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The components of diabetes educator's competence in diabetes self-management education in Iran: A qualitative study

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Abstract:

BACKGROUND: Limited research has been conducted in the field of diabetes educator's competency. However, no comprehensive and integrated explanations of educator's competence requirements in treatment centers exist in Iran. The aim of this study is to explain the components of diabetes educator's competence in diabetes self-management education in Iran.

MATERIALS AND METHODS: This was a qualitative descriptive-exploratory study. The data were collected through semi-structured and in-depth interviews and using purposeful sampling method in Isfahan University of medical science from April to October 2018. Sampling continued until data saturation. Participants included 20 people who were selected by purposive and snowball sampling method. The interviews were analyzed using content analysis method of Graneheim, Lundman.

RESULTS: Data analysis resulted in the emergence of three main categories including (1) Patient and family centered education, (2) process-based education, and (3) continuous progress in profession and also seven subcategories (patient and family activation, empower), facilitating educational process, comprehensive education assessment, development, implementation and evaluation of educational plans, developing educators' educational knowledge and skills, development of creativity and innovation, promote inter-professional cooperation in education.

CONCLUSION: The evaluation of facilitation factors for participation and empowerment patient and family along with creativity and interprofessional collaboration for comprehensive evaluation of patients in designing, implementation of educational programs were mentioned as important competencies of diabetes educators, which can have a significant impact on patients' recovery, treatment, and the promotion of society's health.

Keywords:

Diabetes, health promotion, professional competence, qualitative research, self-management education

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Introduction

Diabetes self-management education (DSME) is an effective cost strategy in diabetes management and includes behavioral, educational, psychological, and clinical domains.^[1] The studies demonstrate effective DSME as requiring a combination of specialized knowledge, educators' technical and educational skills regarding the special

needs of the patients^[2] and the amount of provided scientific information for diabetic patients with diabetes individual features, consultancy power, and educators' skill is in contact^[1] Therefore, diabetes educators should have a collection of main skills to provide quality and valuable services which show their high skill in education provision,^[3,4] Now developed countries such as America and Australia made diabetes education standards and have developed

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necessary main competencies for diabetes education aiming at knowledge transfer and achieving the best results for the patients at international level^[5,6] and have invented mechanisms for educators' performance assessment to consider these standards.^[5,7] However, lack of coordination in educators' clinical performance domain and the difference in the competence and expertise of educators in providing standard education and counseling for diabetes management is still one of the most important challenges of health-care systems in different countries.^[4]

It must be noticed that if diabetes education is done by health and treatment specialists at various levels of education and specialty, this will endanger provision of standard education and consultancy to manage diabetes^[4] However, in developing countries, there are limited opportunities for specialized education and receiving necessary accreditation certificate to changing to a diabetes educator and development of national standards for the competence of diabetes educators according to their specific needs.^[4,8]

Regarding that the main focus in codification necessary competencies to manage diabetes is making a structure to provide minimum needed knowledge, skills and capabilities in practice in every levels of diabetes wide cares.^[9] Many studies also emphasized lack of knowledge and widespread and serious lack of knowledge of educators about methods and techniques of education and care according to the needs of patients^[8,10-12]

Therefore, studies emphasize that on providing continuous workshops on specialized educators skills for professional and nonprofessional educators in line with DSME plans promotion^[13] and easy access of educators to education instructions and updated and original educational scientific resources to provide knowledge and skill for the patients.^[14]

Furthermore, the fact that learning knowledge and skills to provide education and understand and satisfy special needs and various learning situations is of significance,^[15] one of the fundamental bases of education and the main criterion in education quality promotion is identifying the components of educators' competency to develop human resource education and management.

Regarding the fact that in the review of literature, there were not some evidence of educators' necessary competencies in DSME in Iran and since qualitative research comparing quantitative to provide one provides deep comprehensive understanding for identifying and analyzing educators' competence components, considering the subject significance and insufficient research in the field and lack of national standards and

no comprehensive integrated explanations of educators' competency necessities in DSME in Iran, the present study was conducted aiming to explain the components of diabetes educator's competence in DSME in Iran.

