Designing a Questionnaire to Measure Factors Affecting Utilization of Services for Diabetics in Health Centers Based on Social Marketing Model

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Abstract

Background: The needs and demands of patients as one of the pillars of marketing in the health field require the right tools to identify consumers' requests.

Objectives: This study was conducted to develop a tool to evaluate services utilization behavior by type 2 diabetics in health centers based on a social marketing model (ie, 7 Ps).

Methods: This study was conducted in two main stages. The first stage was performed with the aim of the initial design of the tool (ie, a questionnaire) through a literature review and professionals' opinions. The second stage was performed to confirm the validity and reliability of the prepared questionnaire in the previous stage through calculating the impact score, content validity index (CVI), content validity ratio (CVR), and Cronbach's alpha coefficient. The study participants included 8 academic and executive experts in the field of health and diabetes, 30 diabetic patients to calculate the impact score, and 50 patients with diabetes to calculate the Cronbach's alpha through test-retest. The data were analyzed using SPSS software (version 18).

Results: According to the results of the first stage of the study, a questionnaire with 46 items was designed. After determining the formal and content validity quantitatively and qualitatively, 8 items were deleted, and a questionnaire with 38 items was provided. Finally, the validity and reliability of the instrument were confirmed (CVI = 0.91; CVR = 0.92; intraclass correlation coefficient = 0.89; Cronbach's alpha = 0.92).

Conclusions: This questionnaire with confirmed validity and reliability helps analyze the diabetics' behavior and specifies the reasons for the acceptance or rejection of the services of the diabetes unit by patients. Therefore, it can be used in health centers providing services for diabetics.

Keywords: Social Marketing Model, Marketing Mix, Health Facilities, Diabetes

1. Background

Type 2 diabetes is accompanied by complications, high mortality rates, and continuous expansion of the disease. It is spreading as a result of industrialization and urbanization expansion. Therefore, it is one of the major challenges to public health (1, 2). According to the International Diabetes Federation report, about 415 million individuals suffer from diabetes around the world. It is predicted that this number will be increased to about 642.6 million in 2040 (3). Iran, with an 8% prevalence of diabetes, is among the countries that have experienced the highest prevalence rate of diabetes in the world (4).

Studies indicate that the change in lifestyle is associated with the control and prevention of chronic diseases, such as type 2 diabetes (5). Social marketing is the use of commercial marketing techniques to promote proper behaviors in audiences. In recent years, social marketing has been applied to numerous different fields, including the fight against and prevention of diseases, healthy lifestyle and health promotion, nutrition habits, obesity, drug use, smoking, alcohol consumption, road safety, speed and risk, drunk driving, and human immunodeficiency virus (6). The most important responsibility of social marketers in the health field is to ensure that what is ultimately expressed in the form of intervention can satisfy the health-related needs and desires of customers (7).

Social marketing is a vital tool for the provision of health services. The success of any program or project in this regard requires the involvement of the community or the consumer (8). The evidence suggests that service organizations that have accepted the principles of mar-

keting and have founded their plans and programs based on mixed marketing elements have reached positive results (9). The marketing mix concept is one of the core concepts in the marketing theory (10). One of the models that can be used in social marketing is the 4 Ps marketing model. The 4 Ps model includes the product, price, promotion, and place. However, according to a suggestion by Booms and Bitner (1981), in the marketing of services, using 7 Ps is more appropriate than 4 Ps. Therefore, the three Ps of personnel, process, and physical evidence should be added to the basic 4 Ps (10, 11). Despite the growing trend of paying attention to the demands and needs of patients as one of the pillars of marketing in the health sector (12), there is no proper tool to measure the use of services for diabetics in healthcare centers based on the social marketing model.

2. Objectives

This present study was conducted to develop a tool to evaluate services utilization behavior by type 2 diabetics in health centers based on a social marketing model (ie, 7 Ps).

