ORIGINAL ARTICLE

Designing a Policymaking Pattern to Deal with Covid-19

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Abstract

Background: Due to the unpredictability of Covid-19, policymakers should look at this issue as a complex system in developing and providing solutions to deal with it. This research aimed to provide a policy model for dealing with Covid-19.

Methods: This is a qualitative study and used the theme analysis method. Data collection tools were semi-structured interviews and data analysis in open, centralized, and selective coding stages. The research area was the universities of medical sciences affiliated with the Ministry of Health. The research population of this study included senior managers and their successors who worked in the Corona headquarters with sufficient familiarity with coronavirus issues and practical and managerial experience and supervision of universities and hospitals. In this research, the required data were collected using field methods and interviews with 15 people theoretically and purposefully until the theoretical saturation was reached. The validity of the interview questions was reviewed and confirmed by experts.

Results: After analyzing the interviews and integrating the duplicate codes in several stages, 168 codes were obtained and divided into three main categories. These categories included information on the covid-19 in nine subcategories, sections dealing with covid-19 in seven subcategories, and a policy formulation framework in four subcategories.

Conclusion: Given the interdependence of economic, social, and cultural systems in the development of policies related to covid-19 and systemic threats, all aspects should be considered.

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Introduction

Promoting the health of individuals in communities to improve a healthy lifestyle is the ultimate goal of health systems in any country.[1] However, when societies face emerging and re-emerging diseases such as Covid-19, other health systems alone cannot tackle the issue due to the emergence of other fundamental problems, such as structural, social, and economic problems. The duty of the government in the above cases is t o act with all its might and capacity to counter it. It requires identifying the various dimensions of the problem and formulating sensible policies to deal with it. Therefore, dealing with this phenomenon requires providing a clear roadmap and formulating feasible policies.[2]

However, the policymaking process is associated with various challenges, from formation and formulation to implementation and evaluation. Some of these challenges, such as human factors,[3] structural factors,[4] and environmental factors (including social, economic, political, and cultural factors),[5, 6] are related to the stage of policy formation that depends on providing appropriate and workable solutions to succeed in these challenges. Another issue in policy formulation is excessive centralism in the organizations and authorities of decisionmaking and policymaking

processes. In such a case, the level of participation of organizational groups and non-governmental organizations is minimized, significantly reducing the richness of the adopted policies.[7]

Various studies have shown that the covid-19 is unpredictable.[8-11] Therefore, its unpredictability causes policymakers to formulate and provide a solution to this issue, not as a complicated system (i.e., a system with many components that have predictable and mechanical relationships) but as a complex system (i.e., they cannot be designed and predicted). A complex and systematic method must be used to deal with it, and policies should be formulated accordingly.

Coronavirus is a complex adaptive system.[12-14] The coronavirus is being learned as a complex system.[15] Of course, learning it is not like the brain, but learning the coronavirus is reflected in its structure and its interaction with the environment. The virus learns to change its structure and adapt to its high-risk environment better. Thus, knowing what information for what purpose is collected in an unrecognizable, unpredictable, and unrepeatable system is difficult.

Nevertheless, one of the principles of sophisticated compatible systems that plays a vital role in our understanding of the virus's behavior is that sophisticated compatible systems learn the "pattern" of the environment with which they will interact while this pattern can be modified over time and through learning. as happens in the case of coronavirus. The virus is constantly reviewing the pattern of the environment (human body) and changing it; so that, it can adapt more to the environment.

Of course, researchers also learn about the virus continuously, but the learning speed of the coronavirus is so high that researchers are always behind the virus. The fact that the behavior of complex systems is unpredictable can be seen in the behavior of coronavirus. Virus policies and strategies to deal with "danger" are always ahead of researchers' strategies to deal with "viruses."

Changing the virus's behavior will change its as a result of learning and changing the pattern obtained from the environment. Different emerging behaviors of this virus were reported in different parts of the world. However, when the virus's behavior changes, it seems that this behavior can be transmitted to other environments. The Delta, for example, originated exclusively in India but soon spread to other parts of the world and survived successfully.