Materials and Methods

The present qualitative study was a part of a nursing doctoral dissertation aiming at design and develops manual process education diabetes self-management for nurse educators. The data of this study were collected from April to October 2018. This paper presents the results of the exploratory phase with the aim of defining the components of diabetes educator's competency in DSME in Iran.

Semi-structured interviews were conducted with 20 participants until data saturation. Purposive and snowball sampling was used to select participants [Table 1]. Sampling continued until data saturation (either the obtained data were repeated or the new data confirmed the previous ones).^[16] After conducting interviews with 16 participants, the data were saturated, and four further interviews were conducted to confirm the formed categories and subcategories, and finally, the data were completed. The inclusion criteria were willingness to participate in the study, holding at least a bachelor's degree, and having at least 1 year of clinical work experience in treatment, care, and education in diabetes field.

The interviews conducted by the researcher introducing themselves and a brief description of the study objectives. Length of interviews varied between 20 and 45 min and they were conducted in a peaceful place, chosen by the participants. The location and time of the interviews were determined according to the participants in their workplace, home, and office or the researcher's office. The interview guide included questions, such as "What experiences did you have in diabetes self-management education?", and "What are the characteristics of a competent educator in the field of diabetes self-management education?" To achieve deeper information, probing questions such as "please explain more," "what do you mean?" and "Please provide an example." were used. The interviews were recorded using a digital voice recorder.

Data analysis was concurrent with data collection. Data were analyzed through conventional content analysis approach. All interviews were audio-recorded and transcribed verbatim. The transcribed interviews were reviewed several times. The text was divided into meaning units. Primary codes were extracted. Through comparing the codes in terms of their differences and similarities, subcategories were extracted. Finally, the

Table 1: Demographic characteristics of the participants

Participants	n	Mean (SD)		Gender
		Age (year)	Experience in treatment, care, and education (year)	
Faculty member and PhD nursing	2	42.56 (8.42)	12.32 (8.16)	Female 14
Nursing MSc	4			Male 6
Nursing BSc	6			
Diabetes specialist	5			
Endocrinologist	3			

BSc=Bachelor of Science, MSc=Master of Science, PhD=Doctor of Philosophy

subcategories were compared and combined in case of similarity, and thus, the main categories were revealed.^[17]

The trustworthiness of data (including credibility, dependability, confirmability, and transferability) were examined using Lincoln and Guba's views. To establish the credibility of data, the researcher was involved with the yielded data of the study with different data collection methods for a long time. Furthermore, some extracted codes were checked by a number of participants and were modified if needed (member checking was employed). Moreover, interviewing with diabetes educators, nurse managers, DM specialists, and endocrinologists were used in data collection (source triangulation). Dependability of data was obtained through the reviewing of the texts, codes, and categories by the researcher's colleagues and the steps and process of the research were reported and recorded precisely as much as possible. To establish the transferability, it was attempted to reach this criterion as well through providing exact description of the population and research setting and was also done through sampling with maximum variation in terms of age, educational background, work place, academic education, and expertise. For conformability also, some interviews, and the codes and classifications were extracted and given to co-workers who were familiar with qualitative research analysis who and did not participate in the study and they were asked to examine the authenticity of the coding process.^[18]

Ethical considerations

This research was confirmed by Ethical Committee of Isfahan University of Medical Sciences (No. 396294), (IR.MUI.REC.1396.3.294). At the beginning of each interview, the aim of research, interview method, information privacy, and optional participation in the study were explained for the participants and the participants were asked to be recorded. Moreover, written satisfaction was obtained before the interview.

Results

In this study, 20 people participated, Table 1 shows their features. After data analysis, finally three main categories and seven subcategories Table 2 were obtained.