3. Methods

This study was conducted in two stages. The first stage was performed with the aim of the initial design of the tool. Therefore, according to a review of the literature (13-17), 48 items were recognized, and an initial questionnaire was formulated in two parts. The first part of the questionnaire included the patients' demographic variables (eg, gender, education, location, and insurance status), and the second part of the questionnaire contained 46 items related to the 7 Ps model of marketing mix elements (ie, product, price, promotion, place, people [personnel], process, and physical evidence).

In the second stage, two methods were used to determine the formal validity and the content validity of the designed questionnaire. Initially, with the use of experts' comments, the items, such as observing the grammar of Persian, proper use of words, locating statements in the right place, appropriate scoring, and the time required to complete the designed tool, were considered.

Consequently, all of the items in the tool were necessarily revised and corrected. In the next step, to reduce and remove the inappropriate items and determine the importance of each of the items, the quantitative method of item impact was used (18). In this way, the researchers assigned numbers 1, 2, 3, 4, and 5 to each of the options of an item in accordance with their number and calculated the frequency of each item. Therefore, for the calculation of the impact score of the items in this study, the questionnaire was given to 30 diabetic patients. After completing the questionnaires by the target group, the following relation was used:

$$\text{Importance} \times \text{Frequency (by Percentage)} = \text{Impact Score}$$

For accepting the formal validity of each item, its impact score should not be less than 1.5. In other words, only the items with a score greater than 1.5 will be accepted in terms of formal validity (18, 19).

Quantitative content was used by both coefficients, namely the content validity ratio (CVR) and the content validity index (CVI). Lawshe devised a model to determine the content validity. According to Lawshe's model (20), at first, the questionnaire whose role is the supervision of the members of the panel group is given to the panel group to provide the possibility of an accurate judgment by the members based on the necessity of tools (ie, the model or the questionnaire). Furthermore, for the determination of the CVI in the study, eight experts (Table 1) were asked to examine each item based on a three-part range (ie, it is necessary; it is helpful, but not necessary; it is not necessary). Based on Lawshe's table, for the determination of the minimum value of the CVI, the statements with numerical values of greater than 75% (according to the opinions of eight experts) were retained. The CVI assessment was carried out based on the Waltz and Basel CVI (21). For this purpose, the researchers gave the designed questionnaire to the experts and asked them, based on the Waltz and Basel CVI, to determine the relevance, simplicity, and clarity of each of the statements in the questionnaire. Therefore, the three criteria of simplicity, relevance, and clarity were investigated by the eight experts separately based on a 4-point Likert scale for each of the items (Table 1).

Table 1. Characteristics of the Members of the Panel in Determining Content Validity

Field of Study	N	Education
Health services Management	4	PhD
Health education	2	PhD
Marketing management	2	PhD

Then, the two methods of determining internal consistency and stability were used to evaluate the reliability of the questionnaire. Cronbach's alpha was used to measure the internal consistency. Cronbach's alpha represents the appropriateness of a group of items that measures a structure weight. For a good and sufficient level of internal consistency, Cronbach's alpha should be considered within the range of 70 - 80% (22). The evaluation of stability was carried out using the test-retest method. The important point in this method is the time interval between the two tests. Burns and Grove have suggested a two-week to a one-month time interval (23). It should

be noted that the most acceptable statistical method to calculate reliability (stability) is the intraclass correlation coefficient (ICC). If the index is higher than 80%, stability is desirable (24). The reliability of the questionnaire was assessed through its completion by 50 patients with type 2 diabetes, referring to the centers. SPSS software (version 18) was used for statistical processing.

4. Results

In the section devoted to the results of determining formal validity, the most important comments of experts were proposed to make changes in some of the specialized and complex vocabularies and use a simple and understandable language for the patients to better understand some items. Concerning the analysis of the behavior of diabetic patients in using the services, four items regarding referring and following the recommendations were added to the end of the questionnaire.

At the stage of determining formal quantitative validity, items 19, 21, 22, 23, and 24 were excluded from the questionnaire based on the item impact score of less than 1.5 (Tables 2 - 4). In determining content validity quantitatively, items 3, 4, 19, 20, 21, 22, 23, and 24 were excluded from the questionnaire using the CVI. Moreover, in the section of the results of the CVR, all the items, except for items 19, 21, 22, 23, and 24, were equal to or greater than the number of Lawshe's table. This finding indicated that all the essential items have been used in this tool (Tables 2 - 4).

