

SWOT Analysis in Sina Trauma and Surgery Research Center

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Abstract- The present study was conducted with the aim of identifying and evaluating the internal and external factors, affecting the Sina Trauma and Surgery Research Center, affiliated to Tehran University of Medical Sciences and propose some of related strategies to senior managers. We used a combined quantitative and qualitative methodology. Our study population consisted of personnel (18 individuals) at Sina Trauma and Surgery Research Center. Data-collection tools were the group discussions and the questionnaires. Data were analyzed with descriptive statistics and SWOT (Strength, Weakness, Opportunities and Threats) analysis. 18 individuals participated in sessions, consisting of 8 women (44.4%) and 10 men (55.6%). The final scores were 2.45 for internal factors (strength – weakness) and 2.17 for external factors (opportunities – threats). In this study, we proposed 36 strategies (10 weakness – threat strategies, 10 weakness – opportunity strategies, 7 strength – threat strategies, and 9 strength – opportunity strategies). The current status of Sina Trauma and Surgery Research Center is threatened weak. We recommend the center to implement the proposed strategies.

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Introduction

The academia needs to adopt a strategic view to assess their current status and also state their visions and missions based on their strengths, weaknesses, opportunities, and threats to define their objectives. Therefore, they may be able to respond to the needs of the society through related operational plans (1). Indeed, strategic planning is the process through which the goals of an organization are defined and decisions are made regarding comprehensive operational and executive plans required to realize them (2). An essential step in strategic planning involves collection of data concerned with the strengths and weaknesses (internal factors) and the opportunities and threats (external factors), which confront a university or organization. Any efficient strategy takes advantage of strengths and opportunities while it simultaneously abolishes or reduces weaknesses and threats (3). It constitutes an essential managerial tool that is used for strategic planning, as well as policy making and resolving problems. Through this assessment, future orientation will be determined;

priorities will be defined, essential decisions will be made, organizational efficacy will be improved, and efficient approaches will be adopted under rapid changing circumstances (4). The entire activities of the organization are performed in its external and internal environment. An accurate understanding of influential factors in these environments will help the planning team to find ways to improve the organization. In general, the factors influencing an organization are divided in two categories, based on their mode of influence:

- a) Those which influence the organization directly from within
- b) Those which influence the organization from outside on a large scale

Identification and analysis of each internal or external factor will lead to the development of a list of weaknesses and strengths (resulting from analysis of internal factors) and opportunities and threats (resulting from analysis of external factors). For this purpose, the popular “SWOT analysis model and recommendation of large and small-scale strategies” is the frequent model

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used for strategic planning due to its simplicity in understanding and conduct. It is a brief and useful analytic model which systematically identifies each of the strengths, weaknesses, opportunities and threats that reflect the appropriate strategies for the present status.

We can describe each of items as follows:

Strength is an item which grants a positive advantage or considerable capability to the organization.

Weakness is an element which entails a negative score or disability for the organization.

Opportunity is a potential which will direct the organization to grow in a positive way or will grant considerable advantages to the organization, if it implements. In other words, it is a potential benefit which has not been realized yet.

Threat is a factor which will hinder the organization from growing and thriving. In other words, it is a potential harm which has not been realized yet.

The data is collected through the process of assessment will often lead to the identification of strategic problems (5). The main outcome of internal and external strategic (SWOT) analysis is to improve the organization based on strengths, visualize the weaknesses, take advantage of opportunities, and counteract threats (6, 7). Internal and environmental analysis enables the organization to identify its competitive weaknesses and competences, respectively, objectively and precisely. The resulting data will help managers to invest on competitive opportunities and diminish the impact of threats and obstacles. Identification of competencies and weaknesses enables the organization to adopt proper strategies for confronting environmental forces (8).

Sina Trauma and Surgery Research Center (STSRC) is a multi-disciplinary research center, affiliated to the Tehran University of Medical Sciences (TUMS), and focused on the study of trauma and surgery. STSRC is one of the oldest research centers in TUMS and established in Sina Hospital. The present study was conducted to identify and assess the internal and external factors of STSRC and propose some of related strategies to senior managers.

