



# Identification and Evaluation of Covid-19 Control Strategies in Kashan Schools Using SWOT and QSPM Matrix

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Received 2022 May 21; Revised 2022 September 19; Accepted 2022 October 19.

## Abstract

**Background:** Since the end of 2019, the emergence and spread of the Covid-19 pandemic has been raised as one of the challenges and problems of humanity in various dimensions, especially in the health sector. Due to the disease's high infectivity, controlling and breaking the chain of infection is especially important for vulnerable groups. Therefore, the present study was conducted to identify and evaluate Covid-19 control strategies in schools in Kashan.

**Methods:** The present study is descriptive-analytical, using strategic management tools called strengths, weaknesses, opportunities, and threats (SWOT) and a quantitative strategic planning model (QSPM) of the situation of schools during the Covid-19 pandemic in 2021.

**Results:** The findings from the SWOT matrix show the existence of 10 opportunities, 11 weaknesses, ten threats, and 14 strengths in the studied schools. The score of 2.45 obtained from the total scores of the internal factor analysis matrix indicates that existing weaknesses prevail over the schools' strengths in the disease control management field. Also, the score of 2.515 obtained from the analysis matrix of external factors shows that this institution has more favorable opportunities to reduce external threats and internal weaknesses.

**Conclusions:** Based on these findings, the final solution for implementing the methods of controlling the disease of COVID-19 in Kashan schools is a conservative strategy. Therefore, the implementation of the presented strategies, especially the implementation of related educational guidelines, is necessary to control Covid-19.

**Keywords:** Covid-19, Schools, Matrix, Strategy

## 1. Background

In late 2019, there was evidence of the emergence of a respiratory disease created by a virus in China, which spread rapidly across all countries around the world and was finally introduced by the World Health Organization as a new pandemic called COVID-19 (1). Coronavirus is a new type of virus that cause symptoms of colds to severe respiratory diseases (pneumonia), That had not been seen in man before. After the epidemic and the involvement of all countries, they are working on planning to prevent and control the disease (2). Following the outbreak of the Coronavirus, to reduce and counter the outbreak of the disease, China and then other countries closed schools.

Considering the importance of schools in Iran as one of the most important gathering centers, which always requires health controls (3). in late February, after the spread of Corona, the Ministry of Science and the Ministry of Education have been closing universities and schools on a successive basis; after this holiday, the prevalence of the disease has declined, and schools and universities have begun their activities (4).

The Coronavirus required health controls in schools, which was affected by these preventive measures; the issue of courses management and learning processes around the world and in order to reduce rallies, the use of modern communication technologies was raised that changed the learning and implementation systems of distance educa-

tion, online learning and electronic education in schools (5). The use of electronic devices, including computers, video, audio, virtual, and network, in the education process as e-learning (6). Benefits and constraints of e-learning include classroom independence at a specific time, comprehensiveness, learning, dynamism, up-to-date and educational needs at the desired time, and reduced cost and time (7). It also pointed to the high costs of launching and using computer equipment, the loss of cultural diversity and the absence of physical presence, and the use of tone language to give a fray (8). Therefore, educational experts and regulations repeatedly emphasized the re-implementation of in-person education. However, the World Health Organization and Disease Control and Prevention Centers (CDCs) and the Ministry of Health have prepared numerous health protocols to prevent and control COVID-19 for educational centers and students (9-12). However, various problems, such as the inadequate structure of some schools and the lack of personal protection equipment (PPE) (13, 14), It has caused severe increase in the number of infections patients and their negative consequences. So, the effective control and prevention management within these centers is necessary. For this reason, identifying and controlling the factors affecting the prevention of Corona in schools is essential to the use of efficient management theories. The most efficient methods of analyzing and evaluating organizations include the SWOT and QSPM matrix. SWOT initially; was used for overall systematic analysis in educational and managerial organizations (15). The QSPM matrix is also one of the common ways to evaluate strategic options and identify the relative attractiveness of the strategies used in decision-making (16). This requires managers to use more care and attention in weighting the criteria identified by SWOT and its analysis (17). This way, the best strategies are prioritized by quantifying sub-strategies (18).

