

# Developing the Job Description for Diabetes Nurse Specialists: A Modified Delphi Approach

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## Abstract

**Background:** The first step to establish a new academic major is the need assessment and extraction of professional and specialized tasks.

**Objectives:** The current study aimed to identify and describe the duties of diabetes nurse specialists.

**Methods:** This needs assessment study was performed using modified Delphi technique in Isfahan in 2014 - 2015. The study population consisted of patients with diabetes and their families, nurses, endocrinologists, diabetologists and nursing faculty members. The study was conducted in three rounds: first, through qualitative interviews and focus group discussions, the duties and tasks of diabetes nurse specialists were extracted, then a questionnaire was designed and in two consecutive rounds, the experts expressed their opinions about the tasks.

**Results:** The first round of modified Delphi technique resulted in 500 initial codes. According to these codes, 164 duties were classified into seven categories. In the second round of Delphi approach, the experts reached to 100% consensus in 126 tasks. According to the participants, 74 of the 126 duties were similar, overlapping and inappropriate, and thus were eliminated. In the last round of the study according to the opinions of the experts, 15 more tasks were added to the previous list. Finally, job description for diabetes nurse specialist was developed in six tasks on professional responsibilities, 17 tasks on the area of education, 25 tasks regarding caring and treatment, 6 tasks on society and 13 tasks on management.

**Conclusions:** This study led to identification and classification of diabetes nurse specialist duties. The findings can help nursing faculties and other institutes to develop task based educational programs for nurses in diabetes management.

**Keywords:** Delphi Technique, Nurse Specialist, Diabetes Mellitus, Professional Role, Iran

## 1. Background

Patients with chronic diseases, such as diabetes, have various needs. To address these needs, a group of different professionals in health services with diverse expertise should work together (1). Diabetes management team usually consists of general practitioner, diabetologist, diabetes educator, nurse, podiatrist, nutritionist, ophthalmologist and dentist. The patients and their families are also members of the team (2). Numerous clinical trials have shown the effectiveness of nurses in diabetes management (3-5). Nurses can have an active role in coordination of care, patient education, counseling and close monitoring of the patients' health outcomes (3, 5, 6). Overall, the team work in the healthcare system is cost effective and can increase the patient's satisfaction and improve the quality of care (7). Nurses should have specialized knowledge and skills to sufficiently manage diabetes (8). In many countries, including Sweden, Australia, Great Britain, America and even some Asian countries, including

Japan, nurses should hold MSc or PhD to have a management role in diabetes care. The history of diabetes nursing in the United States (US) dates back to 20 years ago. It also has a long history in many other countries such as Netherlands, Great Britain, Finland, Ireland, Sweden and Japan (9-15). In these countries, diabetes specialist nurses play effective roles in diabetes management and perform tasks such as promoting healthy lifestyles, supporting patient in self-management of diabetes, training patients and their family, telephone counseling and doing research and coordinating clinical interventions (11, 15). In Iran, the national program for the prevention and control of type 2 diabetes was initiated in response to the call for action from the Eastern-Mediterranean world health organization (WHO) to prevent and control diabetes in 2003. In addition, the role of nurses was introduced as one of the main anchors of the diabetes care team in the third and fourth levels of the program (16, 17). Nevertheless, this role is not executed, or implemented by non-nurses, untrained nurses,

or nurses with inadequate training (17). Evidence shows that patients with diabetes referring to the diabetes units covered by the Iran's national plan for prevention and control of diabetes do not receive sufficient education (18, 19). Such evidence clearly shows the importance of planning to train specialized nurses to prepare them for performing specialized roles in diabetes management. The author, with the cooperation of Sedigheh Tahereh endocrine and metabolism research center affiliated to Isfahan University of Medical Sciences, Isfahan, Iran, conducted the first specialized course of diabetes nurse accredited by the department of continuing education of Iran's ministry of health and medical education in 2008 for nurses working in diabetes centers and clinics. In addition, five short two-week training courses were held for nurses in diabetes centers covered by the health department of Isfahan province in 2009 - 2010 (17). Afterwards, efforts were made to establish a MSc degree course in diabetes nursing. The first step to establish a new academic major is needs assessment and extraction of the professional and specialized duties of the learners. Conducting a needs assessment before any program increases the effectiveness and efficiency of that program (20). Results may also provide important information to organizations offering international training courses for diabetes nurses, including the international diabetes federation for further compliance of curriculums with context-based requirements of students with different nationalities.

