

# The requirements of developing programs for the management of non-communicable diseases in Iran based on the CIPP model: a qualitative study

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## Abstract

**Purpose** – One of the priorities of the health system is community health promotion. In this regards, proper development of programs and plans is needed to create a responsive system which leads to health promotion. The aim of this study was to identify the requirements for developing non-communicable disease (NCDs) programs based on CIPP (context, input, process and product) model.

**Design/methodology/approach** – This is a qualitative study. Data were collected through semi-structured interviews with 40 experienced informants in the field of NCDs. The interviewees were selected bases on pre-determined criteria which then were completed by snowball sampling. Analysis was carried out using a content analysis approach that led to identifying program development requirements in four dimensions of context, input, process and product.

**Findings** – Twenty-nine requirements of developing program were categorized in four domains of context, input, process and product. These requirements comprised of pilot studies, the existence of appropriate needs assessment, evidence-based programs, promoting organizational culture, adequacy of resources, identification of stakeholders and comprehensive cooperation and existence of an appropriate evaluation system.

**Research limitations/implications** – Since this study was performed through a qualitative method, it is possible, some prerequisites of program development may not be encountered. But the extreme effort has been made to perceive diversity and different aspects.

**Originality/value** – The first study was in the field of appropriate requirements for program development in the context of a centralized health system in a developing country.

**Keywords** Program development, Integrated management, Prevention, Control, Non-communicable diseases  
**Paper type** Research paper



## Introduction

Non communicable diseases (NCDs), principally cardiovascular diseases, cancer, diabetes and chronic respiratory diseases, are the leading causes of death. NCDs could be prevented through reduction of main risk factors, namely tobacco use, harmful use of alcohol, unhealthy diet and physical inactivity. Premature deaths from NCDs are diminished through well-timed diagnosis of diseases, treatment and care [1]. Non-communicable diseases are one of the greatest health problems in Iran. In 2016, there were 226,000 due to NCDs and the death rate increased to 14.5% over the past two decades [1]. In Iran, dietary risk factors are the leading ones and metabolic risk factors stand on the second position. Tobacco use, air pollution, low physical activity, alcohol and drug misuse come next, respectively [2].

Prevalence of NCDs and their effects on society have made them a priority for any health system. Well-functioning health systems with optimal use of available resources provide optimal health for their community. Efficient and effective management of health services in the field of NCDs could be achieved through well-developed programs that take into account technological advances, growing customer expectations, increasing demand, scarcity of resources, increased competition, concerns about safety, failures and errors of health care systems and accurate evaluation [3].

Programs would not succeed and achieve goals unless a suitable development structure is considered and executive tasks such as organization, recruitment, leadership and coordination are taken into account. Developing a plan involves taking steps to achieve desired circumstances, avoid wrongdoing, reduce number of mistakes and take opportunities [4]. Prior to developing programs, planners and policymakers should take appropriate action to address inequalities in the health sector regarding various indicators besides accessibility of facilities and services in different regions of a country [5].

Evaluation systems are warranted to understand the potentiality of achievement, especially in complex and dynamic circumstances. Program evaluation can help us to see how intervention leads to system success. Moreover, it provides insight into program modifications to gain enhanced efficiency [6].

Success rate of health systems requires a regular and careful evaluation framework for developing national documents. Developing strategic and operational plans in the field of NCDs necessitates constant monitoring within a specified framework for over ten years. Measurement steps for evaluation and performance are also warranted. Comparing actual conditions with the desired outcomes aids managers and policymakers achieve goals and objectives [7].

Different evaluation models are available for national documents. Various indicators and criteria such as governance, access, health care costs, financing, justice and quality of health care are defined in the assessment patterns and frameworks of health systems in different countries. Varied evaluation approaches can be used in health systems including time-cost models (such as half-life chart - score model), models of organizational excellence and self-evaluation (such as Deming model, quality audit model, Malcolm Baldrige quality model, organization excellence model) and integrated models such as smart system, performance charter model, modeling model, management by objective, Hoshin management system model, balanced scorecard and Donabedian framework) [8].