Table 2: The main categories and subcategories extracted from qualitative data

Main categories	Subcategories
Patient and family centered education	Patient and family activation and empower Facilitating educational process for patient and family
Process-based education	Comprehensive education assessment Development, implementation, and evaluation of educational plans
Continuous progress in profession	Developing educators' educational knowledge and skills Development of creativity and innovation Promote inter-professional cooperation in education

Category 1: Patient and family centered education

This main category included the two subcategories of patient and family activation and empower and facilitating educational process

Patient and family activation and empower

The participants demonstrated the most important educators' professional competencies as their in skill to evaluate readiness to learn, knowledge, attitudes and needs of patients, assess client psychological (stress), evaluate culture and support resources, and family participation and providing appropriate feedback and to evaluation understanding and learning educational content by the patient and family to promote the health and self-management of clients.

Nursing faculty member said: "... Sometimes, the patients do not mention their low literacy and the occurred sexual problems resulting from diabetes because of being shy or their special culture and the family collaboration is helpful in diagnosing patient's ability and performance ..." (P2).

Diabetes physician added: "... The elderly diabetic patients have mostly hearing loss and forget the educational material rapidly and they have problem about the time, amount and the way of insulin proper consumption, but we can ensure the patient and his/her company have learned the material by repetition and getting feedback ..." (P7).

The director of diabetes center said: "...Stress control in patient's blood sugar regulation and patient's focus on educational points is effective and patient's family

can reduce the patient's stress by spiritual support and participation in recovery process and attending the educational sessions ..." (P9).

Facilitating educational process

Participants' experience showed that effective communication is the base of patient and family activation, empower and participation in education and educator's continuous supervision and sufficient attention to all patients' educational needs result in more patients' trust on educators' knowledge, skills and abilities and this causes patient's mental relaxation and independence and his/her follow-up and adherence to treatment. Therefore, one of the educators' competencies was demonstrated as effective and on time communication.

Faculty member said: "...Using medical expressions by educators, ethnic variety, different traditions and dialects cause problems in educators' communication with the patients and their families; communication is the education tool, our educators are not familiar with these principles and or they do not use the skill ..." (P6).

Endocrinologist added: "...The educator can by effective communication attract the patient's trust and participation in considering the diet and medicines ..." (P20).

A nurse said: "...The educator can diagnose hearing and sight losses in the cases that the patient tries to hide them through communicating in a friendly way ..." (P1).

Furthermore, the participants considered provision of a supportive-educational environment with appropriate facilities as facilitators of patient's participation in education and emphasized on special focus on expressed educational needs by the patients and or the needs felt by educators.

The diabetes physician said: "...In my opinion, an educator can provide the necessary background for patient's education and participation with a comfortable peaceful environment with enough light and appropriate temperature ..." (P19).

Category 2: Process-based education

This main category included the two subcategories of comprehensive education assessment and Development, implementation, and evaluation of educational plans.

Comprehensive education assessment

The participants mentioned educators' competencies in skills in individual needs assessment and personalization of education, skills in assessing patients' perceptions and learning styles, structured educational planning, adult teaching and learning process, patient performance evaluation, application of various educational techniques

appropriate to the specific needs of patients, the use of teaching aids and materials, formative, and summative evaluation of education) as other cases of educators' competencies.

Faculty member said: "...The educator must have a comprehensive assessment of his teaching process. different patients have special needs and various learning styles, and individualization of education is one of the basic principles of adult education ..." (P12).

Nurse educator said: "...the educator can identify many of the patient's needs at the very beginning of the training by individual needs assessment of the patient and facilitate the patient's education and learning process by structured planning and using various teaching techniques and tools ..." (P17).

Development, implementation, and evaluation of educational plans

Participants emphasized the skills, ability and competence of educator in designing and structured educational planning, implementing and evaluating a training program. According to the participants, the educator should have a comprehensive understanding of the patient education process and disease-related problems, and using a structured educational planning and applying educational techniques and tools, appropriate to the learning style and problems related to patient self-management, minimize possible complications and other problems related to the disease such as (hypo and hyperglycemia, neuropathic injuries, et...).

Diabetes educator's added: "...In my opinion, educator when planning and education the patient and family must emphasize the use of acoustic glucometers to express blood sugar in patients with reduced vision and the use of medication calendar kits in diabetic patients with memory loss to prevent forgetfulness Or mistakenly taking similar drugs in patients ..." (P15).