## 2. Objectives

Now, due to the undesirable condition of the COVID-19 world in all countries of the world and the problems and challenges associated with environmental monitoring and health control of the illness in educational centers, The aim is to Identify and evaluate COVID-19 control strategies in Kashan schools using the SWOT and QSPM matrix.

## 3. Methods

The current study is a descriptive-analytical study using the internal and external environmental evaluation technique (SWOT and the QSPM) Model of Schools during the COVID-19 epidemic in 1399.

### 3.1. Identify Strengths, Weaknesses, Opportunities, and Threats

The first step of this study was to evaluate the current situation, based on library studies and field studies, to identify all internal strengths and weaknesses and external opportunities and threats. Books and health instructions were read to get better acquainted with school health, and then schools were visited. Environmental health workers conducted SWOT preliminary learning and its importance in health prevention for 25 school officials, and an expert team was formed. Then 25 school experts and administrators identified weaknesses, strengths, threats, and opportunities in 4 sessions.

In these meetings, the process of identifying and prioritizing factors affecting the spread of covid-19 was carried out by brainstorming and according to the school health checklists as well as the preventive knowledge and experiences of experts. These factors are recorded in Excel form.

The participants were 25 school administrators and health officials who had more than 15 years of experience, and their ages were between 50 - 38 years old. Environmental health experts who were proficient at school health inspections conducted the training.

### 3.2. SWOT Matrix Formulation Based on Registered Criteria

In the initial phase, the factors affecting the release of Corona in schools were categorized into four SWOT matrix groups, then evaluated internal and external factors (EFE) and prioritization of these issues based on their importance. In weight gaining and expressing the importance of each external strategic factor (threats and opportunities) and internal strategic factor (weaknesses and strengths) to factors of the highest importance, weight five and weight one were assigned to factors of the lowest importance. In order to normalize the weights specified in the previous stage, the coefficient of the validity of each internal or external factor was converted from a measure of one to five to zero and one because the sum of the coefficients must be one how the score is that the privilege of any strategic internal factor on a four-point scale (Very strong = four, strong = three, weak = two, and very weak = one) is determined by experts. The important point is the strengths of a score of 4 or 3 and the weaknesses of a score of 2 or 1. In this step, there is scoring on external strategic factors, except that scoring will be out of control due to the consistency power of the study. In other words, the factors that the study staff had a very good reaction with a score of 4, and the factors that were a very poor reaction were assigned a score of 1. According to the general guidelines, the degree assigned to the matrix of external factors is between 1 and 4 with an average of 2.5, with opportunities a score of 4 or 3 and threats 2 or 1. Finally, with the product of

the rank of importance and the designated privilege, the rhythmic privileges of the internal factors (strengths and weaknesses) and external (threats and opportunities) were obtained. Finally, if the sum of the Matrix Points of the Organizational Factors was less than 2.5, It means the organization's weakness, and if was a more than 2.5, this shows that the strength of the organization in terms of internal factors. Similarly, in the matrix of external factors, a score of less than 2.5 indicates the overtaking of threats, and a score of more than 2.5 indicates opportunities.

### 3.3. Developing Control Strategies

After determining the score of the matrix of internal and external factors, the type of strategy to improve the status was determined (Table 1). Four strategies are interpreted as follows (2, 19, 20):

- SO strategy (offensive; with the privilege of internal and external factors more than 2.5) that all organizations are interested in being in this situation so that they can take the utmost external opportunities by taking advantage of internal strengths.

- ST strategy (competitive; domestic factors more than 2.5 and external factors less than 2.5); in this strategy, the organization uses its internal strengths to counter external threats.

- WO strategy (conservative; internal factors rating less than 2.5 and external factors rating more than 2.5) in which the organization uses external opportunities to offset internal weaknesses.

- WT strategy (defensive, with a privilege for internal and external factors less than 2.5) This is a risky strategy for the organization, and it should strive to limit internal weaknesses and be aware of external threats.

Finally, health workers have proposed useful methods to resolve problems and strengthen the opportunities and strengths of the organization.

### 3.4. Prioritizing Strategies with QSPM

The quantitative strategic planning matrix (QSPM) is used to determine the relative appeal of desirable alternative strategies by monitoring internal and external factors. Scientifically, QSPM expresses the relative attraction of various strategies using strengths and opportunities to eliminate weaknesses and prevent or reduce threats (2022).