Table 2. Results of Impact Score, Content Validity Ratio, and Content Validity Index of Product, Price, and Place

Dimensions	Items	Impact Score	Content Validity Ratio	Content Validity Index	Results of Expert Panel
Product	1. Cares provided by physicians in the diabetes unit are very good.	5	0.75	0.87	Accept
	2. Consultations given by the nutritionist are very satisfying.	4.83	0.99	0.75	Accept
	3. More appropriate facilities and expertise in the private sector and specialized clinics are more effective in referrals.	5	0.75	0.62	Reject
	4. Providing sports and recreational facilities is effective and in compliance with medical advice.	4.72	0.75	0.62	Reject
	5. Training given by the nurses at the diabetes unit is very good.	4.72	0.99	0.87	Accept
	6. The donated blood sugar measuring device has provided an opportunity for me to measure my blood sugar on a regular basis.	5	0.75	0.79	Accept
	7. Services that I received met my needs.	5	0.99	0.99	Accept
	8. The telephone consultation which is provided is desirable.	3.91	0.99	0.99	Accept
	9. The provided specialized services are of high quality.	2.93	0.99	0.99	Accept
Price	10. Services offered to me are free.	4.72	0.99	0.99	Accept
	11. The prescribed drugs are costly.	5	0.75	0.99	Accept
	12. I cannot afford to buy the prescribed drugs.	4.83	0.99	0.99	Accept
	13. For referring to the diabetes unit, I have to pay high costs for taxis and the like.	3.91	0.99	0.99	Accept
	14. I have insurance coverage that has reduced treatment costs.	5	0.99	0.99	Accept
Place	15. The diabetes unit is close to my home.	4.72	0.99	0.99	Accept
	16. Access to the diabetes unit can be made very quickly.	3.38	0.99	0.99	Accept
	17. The services provided by the diabetes unit are offered day and night.	4.82	0.99	0.99	Accept
	18. The diabetes unit is located in the right geographic location.	3.91	0.75	0.99	Accept

Table 3. Results of Impact Score, Content Validity Ratio, and Content Validity Index of Promotion, People, and Process

Dimensions	Items	Impact Score	Content Validity Ratio	Content Validity Index	Results of Expert Panel
Promotion	19. How much is a lack of belief in self-care education to diabetics effective in complying with medical advice?	1.26	0.25	0.5	Reject
	20. Personal experience of diabetics can affect compliance with medical advice.	2.52	0.75	0.37	Reject
	21. The feasibility of medical advice (eg, lack of certain food which has been recommended) can affect compliance with medical advice.	1.062	0.5	0.62	Reject
	22. Non-scientific consultations from friends and acquaintances are effective in compliance with medical advice.	1.026	0.5	0.5	Reject
	23. How effective is the use of other herbal and therapeutic methods in compliance with medical advice?	1.22	0.5	0.25	Reject
	24. Lack of knowledge about, and belief in, the disease affects the referrals of diabetic patients to the diabetes unit.	1.2	0.25	0.37	Reject
	25. The diabetes unit uses broad advertising to inform me.	4.39	0.99	0.99	Accept
	26. Notification is conducted well by the diabetes unit in the city.	3.91	0.99	0.99	Accept
	27. The diabetes unit publishes regular periodicals, such as manuals and brochures, to inform others.	4.52	0.75	0.99	Accept
	28. The diabetes unit holds various ceremonies and festivals associated with the disease.	4.59	0.99	0.99	Accept
People (personnel)	29. The nutritionist at the diabetes unit is professional and skilled.	3.74	0.75	0.99	Accept
	30. People providing services in the diabetes unit have been trained well.	4.3	0.75	0.99	Accept
	31. The diabetes unit's personnel have good communication skills.	3.71	0.99	0.99	Accept
	32. The diabetes unit's personnel have treated me in a good manner.	4.22	0.75	0.87	Accept
Process	33. Receiving services is well done in all stages.	4.08	0.75	0.87	Accept
	34. There are few delays in providing services.	4.1	0.99	0.99	Accept
	35. Receiving services in the diabetes unit does not take much time from me.	3.69	0.99	0.79	Accept
	36. Scheduling in the diabetes unit is appropriate.	3.66	0.75	0.99	Accept