Therefore, both virus and the human being try to overcome each other It is still impossible to say with certainty whether the human being will be able to overcome this virus in the short term. But, in this epidemic (on a country scale), we are not just dealing with two complex adaptive systems of the coronavirus and humans. However, the coronavirus has affected all the adaptable systems of our lives. We are not currently facing a complex infectious problem; however, dozens of other complex problems, such as family, social, economic, cultural, and educational problems make it difficult to choose appropriate policies to control the infection.[16] Therefore, based on system science, it is possible to deal with this virus and predict each stage by having the initial pattern. Over time, the pattern can be reviewed by studying the virus's behavior and the necessary preparation can be found for unforeseen conditions.

Methods

This research was in the framework of a qualitative approach and used the theme analysis method (content analysis). Data collection tools were semi-structured interviews, and data analysis was done in three stages of open, centralized, and selective coding. The research area was the universities of medical sciences affiliated with the Ministry of Health. The research population of this study was senior managers and their successors who worked in Corona headquarters (Table 1). They had practical and management experience, including supervision of universities and hospitals and sufficient familiarity with coronavirus issues.

In this research, the required data were collected using the field method and interviews with 15 people theoretically and purposefully until the theoretical saturation was reached. The validity of the interview questions was reviewed and confirmed by experts. For the semi-structured in-depth interview, general axes were identified according to the subject of discussion, and each axis was asked with a general and open-ended question. Then, with follow-up questions, the authors tried to understand the depth of the interviewees' opinions.

Analysis and reviews by research participants and knowledgeable people, as well as pluralism

Table 1: Demographic characteristics of the study population (15 people)

Variable		Frequency	Percentage
Education	Postgraduate	3	20
	PhD	12	80
Record of service	20 years and less	10	66
	Over 20 years	5	34
Age	Under 50 years	3	20
	Between 50 and 55 years	10	66
	Over 55 years	2	14

(multilateralism), were used to ensure the validity of qualitative data (Leung, 2015). The initial coding of each interview was returned to the interviewee to verify the data, and the extracted codes were then modified and approved. Finally, some senior university administrators provided the extracted codes, classes, and models for approval.

The theme analysis method was used in three-step coding to analyze the qualitative data. The interview process, data analysis, and extraction of categories based on coding were done systematically and methodically to increase the reliability of the research. To do so, t the interviews were recorded and implemented, typed on paper on the same day, and used as the primary research data.

Extracted code, which is the meaning of essential phrases derived from the participants, was placed in a category based on the subject's similarity and appropriateness. By comparing classes and subclasses, the authors extracted abstract themes and categories. According to interviews and inductive categorization, the basic, main, and comprehensive themes have been formed. Finally, the participants and experts extracted and finalized the themes qualitatively by reviewing the model.

Assessment of the Findings Reliability

The methodology and research design of this research can provide appropriate and reliable data and interpretations. Table 2 summarizes the criteria for measuring the adequacy of the research process and the quality of data and interpretations. Some researchers believe that reliability of data and interpretation should be investigated through a combination of criteria, including content analysis (Glosser and Strauss,2006; Charms, 2006; and Erickson et al,. 2016). The Lincoln and Guba's (1985) criteria include credibility, transferability, dependability, and confirmability. Moreover, Charms' (2006) criteria include credibility, originality, resonance, and usefulness.

Results

In the present study, after analyzing the interviews and integrating the duplicate codes in several stages, 168 codes were identified. In the first coding stage, all the interview texts were carefully reviewed and analyzed. Then, 168 primary codes in the form of content codes were manually considered basic themes, as briefly listed in Table 3.

In the second stage of the coding process, the extracted codes were categorized based on the subject's similarity and appropriateness and were considered the main themes (Table 4).

In the third stage of the coding process, broad themes were developed by combining the main related themes (Table 5).

According to the steps performed in this research, this model consists of 3 broad themes and 20 main themes. The broad themes included information on the covid-19, the sections involved with covid-19, and the framework for formulating policies.

Given that the ultimate goal of the present study was to provide a policy model for coping with Covid-19, the relationship between abstract categories and themes was finally explained, and presented in Figure 1.

