Diabetologist's core competence curriculum: A position statement of the amd (Italian association of medical diabetologists)

Musacchio N[1*#], Candido R[2], Cimino A[3], De Micheli A[4], Giancaterini A[5], Monge L[6], Ozzello A[7], Pellegrini MA[8], Ponziani MC[9], Ragonese M[10], De Cosmo S[11], Russo GT[12], Suraci C[13] & Zilich R[14]

ABSTRACT

Background: The management of chronic diseases requires integrated, patient-centered, medicine, technological and therapeutic innovation, as clearly explained in all chronic management models, such as the Chronic Care Model (CCM). The Italian association of medical diabetologists (AMD) started the project "Diabetes Intelligence" (DIA&INT), aiming at identifying and ranking major competences required by modern diabetologists to implement the CCM. Methods: A step-based approach was adopted: 1) identification of 25 activities 19 outcomes for optimal practice in diabetology, obtained from national guidelines for diabetes care; 2) ranking of the activities according to specificity, through digital questionnaires administered to a set of diabetes specialists; 3) assessment of the Social Return on Investment (SROI) of the activities to estimate their impact on the outcomes; 4) annotation of the knowledge and skills requirements for each activity, as reported by the Italian guideline for diabetes care; 5) evaluation of the collective degree of specificity and priority of each activity. Results: All results are based on the answers provided by 211 AMD diabetologists. The top 4 activities, educational therapy, personalized therapeutic plan, biomedical evaluation and assessment of fragility obtained excellent scores in terms of intensity and pervasivity showing a high sphere of influence. The activities judged as more specific were: the definition and management of personalized treatment plans, and the diagnostic and specialist evaluation - or the biomedical assessment. From these results, it emerges that the specific competence of the diabetologist is strongly associated with the ability to make patients participate and take charge of their own .condition. Conclusions: This project allowed the definition of a Core Competence Curriculum for diabetology specialists, formally approved as a position statement by the AMD. This effort highlights the relationship between assets/knowledge/skills and outcomes in diabetology, through the application of a rigorous scientific method, as required by the logic of the CCM.

[1]*Past President of the Associazione Medici Diabetologi (AMD), President of "Fondazione AMD" - Italy*

[2]*SS Centro Diabetologico Distretto 3, Azienda Sanitaria Universitaria Integrata di Trieste, Trieste - Italy*

[3]*UO Diabetologia, ASST degli Spedali Civili di Brescia, Brescia - Italy*

[4]*ACISMOM, Genova - Italy*

[5]*Diabetology service, Muggiò Polyambulatory, Azienda Socio Sanitaria Monza, Monza - Italy*

[6]*SSD Gestione Complicanze del Diabete - Piede Diabetico, AOU Città della Salute e della Scienza di Torino, Presidio CTO, Torino - Italy*

[7]*SSVD Diabetologia e Malattie Metaboliche, Ospedali Riuniti di Pinerolo ASL T03, Pinerolo - Italy*

KEYWORDS

- **diabetologist's core competence curriculum**
- **chronic care model(ccm)**
- **social return on investment (sroi)**

[8]*CdA Fondazione AMD, New Coram Udine, Udine - Italy*

[9]*SC Endocrinologia, AOU Maggiore della Carità, Novara - Italy*

[10]*UOS2 Centri diabetologici, ACISMOM, Roma - Italy*

[11]*Department of Clinical Sciences, Fondazione IRCCS "Casa Sollievo Della Sofferenza", San Giovanni Rotondo - Italy*

[12]*Dipartimento di Medicina Clinica e Sperimentale, Policlinico Universitario, Messina - Italy*

[13]*UOSD Diabetologia, Ospedale San Paolo, Civitavecchia, Roma - Italy*

[14]*Partner Mix-x, Milano – Italy*

[#]*Document approved and validated by the National Executive board of AMD 2015-2017*
[*]*Author for correspondence: nicoletta.musacchio@gmail.com*