Endocrinologist added: "...Carbohydrate counting may be difficult for the patient, but the educator can greatly influence the recovery process by simplifying education the intake of carbohydrates, protein and daily fluids during planning and education ..." (P13).

Diabetes educator's added: "...Appropriate use of education techniques and tools increases the patient's motivation to learn, so an educator should use these at the right time and in accordance with the patient's needs and how to learn ..." (P5).

Category 3: Continuing professional development

This main category included the 3 subcategories of developing educators' educational knowledge and skills and development of creativity and innovation and Promote inter-professional cooperation in education.

Developing educators' educational knowledge and skills

Participants' experience showed that continuing professional development and upgrade knowledge and skills educational and awareness of personal and professional weaknesses and strengths have a positive effect in their scientific and practical competency upgrade in the field of DSME. Using the opportunities to develop personal and professional education in DSME, sufficient commitment and motivation in diabetes field, accepting criticism and promoting self-education skills in diabetes theoretical knowledge domain and educational skills to be professional in education DSME were demonstrated as other educators' competencies.

Diabetes educator said: "...When I started education the patients, little by little I understood my weaknesses and strengths and I tried to promote my knowledge and skill in DSME education using different resources ..." (P11).

Faculty member said: "...because of treatment personnel performance domain becoming proprietary, many educators feel sufficient motivation and tendency to promote their knowledge and skill in the field of DSME and participate eagerly in educational workshops and programs ..." (P8).

Development of creativity and innovation

The participants mentioned having creativity and innovation spirit in the educators as effective in continuous progress in the profession and educators' competencies promotion. They believe that the educators facing various educational conditions and situations and diverse learning styles and patients' special needs, educational resources shortage, barriers to inter-professional collaboration, and lack of appropriate educational environment for the patients must challenge what they learned before and searching new, effective and efficient educational solutions give new creative solution for every new educational situation.

Educational supervisor stated: "...Through being creative in designing standard form of education for patients and establishing a format to record patients' various features, needs and learning styles we can use it as a communication tool to share information and inter-professional collaboration and focus on patients' special needs ..." (P1).

Diabetes physician added: "...Based on my experience, I use imaging to educate my patients ..." (P4).

Nurse educator stated: "...In group sessions, I encourage my patients to share their experience of diabetes treatment so that all get more information about different treatment solutions and how to face the side effects and help their recovery ..." (P14).

Promote interprofessional cooperation in education

Participants mentioned interprofessional collaboration in education as one of the basic competencies of educators

for continuous advancement in the profession. They demonstrated independent presenting educational content and lack of motivation and tendency to inter-professional collaboration and interaction as what results in not achieving educational goals, content repetition and sometimes no new educational content, lack of satisfaction and reduction of motivation and tendency of patients to participate in educational sessions.

A nurse said: "...When there is no effective communication and cooperation between doctor and nurse and nutritionist and pharmacologist, the patient is confused and many educational content are either repeated or not taught to the patient at all, because the necessary coordination for the presentation of educational content by specialists with profession is not done ..." (p10).

Endocrinologist added: "...education needs inter-professional collaboration because lack of inter-professional collaboration results in content repetition and motivation reduction to participate in educational sessions ..." (P20).

Faculty member said: "...Inter-professional collaboration in providing education results in material integrity; we can help educational qualitative promotion through inter-profession continuous meetings and demonstrating and understanding the roles of different professions in DSME process ..." (P16).

Discussion

This study is the first qualitative study in Iran to examine diabetes educators' competency dimensions in DSME. The study findings showed that the participants considered patient and family-centered education, process-based education, and continuous progress in profession as the most significant educators' competencies.