Materials and Methods

Considering the objectives of the study, we used both quantitative and qualitative methods for SWOT analysis based on focus group discussions (FGD). Since the number of participants was small, we recruited all 18 individuals working in Trauma Research Center without sampling. They were two

associate professors (1 neurosurgeon and 1 community medicine specialist), one assistant professor (an epidemiologist), two general practitioners, six Bachelor of Science researchers and nine diploma clerks. Except one of the associate professors, all of them were full time.

We used brainstorming to identify the internal factors (strengths, weaknesses) and external factors (opportunities, threats). In the next step, all internal and external factors were studied, and those which seemed similar were merged to yield a total of 34 strengths, 30 weaknesses, 39 opportunities, and 38 threats. Ultimately, we prepared the internal factor evaluation matrix and the external factor evaluation matrix. Then, the personnel attributed both a weight and a rating score of the present status to each factor. 5 figures were considered for weights: 1=unimportant, 2=low importance, 3=medium importance, 4=high importance, 5=very high importance. The present status of each factor was defined using a rating score of 1 to 4, as follows: weaknesses could only receive 1 or 2 (1=very weak, 2=weak), while strengths could only receive 3 or 4 (3=strong, 4=very strong). Similarly, threats could only receive 1 or 2 (1=serious threat; 2=considerable threat) while opportunities could only receive 3 or 4 (3=considerable opportunity; 4=golden opportunity). Subsequently, the weights were normalized to yield a weight of 0 to 1 for each factor and a total weight of 1 for all factors. The normalized weights were multiplied by the rating scores of the present status to obtain weighted scores.

The sum of weighted scores was calculated to determine the current status of the organization (strong with opportunity – threatened strong – weak with opportunity – threatened weak). Later, the top 10 items of strengths, opportunities, weaknesses, and threats were acquired; combination of these items yielded the matrices of strength-opportunity, strength-threat, weakness-opportunity, and weakness-threat. In the next step, the personnel were required to study these matrices carefully and define related items. Once the matrices were completed, the strongest relationships were used to develop proper strategies, ultimately yielding four groups of strategies – strength-opportunity (SO) strategies, strength-threat (ST) strategies, weakness-opportunity (WO) strategies, and weakness-threat (WT) strategies. In the final step, strategies were prioritized based on 7 criteria (feasibility, effectiveness, costs, acceptance by stakeholders, concordance with other plans, compatibility with missions and long-term impact) and

the participants were asked to provide a rating of 1 to 4 for each of these criteria: 1=low, 2=medium, 3=high, 4=very high, except in the case of costs where 1=very high, 2=high, 3=medium, and 4=low. Afterwards, the ratings were added up, the mean rating of each strategy was determined and the strategies were prioritized.

Our study complied with the recommendations of the Declarations of Helsinki and Tokyo guidelines and was approved by our institutional ethics committee. All of the subjects gave verbal consent.

Result

A total of 18 individuals participated in sessions,

consisting of 8 women (44.4%) and 10 men (55.6%). The following items were identified:

Strengths: A total of 34 strengths were acquired, with the top 10 (in terms of ratings) presented in table 1. The most important factor of strengths was website.

Weaknesses: A total of 30 weaknesses were acquired, with the top 10 (in terms of ratings) presented in table 1. The most important factor of weaknesses was the lack of ample motivations.

Opportunities: A total of 39 strengths were acquired, with the top 10 (in terms of ratings) presented in table 2. The most important factor of opportunities was high burden of trauma in Iran and worldwide.

Table 1. Internal factor evaluation (IFE) of Sina Trauma and Surgery Research Center

Internal Strategic Factors	Weight	Rating of Present Status	Weighted Score
Strengths			
Website	0.026	3.22	0.083
Eminent personnel	0.021	3.61	0.075
Healthy environment	0.020	3.72	0.075
Independence	0.020	3.67	0.074
Fulltime and prominent faculty	0.016	3.61	0.060
Technical capabilities	0.017	3.44	0.058
Timely payment of salary for personnel	0.016	3.44	0.057
Subsidiary of the primary university of medical sciences (university of Tehran)	0.016	3.50	0.056
Ample budget	0.017	3.28	0.055
Numerous empty organizational rows	0.015	3.44	0.044
Weaknesses			
Lack of ample motivation	0.020	1.68	0.034
Insufficient presence of center's director	0.020	1.50	0.030
Lack of clearly defined responsibilities	0.019	1.50	0.029
Lack of a council system for making decisions	0.016	1.72	0.028
Inappropriate physical location	0.019	1.44	0.028
Lack of interventional and practical research projects	0.018	1.44	0.027
Lack of strategic plan	0.018	1.39	0.026
Long duration of work process	0.017	1.50	0.026
Workforce is not employed according to organizational chart	0.017	1.50	0.026
Weak communications with university headquarters	0.018	1.56	0.025
Sum	1	2.45	2.45