Introduction

The prevalence of diabetes is growing all over the world. In Italy diabetes prevalence showed a continuous growth, from 2.5% in the late 80s to the current 6.2%, with an exponential increase in economic and social costs [1-5]. In this long period, the recognition of the great genetic and phenotypic heterogeneity of diabetes, as well as the advent of novel therapeutic and technological supports, has profoundly changed the way of managing diabetes care to a highly personalized approach. Furthermore, in addition to its acute and long-term sequelae, diabetes is also complicated by a strong "invasiveness" into the patients' lives, as it requires continuous adoption of an appropriate lifestyle and the acquisition of several self-care abilities [6-8]. Hence, there's the need for expert and dedicated professionals, able to manage the setting of highly personalized therapies, to balance cost-effectiveness in the context of multiple therapeutic options, but also to implement specific educational interventions aiming to maximize patients' autonomous daily management of the disease [9]. Furthermore, the need to deal with a large numbers of patients requires the adoption of ad hoc organizational models, involving multiple disciplines and specialists, an effective continuity network of care and, above all, the presence of professionals able to organize and practice these activities. In Italy, a valid and widespread diabetological healthcare network is already in place, demonstrating good results when compared to its international counterparts [10]; on the other hand, there is an ongoing revaluation of the national healthcare system, which will undoubtedly affect also the diabetology field. Furthermore, consistent with the current economic pressure favoring saving welfare models, there is a constant demand for the progressive application of multidisciplinary and multi-professional models of chronic care, such as the Chronic Care Model (CCM) [11]. On top of everything, the role of the diabetologist has never been officially outlined in its peculiarity, effectiveness and efficiency [12]. Considering these aspects, it is fundamental to settle the virtuous and specific actions for the best diabetological practice, so that they can be acknowledged and monitored by the establishment, hopefully, demonstrating the benefits of having diabetologists in the leading role of a multidisciplinary team of health professionals.

Notably, to date, the diabetologist lacks a Core Competence Curriculum, a fundamental tool to promote effective integrated healthcare models, with clear indications of skills, tasks and responsibilities. Since 1996 the Italian Association of Diabetologists (Associazione Medici Diabetologi - AMD), involving more than 222 diabetes centers spread all over the national territory, has settled several projects in order to constantly monitor and ameliorate diabetes care in Italy [13,14]. In this line, the AMD has therefore decided to take action with a project named Diabetes Intelligence (DIA&INT) [15], which can be divided into 4 areas of intervention (**TABLE 1**): i. creation of a list of tasks, ranked according to their ability to implement the CCM in diabetology; ii. definition of a Core Competence Curriculum for the diabetologist; iii. identification of the possible incongruences between the ideal (priority activities) and the real situation (frequency of the activities); iv. construction of a three-dimensional analysis examining the relationship between priority, specificity and frequency for each activity. Assessment of the social impact of the activities to estimate their impact on the outcomes was performed with the Social Return on Investment (SROI) method. This method [16] was created by the British Government in 2008 within a three-year program dedicated to the measurement of social value, and it currently refers to the product of a consortium of organizations that affects several Countries and Continents [17]. Its value

lies in the availability of a complete structure, which allows a very detailed analysis and a strong involvement of the stakeholders in the evaluation process.

This article describes the scopes of the DIA&INT project, and the specific list of competences of the Core Competence Curriculum in diabetes knowledge and skills, the degree of specificity, and the relative priority for each activity, based on their positive influence over the desired health outcomes, and the actual implementation of the CCM (SROI analysis of the activities of diabetology). All results have been based on the consultation provided by 211 AMD diabetologists who completed an online questionnaire survey (CAWI) [15].

Materials and Methods

■ Number of participants and validity of the sample

As for population sampling, 211 active AMD members volunteered to provide their assessments through the completion of a survey [15]. This cohort is a statistically significant sample, as we calculated that we needed a minimum of 211 participants in order to ensure 6% absolute precision and 95% confidence [18], based on the formula [19]:

$$\frac{\frac{z^2 \times p(1-p)}{e^2}}{1+\left(\frac{z^2 \times p(1-p)}{e^2 N}\right)}$$

Where N=population size, which we set to 1000; e=margin of error (as a decimal), which we set to 6%, z=confidence level (as a z-score), which we imposed at 95%, and p=percentage value (as a decimal), which signifies the percentage of samples picking a particular answer. We imposed a neutral value of p=0.5, because this survey had never been issued prior this instance, and it contained more than one question (and therefore more than one percentage value to evaluate). This produces a sample size estimate that is neither too conservative nor too loose. Finally, the data were stratified in clusters according to geographic location, gender, age, type of specialization and type of institution.