Discussion

One of the features of the system is nonlinearity.[17] The

Table 2: Evaluating the quality of research findings

Criteria	Description
Credibility: Degree of matching research findings with research data	1. Review semi-structured interview questions several times to make the questions transparent 2. Researcher accuracy and reviewing the codes adopted from the interviews 3. Collecting sufficient information with theoretical saturation
Transferability: Degree of application research findings in other similar situations	1. Theoretical and purposeful sampling 2. The information on the subject under study is sufficient to assess the possibility of transferring the findings to similar situations 3. Theoretical concepts presented from the data obtained from all the interviewees of this study were extracted
Dependability: The degree of stability of the explanations made over time	1. Statement of current and previous experiences of experts on the research topic 2. Observance of methodological tools during the research 3. Comprehensive documentation of interviews through the systematic process of recording, recording, and writing interviews (Voice recording, interview implementation, and oral data writing)
Confirmability: The degree of objectivism of research and the avoidance of bias and prejudice by the researcher	1. Review interviews conducted and evaluate the researcher's interpretations by others 2. Expansion and refinement of interpretations by approving the summary of the model formulated by several experts.
Resonance: The researcher's ability to state meanings and analytical interpretations	1. Allocate sufficient time for the interview 2. Conduct interviews professionally and in a friendly atmosphere.
Usefulness: Practical aspects of research results	1. Applicability of findings in the development process of managers 2. The scientific contribution of findings in developing a native model.
Originality	1. Significance of findings in native contexts 2. Some of the research findings challenge existing concepts and ideas
Adjustability: The ability of the theory to continuously adjust	The stated model can modify and adjust over time based on new findings.

Table 3: Part of the code extraction process to generate the primary codes

Interviewee	Text Interview	Subject Codes
M11	From the beginning and the coronavirus outbreak, the leisure time of quarantine residents was discussed, especially since our encounter with this issue in Iran was associated with our Nowruz holiday. At that time, the government, educators, and other experts discussed how to spend these times; After this period, cultural, artistic, entertainment, and even religious centers were closed, from cinemas to mosques.	Closure of cultural, artistic, and entertainment centers
M12	Corona has affected all aspects of our lives, from the individual and the personal to the macro, world, and social aspects; As a result, we need to address this issue and consider the aspects and experiences of others.	Learn from the experiences of others
M14	In Iran's social and cultural spheres, from the beginning, we had challenges between different social forces in the face of corona restrictions, which eventually led to a national corona crisis headquarters to decide for all sections of society. There was a dual view that, in some places, the health issue took precedence over the religion issue, and this created a conflict of opinions.	Partialism
M13	The virus has developed new variants, of which lambda is the newest type of corona mutation. Lambda has high transmission power and more safe evasion, so it causes more disease and severity in children. It is more resistant to the vaccine, but we still need more and better information about it.	High spread speed
M9	The notion that the transmission of the coronavirus from the surface is less effective is a fact. Of course, the amount of viruses on the surface that can cause infections is minimal in a common space. This apprehension and concern that people have about this and that they disinfect everything is not valid. However, in hospitals with covid or ICU covid wards, the contamination is high, and the surfaces must be disinfected; The persistence of the virus in these places is the same as before.	Learning
M6	Our fault is not to prevent the crisis. We put all our time and grief into controlling the crisis, but we must prevent the crisis and not let the situation get to the point where there is too much pressure on the medical staff. We must have forecasts based on accurate information to avoid a crisis. We have to slow down this process with non-therapeutic measures, which have been done very little so far.	Thinking
M5	We had an excellent experience controlling the corona in the form of the Soleimani plan, but we do not know why the plan failed; of course, this plan also had problems, but it must be modified and continued. This situation caused us to have two so-called abdomen-to-abdomen corona peaks, which may lead to another peak.	Process modification
M9	Common symptoms reported for the English strain are similar to other types; For example, fatigue (32% of people with English type), muscle pain (25%), fever (21%), or sore throat (21%). These levels of symptoms are similar to the levels of other strains.	Symptoms of coronavirus
M5	It should be said that there are different issues in one case. In many cases, the virus infects a person, and the person does not notice and gets better. About 1% of people may have mild symptoms such as headache, sore throat, and slight body aches. There is also 1% of people who have mild symptoms and do not need treatment, and these people get well at home with rest. Some people have symptoms but do not need to be hospitalized and can receive outpatient treatment. Some people also need hospitalization.	Symptoms of coronavirus
M3	Look, this virus has caused the closure of cultural and artistic centers. Most of the cultural industries and their activists, including the cinema industry and film production, theater, music, museums, etc., are facing many problems in these few months, these industries have huge losses, permanent closures, layoffs, and other professional and economic issues have been encountered, which shows the depth of the disaster if you pay attention to the statistics published in news agencies and publications.	Economic problems
M4	Policymakers should plan and prepare for future crises by analyzing the performance and activities carried out at every level and organization while evaluating the strengths and weaknesses. They should learn from what happens and plan for the future.	Learning from the environment
M10	Since this pandemic has affected all aspects of society, such as health and treatment, cultural, economic, and social, the exchange of information between organizations and government structures is essential. This issue means that society should fight this pandemic in a unified and together way.	Inter-organizational coordination and cooperation