The results of the present study showed that one of the competencies of diabetes educators is to provide patient and family-oriented education and given that the key point in DSME is the individualization of education with patient and family participation and the application of a wide range of learning strategies based on adult learning theories as well as psychosocial and behavioral theories.^[19]

Therefore, in order to facilitate the education process, educators need the necessary skills and competence in assessing the needs and assessing the readiness of patients, individualization of education and evaluation of support resources, participation and empowerment of patients and families, assessment of comprehension and learning content and providing feedback to activate and empowerment and promotion of motivation, knowledge and confidence of the patient and family to participate

in self-management. Numerous studies have considered the participation of patients and families in the planning, implementation, and evaluation of education to be necessary for the patient to adhere to treatment and achieve better treatment results.^[20-23]

Participants in the present study considered the lack of access of patients and families to educational resources and programs as an obstacle to patient and family participation, which is in line with several studies.^[20,24-26]

Effective education requires timely detection of the basic needs of patients and providing clear and transparent information to patients to gain their trust through communication. Participants in the present study stated that to establish effective communication and provide facilities, space and standard conditions of the educational environment, is one of the competencies required of educators for structured educational planning focusing on unique needs and specific learning goals. Numerous studies, in line with the present study, have expressed the appropriate educational environment and the availability of educational facilities and providing education based on a step-by-step approach^[27,28] and effective communication^[29-31] as effective and facilitating factors in patient and family participation in the education process.

Whereas, participants in the present study expressed that process-based education, use of comprehensive educational evaluation tools, identifying patients' needs and facilitating their learning by personalizing education and adapting educational methods to the learning style and special needs of patients and families, formulating or designing educational programs, strategies and interventions to help patients and families to self-manage and identify supportive techniques for learning and remembering educational content and involving them in treatment process and spiritual support as educators' fundamental competencies, the previous studies have confirmed this result.^[19,32,33]

The participants believe, other competencies of diabetes educators are their skills and expertise in the field of educational principles and skills and benefiting from up-to-date knowledge, this leads to participation, empowerment, increasing trust and independence, promoting patient and family health, and continuous professional development of educators, in line with the results of the present study, the studies also emphasize the combination of technical skills and professional knowledge of educators and the use of specialized knowledge in the field of diabetes management and community health based on educational principles and skills.^[2,4,34] Therefore, it seems that by continuously holding online modules and other specialized training

programs based on the practical and e-learning approaches available, it is possible to update the knowledge of diabetes educators and increase their self-confidence in education.

Educators' creativity, innovation and ability in providing education by applying advanced technology in nowadays according to educational environment limitations and lack of educational resources and equipment were mentioned one of the educators' competencies to make continuous progress in profession which affects the quality of education.

It seems that educators can improve the effectiveness of education by innovating in education programs and using intervention education strategy through Facebook or Instagram or virtual reality games. Many studies also in line with the present study mentioned applying iPad and educational films^[35] and creative use of book, backgammon, and snake and ladder and using educational handout, educational excursions, and group discussions among creative cases in DSME.^[36,37]

Participants identified interprofessional collaboration as another important competence of educators for continuous professional development and diabetes management, also multiple studies have found interprofessional collaboration to be effective in improving patients' treatment outcomes.^[38,39]

In the present study, insufficient inter-professional communication and lack of motivation of coaches due to (lack of appropriate roles and models for inter-professional collaboration, lack of transparency in explaining different roles of diabetes educators' and differences in appropriate rewards and salaries) are often cited as reasons for lack of inter-professional collaboration. Participants considered DSME inter professional collaboration to be insufficient at present, and they considered it necessary sought to clarify the different roles of educators and increase each profession's understanding of inter professional collaboration and improve the quality of inter professional collaboration to enhance patient and family learning motivation and non-repetition of materials and coherence of educational content. In addition, the result of studies reveal that effective teamwork and professional communication are of great importance in care delivery,^[38,40,41] which is in agreement with experiences of participants of the present research.

Therefore, the proposed solutions of the present study are to improve the competencies and empowerment and development of key competencies of diabetic educators, effective communication, and providing a suitable educational environment to ensure patient and

family comfort for empowerment and patient and family participation, structured individual patient education and family based on each individual's specific needs, involvement of a family member in practical education, facilitate patient participation in group sessions and group cohesion considering group dynamics , Use a combination of methods and tools to provide diabetes education, Interact and establish mutual respect, respect for individual views; Trying to find common field with the patient; continuous professional development along with creativity and innovation interprofessional collaboration and convergence of health-care professionals and promotion of their practical knowledge and convergence of patients' empirical knowledge with the practical knowledge of educators and scientific-theoretical knowledge of researchers, which is likely to lead to practical and sustainable interventions for diabetes self-management. In this regard, the previous study have confirmed this result.^[42] Also emphasize the convergence of patients' empirical knowledge with the practical and theoretical knowledge of educators and researchers.