Table 4. Results of Impact Score, Content Validity Ratio, and Content Validity Index of Physical Evidence, Regular Attendance, and Following Medical Advice

Dimensions	Items	Impact Score	Content Validity Ratio	Content Validity Index	Results of Expert Panel
Physical evidence	37. There are enough amenities (eg, bathroom dispensers and suitable chairs) in the diabetes unit.	4.39	0.99	0.99	Accept
	38. There are laboratory facilities in the diabetes unit.	3.38	0.99	0.87	Accept
	39. There is specialized equipment in the diabetes unit to provide services.	3.91	0.99	0.99	Accept
	40. The diabetes unit is spacious, and the building has a good view.	3.74	0.99	0.99	Accept
	41. The interior of the diabetes unit is very orderly and neat.	4.82	0.75	0.99	Accept
	42. In the diabetes unit, cleanliness is fully respected.	2.52	0.99	0.99	Accept
Regular attendance	43. I frequently attend the diabetes unit.	5	0.99	0.99	Accept
	44. I attend the diabetes unit on appointments.	3.38	0.99	0.87	Accept
Following medical advice	45. I follow the medical advice offered to me in the diabetes unit.	4.52	0.99	0.99	Accept
	46. I do believe that if I do not comply with medical advice, my disease will deteriorate.	4.04	0.99	0.99	Accept

The internal reliability of the questionnaire was 0.927 using Cronbach's alpha coefficient, which indicates that the questionnaire has a strong internal consistency. It should be noted that at this stage, no items were eliminated. In addition, for the determination of the reliability of the questionnaire, the test-retest method was used within 10 days, and the scores obtained at this stage were compared using the ICC. If this index is higher than 80%, the level of stability would be desirable. At this stage, all the items which received scores more than 80% were confirmed (Table 5).

Table 5. Results of Internal and External Consistency Measurements of the Tool

Dimensions	Intraclass Correlation Coefficient	Cronbach's Alpha	Number of Items	Sig
Product	0.825	0.89	7	0.50
Price	0.910	0.93	5	0.50
Place	0.808	0.89	4	0.50
Promotion	0.939	0.94	4	0.50
Process	0.905	0.91	4	0.50
People (Personnel)	0.931	0.94	4	0.50
Physical evidence	0.809	0.87	6	0.50
Regular attendance	0.994	0.99	2	0.50
Following medical advice	0.977	0.98	2	0.50
Total tools	0.899	0.927	38	0.50

5. Discussion

In marketing healthcare, customer satisfaction is emphasized more than anything else (25), and the study of consumer behavior plays an important role in marketing. Since this type of marketing requires the right understanding of the consumer's needs and demands (26), it would also be acceptable to the health sector (12). This study was based on social marketing variables and, according to the services available in the units providing

diabetes services exclusively to patients with type 2, was conducted to design a valid and reliable tool for analyzing the behavior of the use of services offered to patients in diabetes units. This study has been among the first studies with regard to designing a valid and reliable tool in analyzing the behavior of diabetic patients referring to health centers.

For the improvement of the validity of the questionnaire, we used the experts' comments in various disciplines, such as business administration, education, health, nutrition science, and health services management, along with one of the most reliable methods of content validity (ie, calculating the CVI and CVR). The results showed the good validity of the questionnaire. Moreover, the reliability of the questionnaire was confirmed using Cronbach's alpha and test-retest.