present study results also indicate that the nonlinear property of systems should be used in formulating policies related to covid-19. Linear thinking views the outcome and the process that leads to it in the same location; however, when thinking is nonlinear and circular, all phenomena can give feedback to their generator. When thinking becomes circular, the phenomenon in that circle corrects itself; its input is something else we did not anticipate before.[18] So, in this case, some of the actions we have planned to take to reach a specific result may change over time, and the predicted results may not happen again because the feedback loop may have changed the system inputs. Therefore, in the long run, changes may occur. If we consider the social dimension and the behavior of citizens in the face of the covid-19, most people were terrified of this disease in the early days of this pandemic, and the observance of health policies was very high. However, over time, this issue became normal for most people.

Most people's fears decreased compared to the early beginning of the pandemic, and health practices declined. Therefore, the policies initially designed

Table 4: Classification of basic themes and their relationship with the main themes

Main themes	Basic themes
Spread speeds in different mutations	Faster transfer in Delta type
The time interval between the extent of involvement of individuals and the incidence of symptoms in patients	Increase the rate of involvement/ incidence of new symptoms
Length of hospitalization of patients	Changes in the time of discharge
The severity of the damage in any mutation	Respiratory limit symptoms
Rate of hospitalizations in any mutation	2 to 3 days / more than two weeks
Rate of deaths in any mutation	Change the death rate
Symptoms of the virus in different mutations	Sore throat/fever/loss of smell
Age groups involved in any mutation	Involvement of older people/involvement of people under 40
How to detect new mutations	New diagnostic kits
Health departments	Hospitals/Health Centers
Economic sectors	Financial markets, labor market, energy, and travel market, and tourism industry
Social sections	Social groups such as women, children, small business owners, and immigrants
Political sections	Methods of governing in the time of the corona/how to persuade
Cultural sections	Cinema/sports/tourism
Educational sections	Student education/student education/other education
Informing sections	Broadcasting/cyberspace
Learn from the covid-19 behavior	Speed of spread/involvement rate/treatment methods
Learning from the environment	How to prevent the transfer/using the experiences of others
Clever initiative and opportunism in the face of a pandemic	Preventive action/precede in the face of the virus
Thinking over time	Evaluation of virus symptoms in different mutations/evaluation of effective drugs during treatment

Table 5: Relation of main and comprehensive themes with each other

Comprehensive themes	Main themes
Information on the Covid-19	Spread speeds in different mutations
	The time interval between the extent of involvement of individuals and the incidence of symptoms in patients
	Length of hospitalization of patients
	The severity of the damage in any mutation
	Rate of hospitalizations in any mutation
	Rate of deaths in any mutation
	Symptoms of the virus in different mutations
	Age groups involved in any mutation
	How to detect new mutations
Sections involved with Covid-19	Health departments
	Economic sectors
	Social sections
	Political sections
	Cultural sections
	Educational sections
	Informing Sections
Framework for formulating policies	Learn from the Covid-19 behavior
	Learning from the environment
	Clever initiative and opportunism in the face of a pandemic
	Thinking over time

based on the earlier situation should change with the current situation because inputs have changed based on the thinking and nonlinear system. Also, during the early-covid-19 period, the rate of spread and onset of symptoms was longer. However, in new mutations, the rate of spread is higher, and the onset of symptoms occurs at shorter intervals.[19, 20]