## 2. Objectives

The present study is part of a larger study aimed to identify and describe the roles and duties of a postgraduate diabetes nurse.

## 3. Methods

This needs assessment study was conducted using the modified Delphi technique (21) from June 2014 to August 2015 in Isfahan, Iran. In this study, three rounds of Delphi were conducted to identify the roles and duties of a postgraduate diabetes nurse.

### 3.1. First Round

A qualitative content analysis (22) and an extensive literature review were conducted in the first round of the modified Delphi technique (21, 22). In the qualitative phase of the study, a purposive sampling technique was used. The study participants consisted of patients with type 1 and 2 diabetes who referred to the Sedigheh Tahereh endocrine and metabolism research center and their family

members, nurses working in education departments of diabetes clinics, diabetologists and endocrinologists. The inclusion criteria were at least one year record of diabetes for patients, and at least one year of experience of working in diabetes centers and clinics for the physicians and nurses and willingness to participate in the study for all the participants. Data were collected using three focus group discussions with patients with diabetes type 1 and 2, and 27 individual semi-structured interviews with ten family members of patients, four endocrinologists, seven diabetologists and six nurses. Before the group interviews, all individuals were contacted via telephone and the purpose of the interview was explained to them. If they agreed to participate in the interview, the time and the place of the interview were coordinated with them. A total of 25 individuals participated in three group interviews in two sessions including six and nine patients with diabetes type 1 and one session including ten patients with diabetes type 2. With the agreement of patients and their families, the endocrine and metabolism research center was selected as the environment for group interviews with patients and individual interviews with their family members. Interviews with the endocrinologist, diabetologists and nurses were conducted in their workplace. In the interview sessions, the key questions included What are your expectations from a postgraduate diabetes nurse specialist? and Please describe your point of view on the duties of the postgraduate diabetes nurse specialist. With the permission of the participants, interviews were recorded in MP4 format. The durations of the individual and focus group interviews were 25 and 80 minutes, respectively. All interviews were transcribed. Subsequent interviews were conducted and transcribed based on continuous data comparison until achieving data saturation. Then, an extensive review was conducted on reliable sources. The data collected from the interviews and the literature review were merged and analyzed using conventional qualitative content analysis.

### 3.2. Second Round

The second round of the modified Delphi technique was performed by distributing a structured questionnaire (using post or email) based on the results of the previous round, and obtaining each participant's feedback. By the consensus level technique, the percentage of their agreement on the mentioned items was acquired (21). In the second round, a researcher made questionnaire was designed with a brief introduction of the study and demographic data of the participants including age, gender, work experience and level of education. The questionnaire included seven categories, eleven subcategories, and 164 tasks obtained in the previous round. Each task had a five-part column and the participants were asked to specify the impor-

tance of each task through grading. The grading of each of the tasks was based on a 5-point Likert scale including very high (5 points), high (4 points), middle (3 points), low (2 points) and very low (1 points). The content and face validity of the questionnaire were confirmed through using the nursing faculty members' opinions and applying their ideas. This questionnaire was sent to purposively selected experts present in the first round of the study, including four diabetologists and six nurses. The questionnaire was also sent to twelve nursing professors across the country holding MSc and PhD experienced in teaching diabetes to nursing students and training patients with diabetes, and one of the officials of the department of endocrinology at the Ministry of Health and Medical Education. First, all the individuals were contacted by telephone and the study aim was explained to them. After obtaining the subjects' informed consents for participation in the study, their e-mail addresses were received and questionnaires were sent. A ten-day response deadline was considered for the questionnaires of the second phase of the Delphi technique. The individuals who had not returned the questionnaires were contacted again and a one-week deadline was given until all the questionnaires were completed and returned. In data analysis, the consensus level was considered 70% (22).