The attractive table was formed by referring to the strategies provided by environmental health employees and school administrators. Thus, the rating of the attractiveness of each strategy was determined by the importance of each internal and external factor.

In other words, the rating of attractiveness is expressed as a numerical value designed to be the relative attractiveness of each strategy in a set of strategic options and

demonstrates the importance of each factor and its range of 1 Up to 4 variables. The total attractiveness rating is obtained from the attractiveness score in the coefficient of the importance of each internal or external (EFE) (21, 22). Finally, the priority of strategies was calculated by the sum of the total value of the attractiveness of each strategy.

## 4. Results

The results of the SWOT matrix indicate 14 strengths, 11 weaknesses, ten opportunities, and ten threats in the schools under study (Tables 2 and 3). In total, 25 internal factors and 20 external factors were identified by the educational staff of schools with the guidance of environmental health experts. The most important strength of the classroom environment for the implementation of health protocols and the most important weakness of the delay in the implementation of health protocols. The lack of educational space was the vaccine of the system compared to the number of students, inadequate ventilation of classes and schools, and some households' lack of attention. The findings of this research determined that two factors of vaccination of school personnel and teachers and relative reduction of illness and design of assignments and performance tests with appropriate performance tests with the goals of education and culture, health issues among students are of the highest weight among the external opportunities of the system. However, the reduction of funding for disinfectants and disinfectants for some schools was recognized as the most effective threat to the organization.

The number of 2.45 of the total IFE matrix scores shows that the weaknesses of the existing weaknesses are the strengths of the school's understudy in the field of COVID-19. Of course, the proximity of this number to the numerical average of 2.5 determines a relatively low difference between strengths and weaknesses. Also, 2.515 from the EFE matrix determines that the organization has more opportunities to reduce internal weaknesses and external threats.

Based on the findings, the final strategy for implementing COVID-19 control measures in Kashan schools, A conservative strategy based on taking advantage of existing opportunities and reducing weaknesses to reduce the vulnerability caused by threats (Figure 1). Therefore, extracting conservative strategies (WO) is a priority in preparing strategies.

After determining the strategic status of the schools in the matrix of internal and external factors evaluation, the integration phase attempted to introduce effective strategies to improve the existing conditions by using Tables 1 and 2. The strategies selected based on SWOT analysis were weighed by environmental health employees using

**Table 1.** SWOT Matrix

SWOT	Strong Point (S)	Weakness Points (W)
Opportunity (O)	Area 1- Offensive strategies (SO)	Area 3- Conservative strategies (WO)
Threats (T)	Area 2- Competitive strategies (ST)	Area 4- Defensive strategies (WT)

**Table 2.** Internal Factors Assessment Matrix (IFE)

Row	Strengths	Importance Coefficient	Rank (3), (4)	Rating = Weight × Rank
S1	Existence of equipment necessary for the implementation of health protocols	0.06	3	0.18
S2	School cadre health awareness	0.05	3	0.15
S3	Intensifying the school environment intensification of the school environment regularly and frequently	0.05	3	0.15
S4	Holding a series of family meetings focused on health issues in person and in person	0.04	3	0.12
S5	The proper status of the classroom environment for the implementation of health protocols	0.05	4	0.2
S6	The existence of a health expert in school	0.04	3	0.12
S7	Corona's initial screening between school executives as well as students	0.03	3	0.09
S8	Prohibition of entry into schools	0.04	3	0.12
S9	Student health control in the field of emotional and emotional support	0.04	3	0.12
S10	Sensitivity to personal hygiene by teachers and school staff	0.04	3	0.12
S11	Preparation of the right time plan for classes (preventing overcrowding)	0.04	4	0.16
S12	Illustration in different school spaces to maintain social distance	0.04	3	0.12
S13	Use single-person benches for sitting in class students	0.04	3	0.12
S14	Promotion of intellectual and creative games	0.03	3	0.09
Row	Weaknesses	Importance Coefficient	Rank (1), (2)	Rating = Weight × Rank
W1	Delay in the implementation of health protocols	0.05	2	0.1
W2	Lack of educational space than the number of students	0.05	2	0.1
W3	Cognitive Growth of Students in Elementary Schools	0.03	1	0.03
W4	The misconception of some school cadres toward health issues	0.03	1	0.03
W5	Inappropriate ventilation of classes and schools	0.05	2	0.1
W6	Defects in disinfection of educational space by school servant	0.03	2	0.06
W7	The lack of a dominant health instructor in some schools	0.03	2	0.06
W8	The presence of a student's parents in the school courtyard (neglect of protocols)	0.03	1	0.03
W9	Lack of attention to some households the vaccine	0.05	2	0.1
W10	Lack of designing appropriate educational programs for students' physical education unit and lack of proper alternatives to it	0.02	1	0.02
W11	Failure to pay attention to hidden education by teachers and coaches	0.03	1	0.03
Total		1		2.45