Before a variant appears, policymakers must formulate new policies based on new variants being reported anywhere in the world, such as the duration of an individual's infection, infection rate, age groups exposed to the new infection, its new symptoms, and other characteristics. For example, if new variants engage lower age groups, policies related to new-age groups will be added.

The corona crisis reminds us of the value and necessity of systems thinking.[21] The reasons for failure against the virus have been the approach to planning, the unbalanced development pattern, and the lack of information and knowledge. According to the first

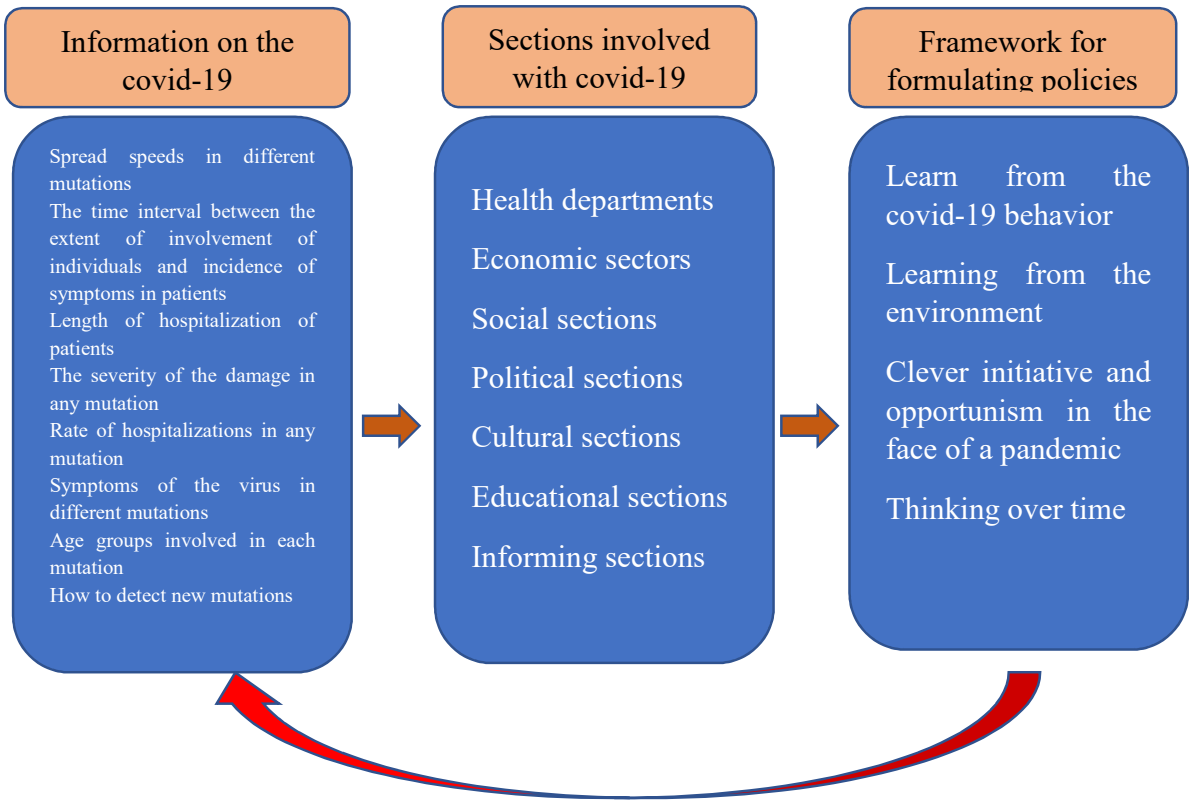

Figure 1: The pattern of policymaking in covid-19.

principle of systemic thinking, "Today's problems come from yesterday's solutions," so policymakers should know that every decision they make today will cause problems in the future. The more accurate the decisions are made and all aspects of the problem are considered, the better the results will be. Another principle of systemic thinking is that "simplistic solutions usually do not lead anywhere," that is, adopting cross-sectional and short-term policies and behavior may have good effects at first. But, if we consider them as an introduction and a foundation for the future, they will lead to dire results.