The following models along with the CIPP (context, input, process and product) model are helpful for contexts similar to this study. Approaches, such as the integrated performance model, for the healthcare system that attempts to create an integrated global performance model emphasizes external and internal factors such as economic, social and organizational determinants of the health system, goals and functions of the health system [9]. The model of the World Health Organization (WHO) is a framework in which the three main goals of improving health, accountability and fairness in financial participation are identified as intrinsic goals and four basic functions including funding, service delivery, resource

production and stewardship as tool goal [10]. Systems Thinking Framework seeks to identify important interrelationships and repetitive events. This framework defines four levers for policymakers including organizational arrangements, the allocation of resources and payment systems to providers and providing services. In this framework four intermediate goals are defined including justice, efficiency (technical and allocative), effectiveness and right to choose. Three final goals are also presented comprising health promotion, protection of financial risk and customer satisfaction [11].

Among these, the CIPP model is a comprehensive, functional model that considers all aspects of the program or system. It is a decision-making model which is more comprehensive than other ones. CIPP stands for context (C), input (I), process (P) and product (P) [12].

Appropriately-developed programs are one of the most important indicators of success and purposefulness for any health system. Such programs result from proper evaluation of alignment of activities, organizational values, analysis of inputs, processes and the outcomes. The main purpose of developing programs in the non-communicable field is to improve the process of prevention, control and management of diseases. The WHO has made many recommendations for the development of such programs. A few prerequisites, which are not necessarily the same in all countries, must be identified. In 2006, a new department was established in the Ministry of Health under the auspices of the Deputy Minister of Health to control NCDs. Iran's national health care system assigned monitoring and caring for NCDs as a regular activity [13]. Achievements of the Iranian health system in the prevention and control of NCDs with care programs for diabetes, hypertension, neonatal hypothyroidism, oral health and thalassemia have been integrated into the rural health network. Moreover, non-communicable risk factor surveys (using STEPS model of the WHO) have been conducted continuously since 2004. Studies were also carried out on disease burden [14].

Using appropriate frameworks enhances the effectiveness of plans and policies as they identify the causes and factors that affect the cultural, social, economic, political, organizational, historical and legal aspects [14]. Recognizing the requirements and principles of developing appropriate programs, which address issues related to NCDs, is a fundamental and critical process. In this sense, this study aimed to determine the requirements of developing programs in the field of NCDs based on the CIPP model.

## Methods

### *Sampling and selection of study participants*

This study was conducted in five universities of medical sciences and the Ministry of Health of Iran in the fields related to the prevention and control of NCDs during a period of three months from December 2019 to March 2020. To our best knowledge, no study has been conducted concerning the prerequisites of developing a program in the field of NCDs in Iran. The present study enjoyed a qualitative approach. The data were analyzed based on the CIPP model with directed content analysis. The participants were selected through purposive sampling. The criteria for their selection was their extensive experience in different fields of NCDs including research, service provision and management at different national and provincial levels as well as their motivation to take part in the study. The inclusion criteria also considered individual features such as a five-year work experience, knowledge and specialization in the field of program development, prevention and control of NCDs. In this way, the best and most knowledgeable experts participated in the study with informed consent. In this regard, one of the specialists in the field of NCDs was interviewed. The next participant was then introduced and interviewed.

Semi-structured face-to-face interviews were conducted for data collection. An interview protocol was designed based on the literature review. After two initial in-depth interviews,

the protocol was developed fully. The participants were invited to be interviewed through emails or phone calls. They were informed about the time and place of the interviews in advance so they could choose the most appropriate time and place. The interviewees signed a written consent both for their participation in the study and voice recording prior to interviews. They were able to leave the interviews at any time if they felt displeased. Interviews were conducted by one of the researchers. At the beginning of each interview, a summary of the research intention was presented and, after each interview and to lead the research process properly, modifications were made in the protocol for the following interview.