the QSPM matrix, and the attractiveness of these was determined (Table 4).

## 5. Discussion

Given the importance of school health in the control of disease among students and the high vulnerability of

this age group, the purpose of this research was to evaluate and investigate the COVID-19 control strategies in Kashan schools using the SWOT and QSPM matrix. So far, no study has been conducted on identifying and evaluating COVID-19 control strategies in schools. But studies have been conducted in other organizations during the Pandemic era of

**Table 3.** External Factors Assessment Matrix (EFE)

Row	Opportunities	Importance Coefficient	Rank (3), (4)	Rating = Weight × Rank
O1	Vaccination of school personnel and teachers and relative reduction of illness	0.06	4	0.24
O2	Automation of administrative and organizational processes, especially in the education	0.04	4	0.16
O3	Increase inspection of health experts from school and school health conditions	0.07	3	0.21
O4	Activate knowledge-based companies to replace virtual education according to school conditions during the Corona era	0.06	3	0.18
O5	Special and special attention to the margins to increase their awareness of health behaviors by policymakers	0.05	3	0.15
O6	Using a variety of capacities, such as mobilization and mobilization of mosques and universities in the education and prevention of Corona Disease in Schools	0.55	3	0.165
O7	Easy access to the results of various research on health education to children during the Corona era	0.04	3	0.12
O8	Designing homework and performance tests with the goals of education and culture of health issues among students	0.55	4	0.22
O9	Increase media capacity for remote education in audiovisual	0.04	3	0.12
O10	Holding meetings for managers on the issue of health through education	0.03	3	0.09
Row	Threats	Importance Coefficient	Rank (1), (2)	Rating = Weight × Rank
T1	Failure to allocate funds for disinfectant and disinfectant for some schools	0.07	2	0.14
T2	Failure to comply with some schools of general principles by the Department of Education	0.05	2	0.1
T3	Existence of contradictory comments on the prevention of corona	0.04	2	0.08
T4	Reducing students' mental health due to the lack of complete counseling beds	0.04	1	0.04
T5	The existence of wrong patterns in the community for students in terms of behavior and unhealthy speech	0.05	2	0.1
T6	The existence of various sanctions for the introduction of advanced health supplies and equipment needed for the school	0.06	2	0.12
T7	Holding free training classes (entrance exams, language) regardless of protocols against school closures	0.05	2	0.1
T8	Incomplete awareness and attitude of departments toward prevention	0.04	1	0.04
T9	Failure to implement environmental health protocols by school services drivers	0.05	2	0.1
T10	Parents' misconceptions about establishing in -person classes	0.04	1	0.04
	Total	1		2.515

**Table 4.** Prioritization of Selected Strategies

Row	Selected Strategy	Attractive Score	Priority
1	System structuring and provision and upgrading of infrastructure equipment and facilities	6.65	4
2	Providing and upgrading health educational guidelines for teachers and students	6.82	1
3	Recruitment of a health instructor in schools	6.71	2
4	Developing and improving school and office cooperation	6.62	3
5	Tracking, deploying, and developing long-distance education systems	5.97	5