Weight: 1-unimportant; 2-low importance; 3-medium importance; 4-high importance; 5-very high importance

Rating of weaknesses: 2-weak; 1-very weak

Rating of strengths: 4-very strong; 3-strong

Threats: A total of 38 strengths were acquired, with the top 10 (in terms of ratings) presented in Table 2. The most important factor of threats was the problem that managers of Sina Hospital did not consider the research center as a part of the hospital.

The final score of internal factors (strengths – weaknesses) was 2.45, with 8 individuals (44.5%) describing the trauma research center as strong, and 10 individuals (55.5%) describing it as weak.

The final score of external factors (opportunities-threats) was 2.17.Regarding the external factors, 3

individuals (16.7%) believed that the trauma research center has an opportunity, while 15 individuals (83.3%) were of the opinion that it is being threatened.

The prioritized strategies, from the participants' point of view, are as follows:

Weakness-Threat strategies (Defensive): A total of 10 defensive strategies were selected and prioritized (Table 3).

Weakness-Opportunity strategies (Rehabilitation): A total of 10 rehabilitation strategies were selected and prioritized (Table 4).

Strength-Threat strategies (Diversity): A total of 7 diversity strategies were selected and prioritized (Table 5). of 9 expansion strategies were selected and prioritized (Table 6).

Strength-Opportunity strategies (Expansion): A total

Table 2. External factor evaluation (EFE) of Sina Trauma and Surgery Research Center

Internal Strategic Factors	Weight	Rating of Present Status	Weighted Score
Opportunities			
High burden of trauma in Iran and Worldwide	0.015	3.26	0.051
Political commitment of high-ranking Iranian officials regarding trauma	0.015	3.21	0.049
Importance of trauma for people and authorities	0.014	3.26	0.046
Lack of trauma system in Iran	0.014	3.11	0.045
Possibility of using the experience of other experts	0.013	3.21	0.043
Possibility of conducting national research projects	0.013	3.21	0.043
Possibility of promotion for personnel	0.012	3.32	0.042
Availability of international organizations	0.013	3.11	0.043
Location in capital	0.013	3.26	0.042
Possibility of providing appropriate physical location	0.013	3.11	0.042
Threats			
Managers of Sina Hospital do not consider the research center as part of the hospital	0.023	1.47	0.034
Annulment of the center	0.016	1.47	0.024
Low budget and benefits from university	0.013	1.47	0.020
Lack of international bonds weakens the center	0.012	1.90	0.022
Lack of participation of university authorities in research projects of the center	0.014	1.53	0.022
Occupation of organizational positions by people outside the center	0.013	1.68	0.022
It is not clear who is the main administrator for trauma issues in Iran	0.013	1.58	0.021
Lowered budget of the center	0.014	1.42	0.021
Confrontations between the trauma center and the hospital	0.013	1.63	0.021
Lack of extra budget	0.012	1.63	0.020
Sum	1	2.17	2.17

Weight: 1-unimportant; 2-low importance; 3-medium importance; 4-high importance; 5-very high importance

Rating of threats: 2-considerable threat (bad and negative reaction); 1-serious threat (very bad reaction);

Rating of opportunities: 4-golden opportunity (excellent reaction); 3-considerable opportunity (good reaction)

Table 3. Weakness-threat strategies (Defensive)