### 3.3. Third Round

The third round of the modified Delphi approach included the distribution of a structured questionnaire based on the results of the second round to verify or correct each participant's previous comments to achieve the highest level of consensus among the members (21). In this round, based on consensus among participants in the second round of the Delphi approach, some job descriptions were merged and some duties were excluded due to common nature and being repetitive in the view of the specialists. The duties that had earned 100% consensus in the second round of Delphi were extracted from the questionnaire. Finally, to investigate the possibility of achieving higher than 70% consensus among the participants on the remaining codes, the questionnaire of the third stage of Delphi was prepared. This questionnaire also contained a description of the study and how to fill out the questionnaire. The questionnaire included the remaining five categories, seven subcategories, and eighteen tasks on which consensus had not been reached yet. There were three columns in front of each task. The first column contained the previous score given by the participant to the related item. The second column contained the median score of the other participants. The third column was empty so that the participants could again score the questioned item. The respondent could re-enter his previous score or

provide a new score in this column. The questionnaire of the third round was sent to those willing to continue their cooperation and participation in this stage including three nurses, three diabetologists, ten professors of nursing in the country and an official of the department of endocrinology of Iran's Ministry of Health and Medical Education. Due to the nature and prolongation of the study, a number of the diabetologists, nurses and nursing professors were not willing to continue their participation in the study. A ten-day response deadline was considered for this stage. After the deadline, the participants who had not yet returned their questionnaires were determined. A reminder email was sent to the professors and these follow-ups continued until 80% of the questionnaires were returned. Questionnaires of the third round of Delphi were analyzed using descriptive statistics. In addition, the median of each of the statements was obtained, and those, on which consensus was not reach, were deleted. Thus, the final list of the duties of the graduates was obtained.

### 3.4. Ethical Considerations

The present study was approved by the ethics committee of Isfahan University of Medical Sciences, Isfahan, Iran (project code: 393503). Written consents were obtained from all participants in the first round of the modified Delphi. Oral consents were obtained from the participants in the second and third rounds of Delphi. Participants were free to cooperate with the researcher or leave the study at any time. The names of all participants and contents of interviews and questionnaires were confidential.

### 3.5. Data Analysis

The data collected from the interviews and the literature review were merged and analyzed using qualitative content analysis. Each recorded interview was listened to repeatedly, and verbatim transcript of the interview and initial coding were conducted. After the initial coding, based on continuous data comparison, similar codes were repeatedly merged and sub-categories and categories emerged in the next stage. After the continuous comparison of categories and sub-categories and integration of categories based on emerging tasks, the final categories of the duties of the postgraduate diabetes nurse emerged. The quantitative data were analyzed using descriptive statistics such as percentage, mean and median.

## 4. Results

### 4.1. First Round

In the first round of the modified Delphi approach, 52 individuals participated in the study. At this stage, 56% of

the patients were female and 44% male aged 19 to 69 years (mean age of 35 years). In terms of education, 12% had MSc degrees, 40% had BSc degrees, 16% had associate degrees, 28% had high school diploma and 4% had elementary education. The average work experience of the nurses group was 11.5 years and in the physicians group was nine years. In the patients' family group, the mean history of diabetes of the patient was eleven years. The first round lasted eight months.

#### 4.2. Qualitative Analysis

The content analysis conducted on data obtained from the interviews and an extensive literature review led to the emergence of 500 basic raw codes. Continuous data comparison led to the emergence of seven categories and eleven sub-categories (Table 1).

Duties which emerged in the first round indicated that, from the participants' perspective, one of the tasks of a postgraduate diabetes nurse is to be equipped with extensive and up-to-date knowledge in the field of education, care and management of diabetes. Nurse number 1 stated: It is important to learn how to speak based on evidence, and how to update our information. A diabetologist said: They should have enough information about diabetes, its complications, nutrition training and physical activity.