The results of the present study confirmed the 7-item service (product) mix. In connection with the necessity of paying attention to this dimension, Weingart et al., in their study, indicated that the reduced quality of services is highly associated with the inpatients' dissatisfaction (27). On the other hand, Keller et al. believe that most of the service industries, such as health care, are facing increased competition. Therefore, it is especially important to deal with the services as products offered to patients in the marketing field (28).

Another dimension that was confirmed in this study was the 5-item price mix. Souba et al., in their study entitled "Marketing Strategy: An Essential Component of Business Development for Academic Health Centers", have emphasized the application of flexible pricing strategies for services as an important factor in marketing in health care centers (29). In another study, in addition to emphasizing the strategy of having flexible prices, Lee and Shih believe that for the customers to buy a product or receive a service, the price of the received product or service should be less than its benefits (30).

The dimension of place or access to hospital services that was confirmed in the present study as an important factor in the selection of patients with 4 items was similarly identified as one of the main aspects of the quality perceived by the patients in a study conducted by Rao et al. (31). In addition, in another study carried out by Shook on obstacles to transportation and its role in accessing health services, two-thirds of the subjects said that they experienced transportation barriers. Moreover, 40% of the subjects stated that due to transportation barriers, they were unable to have access to health centers (32).

The dimension of promotion, with the greatest number of deleted items, was finally approved by 4 items. According to Berkowitz, no part of the marketing mix is as much visible as promotion is in health promotion (25). According to several studies, no single tool can satisfy the objectives of promotion. Therefore, most service organizations should use more than a means to promote their services (15).

Another finding of this study was to verify the dimen-

sion of physical evidence with 6-item amenities, including laboratories, specialized equipment, enough space and building facades, order, symmetry, and a clean environment. Shirzadi et al. value the view of the wards and inner / physical space, design, and interior decoration of health care centers providing services. Shirzadi et al. also believe that paying attention to the impressive appearance of a hospital and its outer space and facilities is among the variables affecting the mix. Previous studies showed that one of the elements in hospital competition is hoteling services, which could affect customer satisfaction and loyalty (33). Souba et al. believe that just similar to fear, anxiety, and uncertainty, which are associated with the diagnosis of numerous diseases, the environment around the patient who is under the care is especially important (29). The patient's physical environment can have a favorable effect on the mood of patients and make them feel well. Lee and Shih, in their study, state that it is not unusual that clients abstain from referring to a hospital with a bad environment or sub-standard non-skilled physicians (30).

In the present study, the personnel was considered the sixth P. Furthermore, the specialized and training skills, communication skills, and behavior of the personnel were investigated through 4 items. Undoubtedly, human resources, as one of the main sources of an organization, play an important role in achieving the organization's objectives. The quality of effectiveness, effectiveness, efficiency, access, and reliability of health services depend on the performance of the staff offering these services. In contrast, the performance of the service providers is determined by policies, which guarantee the supply of an adequate workforce with the right skills. Human resources should be used at the right time and place with reasonable costs (34). Dussault claims one of the weaknesses in the health sector in developing countries is related to the workforce, which is in dire need of strategic planning (34). Other findings of the research confirmed the work process mix in terms of the working process, waiting queue, and appointment. The process is one of the crucial elements of the mixed components of extensive marketing in services and should be considered an important strategic component. This is because the process might affect the initial decision of the client to purchase a service and the level of customer satisfaction (35).

5.1. Conclusions

Since this tool has been designed to measure the use of services provided at diabetes units in Ahvaz, Iran, it helps the researchers analyze the diabetic patients' behavior and specifies the reasons for the acceptance or rejection of the services of the diabetes unit by patients. It can also be used in all centers providing care services for diabetic patients. A limitation of this study was its failure in considering the diabetic patients' views in rural areas and the patients referring to diabetic centers in

the cities with more facilities than Ahvaz. Therefore, if a study is conducted using these groups, a more comprehensive tool can be provided for analyzing the behavior of clients referring to these centers. In addition, this tool can be modified and used to analyze the behavior of the rejection of health services among other cardiovascular patients and pregnant women. Health sector managers utilizing the results of this tool can take the necessary measures to expand the access to and the benefits from the services.

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