future generations will also have sufficient resources for their own development (WCED, 1987).

6.6. Module 6 - Final Work

In the sixth and last module, a Final Work is elaborated, in which all the knowledge acquired during the first five modules is used, and it is complemented with the hygienic habits that each student intends to adopt immediately, in order to improve

his/her level of health, well-being and quality of life, in harmony with his/her family and the surrounding environment, in a way that is sustainable for all in the long term.

7. Evaluation of results

In July 2020, the first generation of 12 students graduated from this diploma course and the results have been promising: The students were made aware of the importance of the problem of chronic degenerative diseases in the country and in the world, which has led to an increase in the lethality rate of the COVID-19 pandemic. Most of these students were motivated to adopt more hygienic habits, which will have an impact on their personal and family health in the short and long term.

In July 2021, the second generation of 23 students graduated from this diploma course, and the results have been even more promising since the didactic techniques used were improved. Strategies such as teamwork were used, which obtained better results in terms of communication and support in small work groups of five people. The strategy of work based on specific projects was also used, such as the elaboration in each module of a chapter of their final work called “Hygienic Habits Handbook” personalized by and for each student.

Long-term results have yet to be evaluated, given the recent implementation of this educational model, but it can be expected that, with the systemic model for solving complex problems explained above, which includes continuous improvement, and with government support, better results can be obtained in a short period of time.

8. Conclusions

In themes of personal and public health, the old adages “Prevention is better than healing” or “An ounce of prevention is worth a kilogram of cure” work very well. It has been seen that, with the strategy of focusing most public and private resources on curing chronic degenerative diseases, such as cardiovascular diseases, the results have not been encouraging. Rather, it can be said that with this strategy, too many resources, time, effort, and money are being expended in order to cure or control these diseases, and the results are meager. The pandemic of obesity and other chronic degenerative diseases has continued to grow, and it is not yet possible to predict when they will be brought under control.

Therefore, the logical conclusion is that, through the systemic educational model proposed here, with a preventive approach to the chronic degenerative diseases that aggravate the incidence and lethality of COVID-19, it will be more feasible to obtain better results, with fewer material and human resources, and the final objective of getting a better level of health and quality of life for all the inhabitants of the country and the planet will be achieved, so that all people may have a healthier, longer, more productive and happier life.

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