COVID-19. One of the studies by SWOT in the field of health and COVID-19 by Gholami in 1399, The formulation of urban crisis strategy and management focused on combating the Coronavirus with the emphasis on the role of professional health experts and HSE by SWOT matrix method

studied: Shazand city (23). The title of formulating an effective strategy in the Coronavirus crisis management was emphasized by the role of NAJA in the Matrix (Case Study of Hamadan County) By calculating the final privileges for internal factors (strengths and weaknesses) and external

Internal and external factors matrix			
Internal factors score			External factors score
1	2.5	4	
Conservative		Aggressive	
	•		
Defensive		Competitive	
			1

Figure 1. The strategic position of Kashan schools

(opportunities and threats) identified a favorable strategy for managing the COVID-19 virus crisis in Hamadan is a defensive strategy. In this regard, strategies such as developing a comprehensive crisis management program with the COVID-19 virus with the consultation of urban management specialists, and law enforcement, intensifying monitoring of hygiene protocols in people's gathering centers, appealing to the public transport fleet movement to reduce the number of passengers at stations and in transportation equipment, were provided in Hamadan (24). In a matrix of internal and external factors, weighing any of the SWOTs specified in the present study depends on the conditions of each region or country, so different answers can be achieved. According to the results in the matrix of internal and external factors, the total weight score column for external factors, including opportunities and threats, was 2.515, and for internal factors, including strengths and weaknesses, it was 2.45. Therefore, considering that both numbers are close to 2.5 acceptable values, it is necessary to plan to improve the control performance in similar encounters with Covid-19 in Kashan schools. Regarding the strengths and weaknesses, there is a relatively low difference between strengths and weaknesses, but the weaknesses are bolder than the strengths, and therefore the weaknesses should be reinforced and strengthened. The most important strengths of the classroom environment for implementing health protocols were: the necessary equipment for implementing health protocols and preparing the appropriate time for classes (prevention of congestion), and the most important weaknesses in the implementation of health protocols, lack of educational space over the number of students, inadequate

ventilation of classes and schools, and the lack of attention by some households to the vaccine were identified. At the beginning of the spread of this disease, however, lack of knowledge about how the virus spreads and the confusion of managers in the methods of dealing with the Coronavirus caused some irregularities in the management of the illness, which is one of the threats to the system. As to analyzing external factors, it can be expressed that Kashan schools have more opportunities to reduce internal weaknesses and external threats, which should be properly taken to take advantage of opportunities. The most important identified opportunities for schools and teachers included vaccination and relative reduction of illness, an increased inspection of health experts from school and School health conditions, and design assignments and performance tests with educational and cultural goals of health issues among students, and the most important threats to the lack of funding for disinfectants and disinfectants for some schools and the existence of various sanctions for the introduction of advanced health equipment needed for the school.

#### 5.1. Conclusions

According to the findings, the final strategy for implementing COVID-19 control regulation in Kashan schools is a conservative strategy based on reduced weaknesses and the use of existing opportunities to reduce the damage caused by threats. Accordingly, adopting strategies such as providing and upgrading health educational guidelines for teachers and students, system structure, providing and upgrading equipment and facilities, recruiting school health coaches, schools Developing and improving school and offices' outsourcing partnerships, and the pursuit, deployment, and development of telecommunications systems should be on the agenda. Given that this study used SWOT for the first time in the school of school health during the COVID-19 pandemic, the results cannot be compared with the results of other studies. According to these cases, it is suggested to design and implement the system for identifying weaknesses and threats of opportunities in line with health crises, while having a desirable monitoring structure to ensure the results.

#### Acknowledgments

Thanks to all staff of the Department of Education and Schools of Kashan who have helped us do this research.

#### Footnotes

**Authors' Contribution:** Study concept and design: Mohammad Ghorbanalizadeh Jamal; acquisition of

data: Alireza Ziloui; analysis and interpretation of data: Mohsen Hesami Arani; drafting of the manuscript: Moin Rezaei Ghamsari; critical revision of the manuscript for important intellectual content: Abolfazl Kazemzadeh Nooshabadi; statistical analysis: Hadi Niknejad; administrative, technical, and material support: Ameneh Marzban; study supervision: Mohsen Dowlati.

**Conflict of Interests:** The authors have no conflict of interest.

**Funding/Support:** This study did not support financially and was implemented at the authors' personal cost.

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