#### *Data management and analysis*

The interviews were conducted over a period of three months, from December 2019 to March 2020. Each interview session lasted 60–80 minutes. The content of the interviews was transcribed precisely right after each interview and was used as a guide for the following stages of the study. After the fortieth interview, the data were saturated. Directed content analysis was used for data analysis. The transcripts were analyzed manually. The initial framework was based on the CIPP model which includes four dimensions of context, input, process and product. The CIPP model was fixed but the subgroups were changed several times. Four criteria of acceptability, portability, reliability and verifiability were used to ensure the validity, accuracy and reliability of the qualitative data [12]. To increase the reliability of the data, sampling was performed in different universities of medical sciences and measures such as taking notes and recording the voices were considered during the process of research. In addition, codes derived from the interviews were presented to the participants. Once their desired modifications were made, the codes were approved. In order to guarantee the validity of the data, the results were provided to two management academics. Moreover, to ensure the agreement in opinions, the research findings were verified and their expansion was ensured through a rich description and review of data by the research supervisors (second and third authors). In this sense, the findings of the study were confirmed. Given that the three criteria for reliability and validity of qualitative research were observed fully, it could be concluded that this study benefited from these measures as well.

In order to check the validity and reliability of the data, after the initial coding, the participants and research assistants reviewed the codes. Researchers discussed the differences and similarities in the codes. The categories were also compared until an agreement was made. The categories were reexamined for supporting or rejecting data, and several sessions of discussion and comparison with the research team were held. Sufficient time was allocated to data collection, interviewing and observing participants. Constant engagement with the participants was considered to increase the credibility [15].

#### *Ethical considerations*

The present study was approved by the ethical committee of Kerman University of Medical Sciences (IR.KMU.REC.1399.272).

## **Results**

Forty informants participated in this study; demographic characteristics are presented in [Table 1](#). Using content analysis, requirements for development of non-communicable programs are categorized in four main themes including context, input, process and product. We identified 12 sub-themes for the context dimension, 5 for input dimension, 8 for process dimension and 4 in product dimension ([Table 2](#)).

**Table 1.**  
Biographical  
characteristics of the  
interviewee's  
participants

| Descriptive statistics participants  |             | Frequency (%) | Descriptive statistics participants |                      | Frequency (%)                    |
|--|-------------|---------------|-------------------------------------|----------------------|----------------------------------|
| Gender   | Female      | 10 (25)       | Education                           | B. Sc                | 7 (17.5)                         |
|  |             |               |                                     | MSc                  | 2 (5)                            |
|  |             |               |                                     | PhD                  | 10 (25)                          |
|  |             |               |                                     | General practitioner | 16 (40)                          |
|  |             |               |                                     | Specialist doctor    | 3 (7.5)                          |
|  | Male        | 30 (75)       | Above specialization                | 2 (5)                |                                  |
| Department/<br>Faculty   | Faculty     | 13 (32.5)     | Work experience                     | 17.5 average years   |                                  |
|  | Non-faculty | 27 (67.5)     |                                     | Age                  | 49.5 average age of participants |
| <i>Qualifications of study participants</i>  |             |               |                                     |                      |                                  |
| Membership and participation in scientific associations related to NCDs                      |             |               |                                     |                      | 16 (40)                          |
| Guidance and advice of several dissertations in the field of NCDs                            |             |               |                                     |                      | 15 (37.5)                        |
| Participated in the internal and external assembly of papers of NCDs in the last three years |             |               |                                     |                      | 11 (27.5)                        |
| Use of study opportunities in the field of NCDs  |             |               |                                     |                      | 2 (5)                            |
| Compiled or translated in the field of NCDs  |             |               |                                     |                      | 18 (45)                          |
| Teaching what lessons about the management, prevention and control of NCDs                   |             |               |                                     |                      | 14 (35)                          |
| Scientific article in prestigious journals in the field of NCDs during the last three years  |             |               |                                     |                      | 20 (50)                          |
| Initiatives in the field of NCDs management  |             |               |                                     |                      | 11 (27.5)                        |

*Context dimension*

Requirements associated with the dimension of context encompass issues such as conducting pilot studies, performing needs assessment, promoting organizational culture, considering ethics and confidentiality, presenting an overview and addressing NCCDs in the forms of prevention, treatment, eradication and control, building trust in the health system, creating common concepts, developing policies and rules, providing protocols and instructions, developing appropriate program, setting goals and indicators, considering rational supremacy in program development and evaluation, service prioritization and epidemiological study of the disease.

Pilot studies are one of the prerequisites for developing a program in this regard, a participant stated that “... If programs are conducted as a pilot, we would face fewer problems in the programs and problems are overcome in the pilot phase ...” (Twentieth participant).