Managing the time of infection and infection peak is very important from the government policymaking perspective and should be considered due to limited resources.[22] Post-corona policy assessments of the prevalence of the epidemic and the impact of measures such as public closures and quarantine should include a comprehensive analysis beyond examining health indicators. They should also assess the role of vital demographic indicators such as age and family structures, patterns of cohabitation, and individual characteristics such as socioeconomic status, ethnicity, and displacement.

Preparedness for future crises begins with a summary analysis of the performance of organizations, individuals, and inter-organizational activities conducted during the previous stage. It is also necessary to evaluate the strengths and weaknesses of the system at this stage. In the next step, it is necessary to ensure the adequacy of personnel, technology, and resources needed for possible emergencies in the future. Failure at this stage can lead to anxiety and decreased staff performance. The personnel training to deal with this pandemic should also focus on clarifying roles, accountability, coherence in decision-making, allocation of resources, communication skills in crisis, and adaptability in different situations.

Another important policy in this pandemic is reviewing and prioritizing the provision of services, especially examining the deprived and vulnerable groups that have received less attention and clarifying their needs. Using a regular iterative cycle that evaluates priorities, a balance can be achieved between the benefits and improvements and the harm caused to these people through continuous changes. It is very necessary to encourage people by setting goals and a road map, as well as mentioning that at any moment, we may need to change; this default can prevent people from giving in to an unpleasant event.

Exchanging information with different organizations and informing personnel about long-term health and treatment structure changes is also necessary as part of public health strategies.

The ultimate goal of the policy development should be human security. If we treat security partially rather than holistically, we provoke conflicts. Water security is opposed to food security, and health security is opposed to economic security.[23] Thus, the right decisions are not made, and priority must be set.

These prioritizations can also be immoral or incorrect or may lead to new crises. A person who works in the military and intelligence fields cannot succeed without the cooperation of experts in water, health, economics, and other fields. Similarly, environmentalists and water activists should know they cannot change without reforming the country's economic development model.

If we have to change the water field, we must understand the cultivation pattern and its change, and in the case of the coronavirus, these cases must also be considered. In short, if we put these together, the loser will be society and humans.

Suggestions

1. Because this pandemic has numerous consequences in other fields of human and social life, policymakers must use various disciplines, including medicine, economics, management, psychology, sociology, communication sciences, etc., to deal with it.

2. In the developed policies, attention should be paid to evaluating the performance of teams and organizations; this includes evaluating the management of the structure, forces, planning, costing, and balancing the presence of people against time flexibility or virtual care and training. These discussions aim to examine the measures taken to strengthen the care, personnel participation, capacities, and tolerance of these organizations and individuals.

3. Discussing lessons learned, successful innovations, and intra-departmental and inter-departmental cooperation sustainably are of great importance. It is also important to welcome people's creativity and use it to create a safe space for progress It will give access to pre-determined possible solutions when new problems arise.

4. Policymakers, managers, and personnel of organizations in different areas of the health system can participate in building a better future for society by distributing management, setting goals, and cooperation. Institutionalizing certain requirements and grounding them in the dominant culture of a society can ensure that the benefits of flexibility, impact, adaptability, capacity, creativity, strategic foresight, and distributed management continue long after the pandemic.

Conclusion

Due to the interdependence of economic, social, and cultural systems in formulating policies related to covid-19 for dealing with systemic threats and helping prevent systemic collapse, all aspects must be considered systematically.

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Ethics Declaration

This study was approved by the Ethics Committee of the Urmia University of Medical Sciences (IR.UMSU.REC.1399.015). http://ethics.research.ac.ir/IR.UMSU.REC.1399.015

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