Qualitative approach in this study limits the findings generality. In addition, diabetes educators' competency elements and components in this study are under the effect of nursing experiences, physicians and endocrinologists participating in the present study. However, selection of the participants from different provinces, working backgrounds, and forms of DSME experiences assisted in ensuring that the findings are broadly applicable to the context of DSME in Iran. In addition, it is recommended that future studies examine the patients and family.

Conclusion

The present study explains the educators' required competencies for DSME in Iran, regarding that diabetes educators' competency and ability is an effective factor in diabetes control and management and society health promotion, so these findings can be used as a base for compilation diabetes educators' competency assessment questionnaire. In addition, diabetes educators can use these findings for their personal and professional progress in the field of DSME and the politicians and managers in society health promotion will also be able to design and implement their managerial and educational activities to develop diabetes educators' competency using comprehensive approach and necessary investment to have the maximum use of educators' knowledge and skill.

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Conflicts of interest

There are no conflicts of interest.

References

1. Powers MA, Bardsley J, Cypress M, Duker P, Funnell MM, Fischl AH, *et al.* Diabetes self-management education and support in type 2 diabetes. *Diabetes Care*, 2015; 38:1372-1382 | doi: 10.2337/dc15-0730.
2. ADA. American Diabetes Association, 5. Lifestyle management: Standards of medical care in diabetes—2019. *Diabetes Care*, 42(Supplement 1), S46-S60. doi: 10.2337/dc19-S005.
3. Walsh N, George S, Priest L, Deakin T, Vanterpool G, Karet B, *et al.* The current status of diabetes professional educational standards and competencies in the UK—a Position Statement from the Diabetes UK Healthcare Professional Education Competency Framework Task and Finish Group. *Diabetic Medicine*. 2011;28(12):1501-7.
4. Alharbi T, McIntyre M, Thomacos N, McLelland G. Core competencies for diabetes educators: A scoping review protocol. *JBI database of systematic reviews and implementation reports*. 2018;16(6):1381-6. doi: 10.11124/JBISIRIR-2017-003503.
5. Australian Diabetes Educators Association(ADEA). National Core Competencies for Credentialed Diabetes Educators 2008a. [Last accessed on 2016 Aug 09].
6. American Association of Diabetes Educators (AADE). Competencies for diabetes educators and diabetes paraprofessionals: A companion document to the practice Levels for Diabetes Educators & Diabetes Paraprofessionals. 2016.
7. Beck J, Greenwood DA, Blanton L, Bollinger ST, Butcher MK, Condon JE, *et al.* 2017 National standards for diabetes self-management education and support. *Diabetes Care* 2017;40:1409-1419 , doi.org/10.2337/dci17-0025.
8. Alotaibi A, Al-Ganmi A, Gholizadeh L, Perry L. Diabetes knowledge of nurses in different countries: An integrative review. *Nurse education today*. 2016;39:32-49. doi: 10.1016/j.nedt.2016.01.017.
9. Simmons D, Deakin T, Walsh N, Turner B, Lawrence S, Priest L, *et al.* Competency frameworks in diabetes. *Diabetic Medicine*. 2015;32(5):576-84. doi: 10.1111/dme.12702.
10. Abazari P, Vanaki Z, Mohammadi E, Amini M. Inadequate investment on management of diabetes education. *Journal of research in medical sciences: The official journal of Isfahan University of Medical Sciences*. 2012;17(8):792.
11. Kashani F, Abazari P, Haghani F. Challenges and Strategies of Needs Assessment Implementing in Diabetes Self-management Education in Iran: A Qualitative Study. *Iranian Journal of Nursing and Midwifery Research*. 2020;25:437-43. doi: 10.4103/ijnmr.IJNMR_10_20.
12. Soltani-Molayaghobi N, Abazari P, Taleghani F, Iraj B, Etesampour A, Zarei A, *et al.* Overcoming challenges of implementing chronic care model in diabetes management: An action research approach. *International journal of preventive medicine*. 2019;10:13,1-6, doi: 10.4103/ijpvm.IJPVM_485_18.
13. Modic MB, Vanderbilt A, Siedlecki SL, Sauvey R, Kaser N, Yager C. Diabetes management unawareness: What do bedside nurses know? *Applied Nursing Research*. 2014;27(3):157-61. doi: 10.1016/j.apnr.2013.12.003.