The category of professional responsibilities included the tasks of evidence-based practice, service provision without discrimination, implementation of care standards and accountability. Nurse number 5 who worked at the diabetes clinic, said: I am not saying that physicians do not perform their tasks well, but sometimes we understand the patients better, since we talk to them and communicate with them more, I understand better why the patient has a glucose drop, because I have talked to him/her for half an hour; therefore, I can find the cause. But we have limitations at the moment, because we have no official degree or defined duties.

The category of educational duties with the two sub-categories of features and aspects of self-care/self-management training was one of the tasks which emerged in the analysis of qualitative data and was considered as an important task by all participants. Patient number 5 in the focus group of patients with type 1 diabetes said: We want someone who knows our daily routine and can provide relevant training accordingly. Patient number 2 who participated in the focus group of patients with type 2 diabetes stated: My children may have diabetes in the future, but if the postgraduate nurse teaches them, these problems may occur in their 80s.

The category of caring and treatment duties is one of the classes which emerged with four sub-categories of checking the status of the patient, tracking the patient's

condition, and providing health care and support and counseling. One endocrinologist said: I think the key person in chronic diseases control is the nurse, not the physician, nutritionist, physical instructor or the psychologist. The nurse has the key role while working alongside the patient. If the nurse can be fully involved and communicate well with patients, either face to face, on the telephone, or through the internet, the patients will be able to talk about their problems.

Duties towards society and administrative tasks of postgraduate diabetes nurses refer to the role of the nurses to identify and meet the educational and supportive needs of society and the use of their administrative ability to coordinate the diabetes team members and provide the possibility of a team approach to the care and treatment of diabetes.

Nurse number 2 said, I think nurses can be good managers since they have some experiences in other fields or at least they are familiar with the context. They can establish a relationship between the team members and see the system from a higher stance. I think this is an advantage and if we are going to have someone in the team who can manage the team, that person is the nurse, not anyone else.

#### 4.3. Second Round

The nursing faculty members, who participated in the second and third rounds of the Delphi approach, consisted of 71.42% females and 28.58% males with mean age of 46.8 years. They had 16.8 years of work experience in the treatment and care of diabetes. Moreover, in the second and third rounds 50% of the participants had a PhD in nursing education, 14.5% had an MSc in nursing, 16.5% were diabetologists and 19% were nurses. In the second round of Delphi, 20 participants responded to the questionnaire. After analyzing the data, consensus (100%) was reached in 126 items, of the total 164 items (Table 2). According to the participants of the second round, 39 out of the 126 duties were similar and overlapping, thus, were eliminated. Moreover, the participants did not consider the 23 duties of the personal characteristics category and the 12 duties of the knowledge and awareness category, as the duties of postgraduate diabetes nurses, but as characteristics and required prerequisite to perform tasks. Therefore, they were also eliminated and finally 52 duties remained. The five categories and their seven sub-categories achieved in this round consisted of the professional responsibilities category, educational duty category (one sub-category: features and aspects of self-care/self-management training), caring and treatment category (three sub-categories: checking the status of the patient's care and treatment, providing health care, support and counseling), duties toward society category, and managerial category (three sub-

**Table 1.** Category and Subcategories in the First Round of the Delphi

Category	Sub-Category
<b>Knowledge and awareness</b>	Specialized knowledge in diabetes
	Knowledge in sciences related to diabetes management
<b>Professional responsibilities category</b>	-
<b>Personal characteristics category</b>	-
<b>Educational duty category</b>	Features of self-care/self-management training
	Aspects of self-care/self-management training
<b>Caring and treatment category</b>	Checking the status of the patient
	Tracking the patient's condition
	Providing health care
	Support and counseling
<b>Duties towards society</b>	-
<b>Managerial category</b>	Team working
	Coordination and monitoring
	Educational management

categories: team work, coordination and monitoring, and educational management). In this round, 18 tasks of the 164 items reached 70% consensus and these duties were transferred into the third round, in order to investigate the possibility of achieving 100% consensus. The duration of this phase, from distribution of the questionnaires until receiving them, and analyzing the results, lasted five months.