Promoting organizational culture is another requirement for program development. One of the informants believed “... In the field of NCDs, culture is an important issue and culture building happens when service providers take action in this regard, move toward beliefs and attitudes that improve health ...” (Tenth participant).

Scrutinizing epidemiological conditions was identified as a further requirement of program development. In this regard an interviewee said: “... In order to control NCDs, epidemiological conditions have to be examined and a set of indicators should be available ...” (Fifth participant).

*Input dimensions*

We figured out some other requirements which are related to input dimension, namely, considering the proportionality of the number of personnel with the number and volume of

**Table 2.**  
Background  
dimensions of the CIPP  
model in the  
requirements for non-  
communicable domain  
program development

| Category | Sub-categories   |
|----------|--|
| Context  | Necessity of pilot studies<br>Needs assessment<br>Evidence-based programs<br>Promoting organizational culture<br>Consider ethics and confidentiality<br>Comprehensive and holistic view with consideration the four forms: prevention, treatment, eradication and control<br>Building trust in the health system<br>Creating common concepts<br>Existence of policies, rules, protocols and instructions, programs, goals and indicators appropriate<br>Rational governance in program development, implementation and evaluation<br>Service prioritization<br>Epidemiological study |
| Input    | Sufficient number of staff according to the number and volume of services<br>Appropriateness of physical structure and equipment<br>Creating organizational and social structural networks<br>Appropriate budget allocation<br>Appropriate payment system  |
| Process  | Stakeholder identification and involvement<br>Comprehensive medical education system<br>Appropriate decision-making system<br>Adjusting educational curriculum with the field of NCDs<br>Providing services permanently and actively<br>Relationship between service delivery levels<br>Documentation at service delivery levels<br>Paying attention to staff motivation   |
| Product  | Existence of appropriate evaluation system<br>Continuity in evaluation<br>Updating evaluation process<br>Appropriate evaluation indicators   |

services, appropriateness of the physical structure and equipment, creating organizational and social structural networks, allocating appropriate budget and suitable payment.

One of the items in the input dimension is the proportionality of the number of staff with the number and volume of services. One of the participants thought "... As the number of programs increases, the workload of staff endangers the quality of provided services. Due to the increased health care visits, face-to-face contact is reduced and only the forms are filled out ...". (Second participant).

Appropriate budget allocation is another prerequisite for program development. A participant stated that "... One of the significant factors that must be cautiously considered in the process of program development is appropriate budget allocation. If there is no budget, the motivation and potential of the organization will be wasted ...". (Twenty-second participant).

Payment plays an important role in program development. In this study, it was claimed by a participant that "... Reduction of payments leads to lower job security and decreases motivation ...". (second participant).

### *Process dimension*

Dimension of process was the third necessity of program development. Identification of stakeholders and comprehensive cooperation, comprehensive education in the field of prevention, treatment and follow-up, admission, obtaining information, appropriate decision-

making system, updating educational curriculum in the field of NCDs, providing services permanently and actively, relationship between service delivery levels, documentation at service delivery levels and paying attention to staff motivation were among the topics that include the process dimension.

Identifying stakeholders and comprehensive cooperation in developing programs is an enabling factor, about which a participant said "... Inter and intra-sectoral cooperation should be considered through external and internal cooperation to solve problems in the prevention and treatment of diseases ..." (seventh participant).

Comprehensive education in the field of prevention, treatment and follow-up is one of the requirements of the programs as stated by an informant "... Inadequate and ineffective education in the field of prevention, treatment and rehabilitation ... we should shift from individual patient centered medical education to community centered education ..." (Twenty-fourth participant).

Another requirement in the dimension of the process was documentation at service delivery level, about which a participant stated "... The process of documenting program development is not performed properly at different levels of service delivery ..." (First participant).

#### *Product dimension*

Last but by no means was least the product dimension. Items such as existence of an appropriate evaluation system, constant evaluation, updating the evaluation process and appropriate evaluation indicators were considered in this dimension.

Having a proper evaluation system in the programs is absolutely critical. In this study, it was stated that "... Programs ought to be evaluated in order to review the results, thus comprehensive and appropriate evaluation systems are a must for every health system ..." (First participant).