14. Burke SD, Sherr D, Lipman RD. Partnering with diabetes educators to improve patient outcomes. *Diabetes, metabolic syndrome and obesity: Targets and therapy*. 2014;7:45-53. doi: 10.2147/DMSO.S40036
15. Sleezer CM, Russ-Eft DF, Gupta K. *A Practical Guide to Needs Assessment*. 2014;3rd ed. Edition (San Francisco: By John Wiley & Sons, Inc; 2014).
16. Houghton C, Murphy K, Shaw D, Casey D. Qualitative case study data analysis: An example from practice. *Nurse researcher*. 2015;22(5):8-12. doi: 10.7748/nr.22.5.8.e1307.
17. Graneheim UH, Lundman B. Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. *Nurse education today*. 2004;24(2):105-12. doi: 10.1016/j.nedt.2003.10.001.
18. Streubert HJ, Carpenter D. *Qualitative research in nursing: Advancing the humanistic imperative* (5th ed.) Philadelphia: Wolters Kluwer, Lippincott Williams and Wilkins.; Lippincott Williams & Wilkins; 2011.
19. Pinchera B, DelloIacono D, Lawless CA. Best practices for patient self-management: Implications for nurse educators, patient educators, and program developers. *The Journal of Continuing Education in Nursing*. 2018;49(9):432-40. doi: 10.3928/00220124-20180813-09.
20. Chen J, Mullins CD, Novak P, Thomas SB. Personalized strategies to activate and empower patients in health care and reduce health disparities. *Health Education & Behavior*. 2015;25:(1-10). doi: 10.1177/1090198115579415.
21. Lange K, Swift P, Pańkowska E, Danne T., International Society for pediatric and Adolescent Diabetes. ISPAD Clinical Practice Consensus Guidelines 2014. Diabetes education in children and adolescents. *Pediatr Diabetes* 2014;15(Suppl 20):77-85. doi: 10.1111/pedi.12187.
22. Robinson D, Luthra M, Vallis M. Canadian diabetes association clinical practice guidelines expert committee. Canadian diabetes association 2013 clinical practice guidelines for the prevention and management of diabetes in Canada. *Can J Diabetes*. 2013;37 Suppl 1:S1-212.
23. Parchman ML, Zeber JE, Palmer RF. Participatory decision making, patient activation, medication adherence, and intermediate clinical outcomes in type 2 diabetes: A STARNet study. *The Annals of Family Medicine*. 2010;8(5):410-7 doi: 10.1370/afm.1161.
24. Abazari P, Vanaki Z, Mohammadi E, Amini M. Barriers to effective diabetes self-management education. *Iranian Journal of Medical Education* ,2013;13:221-32.
25. Martin D, Lange K, Sima A, Kownatka D, Skovlund S, Danne T, *et al*. Recommendations for age-appropriate education of children and adolescents with diabetes and their parents in the European Union. *Pediatr Diabetes* 2012;13:20-8.
26. Lange K, Klotmann S, Saßmann H, Aschemeier B, Wintergerst E, Gerhardsson P, *et al*. A pediatric diabetes toolbox for creating centres of reference. *Pediatric diabetes*, 2012;13 Suppl (16):49-61. doi: 10.1111/j. 1399-5448.2012.00913.x.
27. Kalantari S, Najafi MK, Abbaszadeh A, Sanagoo A, Borhani F. Nurses' Perception of Performance of Patient Education. *Quarterly Journal Scientific research jentashapir*. 2012;2(4):167-74.
28. Ramezanli S, Badiyepaymaie- Jahromi Z. Iranian Nurses' Views on Barriers and Facilitators in Patient Education: A Cross-Sectional Study. *Global Journal of Health Science*. 2015;7(5):288-93. doi: 10.5539/gjhs.v7n5p288.