#### 4.4. Third Round

In the third round, 14 participants returned the questionnaire. The participants of this round approved five categories of the previous round and focused on revising or confirming the previous comments on the 18 tasks on which consensus was not reached. After reviewing the results, consensus was achieved on 15 tasks at an acceptable level. This round lasted one month. Finally, after reviewing the tasks obtained from Delphi rounds, eliminating duplicate and overlapping items and merging some items, and applying the participants' opinions, the final tasks list of the postgraduate diabetes nurse was obtained (appendix 1. in supplementary file).

## 5. Discussion

The study results led to 67 tasks classified into five categories of professional responsibilities, education, care and treatment, tasks in society, and tasks in management, and seven sub-categories. The job description of the graduates

should be determined based on these tasks. These job descriptions form the educational requirements of that new academic major. The objectives, and in turn, the curriculum of the academic major is developed based on these educational requirements. Thus, this study was designed in the form of a needs assessment to determine the tasks and roles of diabetes nurse specialists. Gaining extensive knowledge in the field of diagnosis, treatment, prevention and management of diabetes was obtained as one of the main tasks of diabetes nurses in this needs assessment. It is noteworthy that in this needs assessment study, physicians who treated patients with diabetes placed great emphasis on the necessity of extensive and up to date knowledge of the diabetes nurse. Thus, although this academic major is not launched in Iran yet, both the service providers and the recipients of services understood the need for nurses with extensive knowledge in the diabetes care process. In the current study, being equipped with high knowledge and expertise in the field of diabetes was determined as one of the nurses' fundamental tasks. Nevertheless, the important task of caring and educating individuals with diabetes is performed by individuals, such as nurses and non-nurses, who accepted this responsibility without participating in the required training courses. Vahedian Azimi et al. concluded that low knowledge among nurses was the most important barrier to diabetes education (23). Abazari et al. showed that contrary to the important role defined for nurses in the national plan for preventing and controlling diabetes, no specific action is taken to prepare nurses for these roles (19). Rubin et al. also



**Table 2.** An Example of Duties With Median Score Received in the Second Round of the Delphi

Items	Median Score
<b>Knowledge and awareness category Sub-category 1-1: Specialized knowledge</b>	
Comprehensive and updated knowledge in diagnosis, treatment care and follow-up diabetes complications	5
Receiving specific training on diabetic foot complications	5
Recognition medications and drug interactions in diabetes	5
Recognition new technologies in diabetes such as lasers	4
Traditional and complementary medicine in diabetes	4.5
<b>Sub-category 2-1: Knowledge in sciences related to diabetes management</b>	
Performing qualitative and quantitative research in line with promotion, prevention and care of diabetes and tracking global research	4.5
Having sufficient Knowledge of psychology in diabetes	4
Having sufficient knowledge in management science	4

showed that nurses, surgical residents and family physicians do not have the sufficient knowledge to take care of patients with diabetes (24). For this reason, in countries with diabetes nurses and in global standards of diabetes care, the need for extensive knowledge of diabetes nursing to perform care processes is emphasized (11, 25-27). In a study conducted in New Zealand, the knowledge of diabetes nurse specialists was significantly higher than that of non-specialist nurses in diabetes care and the performance of these nurses was also superior to that of non-specialist nurses (28). Therefore, graduate students in nursing require academic knowledge and specialized clinical skills for their future caring roles. Their academic education should help them integrate knowledge, manage incidents and complex situations, and develop their abilities in participating, performing, and taking advantage of research (4). Answering this need requires that both the educators and health officials cooperate and contribute to facilitating academic learning of diabetes nurses. In the current needs assessment, educational duties emerged as one of the most important duties of diabetes nurses. Moreover, not only the training axes, but also features of training self-management of patients, including the patients' educational needs, continuing training and finding the reasons for patients' lack of interest in educational classes were highlighted. The resulting tasks in the educational duties category of postgraduate diabetes nurses were similar to the training duties of diabetes nurses in international standards and standards of countries with this type of nurses (10, 11, 16, 26, 27, 29, 30). This showed the importance of these duties. In fact, diabetes specialist nurses have an important role in training, supporting, and empowering patients with diabetes in self-management in different situations (31). In the present study, all the duties in the cat-