Appropriate evaluation indicators should be considered in the program, as a participant stated "... Appropriate indices for program evaluation should be considered. Indicators can be monitored, measured and observed ..." (Nineteenth participant).

Prior to the development of programs, the need for updating the evaluation process must be considered. One of the participants in this study stated that "... In the development of the program, technical and specialized committees are warranted as standardization takes place through these committees ..." (Sixteenth participant).

#### *Discussion*

The main purpose of this study was to identify the requirements of developing NCD programs based on the CIPP model. Based on the CIPP model, program development requirements are discussed in four dimensions of context, input, process and product.

One of the requirements for program development is scrutinizing epidemiological situation and the status of mortality, prevalence and incidence. Similarly, Naghavi in 2006 cited that specifying the most appropriate solutions or cost-effective methods would not take place without the recognition of national and regional problems along with priorities based on the identification of demographic and epidemiological features [6].

Prioritization is one of the most important issues in program development, through which the focus is directed toward proper goals, fewer resources will be wasted and access to services will be more equitable. A similar study by Robinson *et al.* [16] suggested that due to the growing demand and economic conditions, efforts are being made to prioritize evidence-based goals and resources. In this sense, national and local facilities should be used. The same study reported that making right decisions about resource allocation would be guaranteed by increasing the acceptability of prioritized processes for the officials who are involved in decision-making and implementing the choices.

One of the requirements of program development is grounding the program on evidence which is available through apparent and systematic processes. Brownson *et al.* [17] believed that health systems should move towards evidence-based decisions due to limited resources, existing structures and community access. If health system decisions are based on evidence, the gap between program development and its implementation will be greatly reduced. Therefore, by building capacity in the health systems, technical assistance, evaluation and feedback, communication and motivation in organizations could be increased.

In the input dimension, one of the requirements is proportionality of the number of staff with the number and volume of services. Dieleman *et al.* [18] expressed that the insufficient performance of health systems might be due to lack of adequate human resources. They also claimed that insufficient number and quality of personnel leads to inability to satisfy the community needs.

In the process dimension, documentation at service delivery level was identified as one of important prerequisites of program development. Documentation increases accountability against important components of care including provision, maintenance and promotion of individuals and community health. Gissler *et al.* [19] stated that governments are trying to solve the problems of health information services through National Health Information Systems (NHIS) which often include several subsystems. The challenges associated with information system and health system documentation lead to gaps or overlaps in information along with difficulties in coordinating and controlling the information. Lack of sufficient documentation to determine the current situation and lack of knowledge of the results of previous studies are other challenges for information systems.

Identifying stakeholders and their comprehensive cooperation could be considered a requirement for program development. The ultimate intention is the participation of internal and external stakeholders in an attempt to improve the service. Auvinen [20] believes effective health care in the workplace requires collaboration, partnership and alliance with internal, liaison and external stakeholders. The basic steps for full cooperation with different stakeholders are identifying the main stakeholders, regularly analyzing their views and positions, and developing stakeholders' participation. Stakeholder analysis begins with the goal of evaluating and understanding stakeholders from an organization's perspective by identifying and classifying key stakeholders. The issue of stakeholders in the field of national health care systems and health care organizations is a principle one since health systems alone are not able to meet all the needs of the society.

In the product dimension of CIPP model, the element of continuous evaluation was mentioned as one of the requirements for program development. In this regard, Gharaei [21] pointed out that evaluation should be performed at regular intervals. To overcome the limitation of non-generalizability of the results in qualitative studies, we tried to select the participants with extensive executive experiences so we could expand the results to similar contexts. Furthermore, some study participants expressed their opinions based on their personal working fields which might have resulted in a kind of tunnel view. To overcome this issue, participants were selected from various expert groups.

### Conclusion

To sum up, we should pay attention to indicators and preconditions identified in this study to develop programs for NCDs. In previous studies, the prerequisites for program development were not considered in a comprehensive manner. A proposed set of prerequisites encompasses the fundamental and influential aspects of the context, input, process and product of any program. Future studies should provide a model to assess the capacity of health systems to develop and implement programs in the field of NCDs.

Conflict of Interest: None



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Requirements  
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