29. Peltola M, Isotalus P, Åstedt-Kurki P. Patients' interpersonal communication experiences in the context of type 2 diabetes care. *Qual Health Res* 2018, 00(0): 1-16. doi: 10.1177/1049732318759934 .
30. Kashani F, Moghimian M, salarvand S, kashani P. Nurses' knowledge, Attitude, Practice about Effective Communication Skills in Patient Education. *Journal of Research Development in Nursing & Midwifery*. 2015;12(2):59-67[Article in Persian].
31. Irajpour A, Farzi S, Saghaei M, Ravaghi H. Effect of interprofessional education of medication safety program on the medication error of physicians and nurses in the intensive care units. *Journal of Education and Health Promotion*. 2019;8(196):1-12. doi: 10.4103%2Fjehp.jehp_200_19.
32. Coulter A, Entwistle V, Eccles A, Ryan S, Shepperd S, Perera R. Effects of personalised care planning for people with long-term conditions. *Cochrane Database of Systematic Reviews*. 2015;3;3:1-96, doi: 10.1002/14651858.CD010523.pub2.
33. Yousefi H, Ziaee ES, Golshiri P. Nurses' consultative role to health promotion in patients with chronic diseases. *Journal of Education and Health Promotion*. 2019;8(178):1-19, doi: 10.4103/jehp.jehp_146_19.
34. Farzi S, Shahriari M, Farzi S. Exploring the challenges of clinical education in nursing and strategies to improve it: A qualitative study. *Journal of education and health promotion*. 2018;7(115):1-19, doi: 10.4103%2Fjehp.jehp_169_17.
35. Krall JS, Donihi AC, Hatam M, Koshinsky J, Siminerio L. The nurse education and transition (NEAT) model: Educating the hospitalized patient with diabetes. *Clin Diabetes Endocrinol*, 2016;2(1);1-6, doi: 10.1186/s40842-016-0020-1.
36. De Sousa F, Jackson J, Knight R, Cloutier E, Basa R, Fournay A, *et al*. A social media intervention to improve hypoglycemia management at a multicenter hospital: A quality improvement pilot for clinical nurses. *Contemp Nurse* 2018;54(1):44-51. doi: 10.1080/10376178.2018.1440180.
37. Sarda A. Creativity and diabetes Education: Essentiality, impact and way forward. *Indian J Endocrinol Metab* 2015;19: Suppl 1:26-8. doi: 10.4103/2230-8210.155363.
38. Gucciardi E, Espin S, Morganti A, Dorado L. Exploring interprofessional collaboration during the integration of diabetes teams into primary care. *BMC Fam Pract* 2016;17(1):12. doi:10.1186/s12875-016-0407-139.
39. Farzi S, Saghaei M, Irajpour A, Ravaghi H. The most frequent and important events that threaten patient safety in intensive care units from the perspective of health-care professionals'. *Journal of Research in Medical Sciences*: 2018;23:104:1-11, doi: 10.4103/jrms.JRMS_140_18.
40. Farzi S, Irajpour A, Saghaei M, Ravaghi H. Weak Professional Interactions as main Cause of Medication Errors in Intensive Care Units in Iran. *Iranian Red Crescent Medical Journal*. 2017;19:1-7.
41. Kishimoto M, Noda M. The difficulties of interprofessional teamwork in diabetes care: A questionnaire survey. *Journal of multidisciplinary healthcare*. 2014;7:333-9:1-13, doi: 0.2147/JMDH.S66712.
42. Pekonen A, Eloranta S, Stolt M, Virolainen P, Leino-Kilpi H. Measuring patient empowerment—A systematic review. *Patient Educ Couns* 2020;103(4):777-87. doi: 10.1016/j.pec.2019.10.019.