#	Strategies	Feasibility	Efficiency	Costs*	Acceptance by Beneficiaries	Concordance with other plans	Compatibility with missions and objectives	Long-term Impact	Total
1	Preparing the center's strategic plan	3.2	3.3	2.6	2.9	3.1	3.4	3.4	21.9
2	Holding meetings between authorities of the center and Sina Hospital to work out the problems	3.3	3.1	3.4	3	2.9	2.9	3.3	21.9
3	Submission of periodic reports of activities to university director and deputy of research	3.4	3.3	3.6	3.1	3.1	3.3	3.2	23
4	Summoning research projects and facilitating the process of approving research projects	3.2	2.9	2.7	3.3	3	3.2	3.4	21.7
5	Establishment of international affairs in the center	2.4	2.6	2.6	3	2.8	2.9	2.8	19.1
6	Establishment of committee of suggestions and critiques with representatives of the center	2.8	3	3.4	2.9	3	2.9	2.9	20.9
7	Preparing procedure flowchart for activities of the center	3.1	2.9	3.3	2.8	2.8	2.9	2.9	20.7
8	Supervising the process of employment according to the organizational flowchart	2.6	3.3	2.6	3.2	3.4	3.1	3.1	21.3
9	Preventing the occupation of organizational positions in the center by individuals outside the center	2.9	3.3	3.1	3	3.1	3.2	2.9	21.5
10	Preventing confrontations with hospital authorities	3.2	3.1	3.4	2.9	3	2.9	2.9	21.4

1= low; 2= medium; 3= high; 4= very high

* 1= very high; 2= high; 3= medium; 4= low

** This table was completed by 16 participants

Table 4. Weakness-opportunity strategies (Rehabilitation)

#	Strategies	Feasibility	Efficiency	Costs*	Acceptance by Beneficiaries	Concordance with other plans	Compatibility with missions and objectives	Long-term Impact	Total
1	Increased presence of center's director	2.9	3.5	3.4	3.6	3.6	3.5	3.3	23.8
2	Inviting professors and experts to participate in the meetings of research council	3	3	2.9	2.8	3.1	3.2	3.2	21.2
3	Advocating transfer to a more appropriate physical location	2.7	3.2	2.2	2.8	3	2.8	3	19.7
4	Reinforcing relations with university headquarters	3.2	3.4	3.2	3.1	3	3.1	3.3	23.3
5	Using comments and critiques to enhance efficiency	2.9	3.3	3.1	3	3.1	3.2	3.1	21.7
6	Publishing the research results for the public	3	2.9	2.4	2.8	3	3.1	3.1	20.3
7	Using proper motivational systems for personnel of the center	3.2	3.4	2.9	3	3.1	3.3	3.4	22.3
8	Preparing a clear set of responsibilities for each member of personnel	3.1	3.1	3.1	3.1	3.2	3.3	3.3	22.2
9	Prioritizing interventional and practical projects	3.1	3.1	2.8	2.9	3	2.9	3.1	20.9
10	Prioritizing national research projects	3.1	3.2	2	2.9	3	2.9	3.3	20.4

1= low; 2= medium; 3= high; 4= very high

* 1= very high; 2= high; 3= medium; 4= low

** This table was completed by 16 participants

Table 5. Strength-threat strategies (Diversity)

#	Strategies	Feasibility	Efficiency	Costs*	Acceptance by Beneficiaries	Concordance with other plans	Compatibility with missions and objectives	Long-term Impact	Total
1	Completing and expanding the STDB database	3.1	2.6	2.4	2.8	2.8	3.1	2.9	19.7
2	Establishing relationships with international organizations for conducting joint projects	3	3.3	2.4	2.8	3.1	3.3	3.2	21.1
3	Making efforts to receive extra budget	2.8	2.8	2.5	2.7	2.9	2.8	2.9	19.4
4	Making efforts to involve university authorities with projects of the center	2.9	3.1	2.8	2.9	3	2.8	3.3	20.8
5	Using comments and critiques to enhance efficiency	3.3	2.9	3.1	2.6	2.8	2.8	3.1	20.6
6	Submitting and suggesting the center's budget to the university in a timely manner	3.3	3.1	2.8	3	3.1	3.1	3.2	21.6
7	Establishing relationships with trauma-related international organizations and institutes	3.1	3.2	2.6	3.1	3.1	3.2	3.4	21.7

1= low; 2= medium; 3= high; 4= very high

* 1= very high; 2= high; 3= medium; 4= low

** This table was completed by 16 participants

Table 6. Strength-opportunity strategies (Expansion)