egory of care and treatment were similar to those of the care and clinical duties of diabetes nurses in the world. This alignment illustrates the heavy responsibility of planners for this academic discipline in terms of designing a curriculum that encompasses the requirements of learners (10, 11, 15, 25-27, 30, 32-34). Bostrom (11) believes that diabetes nurses in some countries are more specialized and independent; for example the diabetes nurse consultants in the United Kingdom, certified diabetes educators in the US, and diabetes specialist nurses who run diabetes clinics in the Netherlands (32). In the present needs assessment, supportive and advisory duties were emerged as one of the main tasks of a diabetes nurse with an MSc degree. Duties obtained in the professional obligations and responsibilities category were similar to those in this category in countries with specialized nursing team for diabetes. In different literature, much emphasis is placed on the diabetes specialist nurses: duty of evidence-based performance and use of research findings based on care and treatment (16, 26, 30, 33-35). In this study, this duty was also obtained and emphasized in interviews with the patients. The current study obtained a category named nurses' duties toward society, with features such as notification and education of different sectors of society and screening for diabetes. The diabetes specialist nurses in other countries also have the same duties (33, 36, 37). In the present study, the duty of developing 24-hour diabetes clinics and working in these centers was placed in the category of nurses and society. Nevertheless, it was not found among the duties of nurses in the studied countries. In the present needs assessment, teamwork, coordination and monitoring were the main duties of diabetes nurses in the field of management. Evidently, appropriate management of diabetes is only possible through the gathering a series of elements including

the use of a team approach (38). The necessity and importance of teamwork in care, especially in caring for patients with chronic diseases, and prevention and control of diabetes were approved in multiple studies (39-41). Creating means of communication in cyberspace and coordinating information among diabetes care team members were among the extracted duties. Previous studies introduced the movement of the nursing society toward telecare as an inevitable necessity. This is due to problems related to the shortage of nurses, lack of adequate access to care services for patients and the high cost of care. On the other hand, it is related to the quality of telecare being equal to or higher than traditional care, increased patient access to care services, and thus, increased patient satisfaction, reduced healthcare costs due to reduced hospitalization frequency and length and the possibility of providing services to more patients, and a solution for the retention of nurses in the profession (42, 43). Coordination with organizations and stakeholders in diabetes care, and between the diabetes care team members and educational administrators were among the diabetes nurses' management duties obtained in the present needs assessment. Various sources, including the Canadian nurses association, believe that clinical specialist nurses have the roles of leadership, management, research and educational support among members of the healthcare team and members of the healthcare system and organization (21, 30). However, one of the main concerns of nurses in health centers or diabetes clinics is lack of coordination between diabetes care team members, at least in terms of diabetes self-management education (38). Hence, planning for the training of leadership and management models in the healthcare system is one of the fundamental educational requirements in developing a curriculum for postgraduate diabetes nursing.

Needs assessment based on the modified Delphi technique led to the illustration of a wide variety of tasks for diabetes nurses. Duties undoubtedly rooted in the real requirements of the diabetes care team; the requirements that are not met. The society expected or at least believed that nurses armed with knowledge have the ability to fulfill these needs. It seems that the results of needs assessments conducted locally and based on the current needs of the country can be applied in future planning to train professionals such as nurses. This leads to the training of nurses whose presence in the field of diabetes care with no doubt has great health, economic, cultural and social benefits in the long run. The duties developed in this study can be beneficial in the development of curriculums to train specialist nurses in diabetes care. The methodology of the present study can be applied to develop curriculum for other new majors in nursing and health allied professions.

## Supplementary Material

Supplementary material(s) is available [here](#).

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## Footnotes

**Authors' Contribution:** Parvaneh Abazari, study concept and design; Parvaneh Abazari and Sima Goudarzian, manuscript drafting; Parvaneh Abazari, Nikoo Yamani, Masoud Amini: critical revisions; Parvaneh Abazari, corresponding author; Sima Goudarzian, Searching for articles, data collection and analysis.

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