#	Strategies	Feasibility	Efficiency	Costs*	Acceptance by Beneficiaries	Concordance with other plans	Compatibility with missions and objectives	Long-term Impact	Total
1	Expansion and completion of website	3.44	3	2.63	3	3.2	3.2	3.2	21.67
2	Recruiting competent researchers	2.9	3.2	2.4	3	3.2	3.1	3.4	21.2
3	Facilitating the promotion of personnel	3.1	3.2	2.63	2.94	2.9	3	3.3	21.1
4	Facilitating the participation of professors and students in research activities	2.9	2.7	2.7	2.8	2.8	2.9	3.1	19.9
5	Advocating the initiation of trauma system in Iran	2.6	3.2	1.4	2.8	2.9	3.1	3.3	19.3
6	Making efforts to receive ample budget	3.5	3.2	2.6	3.1	3.1	3.3	3.4	22.2
7	Conducting national research projects	3.3	3.1	2	2.9	2.9	3.2	3.4	20.8
8	Supporting and developing joint research projects of center's faculty with students	3.2	3	2.4	2.9	3.1	3.2	3.2	21
9	Publishing and presenting the activities of the center to others in an appropriate fashion	3.5	3.1	2.1	3	2.8	3.2	3.1	20.8

1= low; 2= medium; 3= high; 4= very high

* 1= very high; 2= high; 3= medium; 4= low

** This table was completed by 16 participants

Discussion

The final score of internal factors was 2.45 and the final score of external factors was 2.17. As both of scores are lower than the mean score (2.50), we can conclude that the current status of STSRC is threatened weakly. In other words, the current weaknesses overshadow its strengths and the threats obscure its opportunities. Under these situations, the center may make maximum use of the strengths to benefit from opportunities and reduce threats as well as correct weaknesses to enjoy the opportunities maximally and manage threats. In the present study, we proposed 36 strategies (10 weakness – threat strategies, 10 weakness – opportunity strategies, 7 strength–threat strategies, and 9 strength – opportunity strategies) to senior managers which will help them with the challenges.

In contrast to STSRC, most foreign universities which have conducted the SWOT analysis mention their scientific and educational positions as their strengths and opportunities and their funding and administrative problems as their weaknesses and threats (9-13).

A few published studies used SWOT analysis in Iran. In these studies, similar to our study, the internal and external factors are different from their counterparts in developed countries, which might be a result of the discrepancy in level of development.

Ansari *et al.* conducted SWOT analysis in the School of Management and Information at the Isfahan University of Medical Sciences and reported their internal and external factors (14).

They reported the desirable physical location of the Isfahan University of Medical Sciences as a strength (14). In comparison, the inappropriate physical location of STSRC is one of its weaknesses, similar to the study by Sedaie *et al.* in School of Rehabilitation at TUMS (15). One strength of STSRC compared to other Iranian centers is the presence of full-time prominent faculty members, which is similar to a study by Sedaie *et al.* in the School of Rehabilitation at TUMS (15). Other strengths are its independence, which has been mentioned as an opportunity in the study by Sedaie *et al.* (15), and healthy environment and the eminent personnel, similar to a study by Deputy of Research at Shahr-e-Kord University of Medical Sciences (16).

Other weaknesses include low motivation in the personnel, as in the study by Deputy of Research at Shahr-e-Kord University of Medical Sciences (16). However, in the study by Sedaie *et al.* it has been mentioned as a threat (15). Another weakness is the lack

of clear responsibilities which is similar to the study by Ansari *et al.* in the Isfahan University of Medical Sciences (14). Still another weakness is the long duration of work process, similar to the study by Deputy of Research at the Shahr-e-Kord University of Medical Sciences (16).

One of the opportunities of the center is the possibility of promotion for personnel, which is similar to the study by Sedaie *et al.* in School of Rehabilitation at TUMS (15).

One threat for STSRC was lack of participation of university authorities in the projects conducted by the center, which has also been mentioned in the study by Ansari *et al.* in the Isfahan University of Medical Sciences (14).

Limitations: Since most of the participants in our study were not familiar with the concept of SWOT analysis, the researchers were compelled to organize several meetings with them throughout the entire process of data collection in order to familiarize them with the study procedure and completing questionnaires. Furthermore, for getting free personnel's opinions, we made the necessary arrangements and provided ample reassurance for them.

In conclusion, the current status of STSRC is threatened weak and has failed to make efficient use of its internal and external factors. This center confronts many challenges; nonetheless, the weaknesses and threats may be overcome through strategic planning and taking advantage of strengths and opportunities. Considering the objectives of the present study and its outcomes, we recommend STSRC to implement the mentioned strategies.

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