■ Activities and outcomes at the core of all DIA&INT analyses

All evaluations of DIA&INT refer to activities and outcomes in diabetology. Twenty-five activities, and their references list in literature were extracted from the national AMD-SID Standards of Diabetes Care document (**TABLE 2**) [20]. Nineteen outcomes were selected by using the National Diabetes Plan and the Patients' Manifesto (official documents from the Italian

Table 1. Schematic characterization of the Diabetes Intelligence (DIA&INT) project.

Areas of intervention	Mode of implementation	Product
Priority: Identification of the ideal Model to highlight priority Activities in diabetology. The priaority ranking depends on how and how much each activity can positively influence the Outcomes.	The SROI model of analysis was chosen, a specific instrument to measure the value produced by social and non-economic activities. The health Outcomes of diabetology activities fall within this category.	SROI model for diabetology
Specificity: Identification of the specific Competences* and of the priority Competences** of the diabetologist.	The activities that pertain molt specifically to the diabetologist were identified (through a survey); then, the skills required to perform the most specific activities were defined. Finally, the SROI method supplied a priority score for the activities, through which the most important competences could be identified.	Proven Curriculum of the diabetologist
Frequency: Analysis of the existing gap between the Ideal Model and Reality.	Through the survey, the most frequent activities of the diabetologist were identified, then these results were compared to the Priority ranking (SROI).	Gap analysis
Tridimensional Analysis: Integration and comparison of the Ideal Model with the Specificity Analysis and Reality.	For each activity, the consistency of the results for Priority, Specificity and Frequency was assessed.	Tridimensional Analysis: priority, specificity and frequency

*Specific Competences: essential to the diabetologist,
**Prioritary Competences: required for the priority activities,
SROI: A8Social Return On Investment.

Table 2. Activities of the diabetology team.	
DIA&INT code	**Description**
A1	Ensuring specialist diagnosis and biomedical evaluation
A2	Evaluation of the individual's psychosocial condition (economic, social, cultural factors, etc)
A3	Evaluation of frailty (age, ethnicity, gender...) and other factors conditioning diabetes management
A4	Definition and sharing of the therapeutic goals with the person affected by diabetes
A5	Ensuring educational therapy as an integral part of the care plan
A6	Ensuring screening and treatment of chronic complications
A7	Implementing clinical protocols for the prevention and treatment of diabetological emergencies (hypo-hyperglycemia, foot)
A8	Managing hyperglycemia during pregnancy (gestational and pre-gestational diabetes) – Postpartum follow-up of women with gestational diabetes – pregnancy planning and contraception
A9	Defining and manage the appropriate personalized treatment plan (metabolic objectives, personalized drug therapy, nutritional medical therapy)
A10	Managing adolescent transition to adult diabetology service
A11	Securing diabetological care in hospitalized patients (critical and non-critical conditions
A12	Ensuring the structuring of self-monitoring (prescriptions, dispensing, registration, education, interpretation of the results, testing)
A13	Implementing screening and prevention programs for type 2 diabetes
A14	Implementing programs for improving lifestyle
A15	Evaluation and treatment of cardiovascular risk factors
A16	Favoring autonomy in the management of therapy (including insulin pumps)
A17	Implementation of self-help protocols for metabolic emergencies
A18	Adoption of markers and indices for the periodic evaluation of performance and quality of care
A19	Recording the data in a computerized and shared medical file
A20	Guaranteeing training paths for the use of technologies
A21	Guaranteeing legal medical certification activities
A22	Promoting the application of team building logic
A23	Understanding and sharing company strategies
A24	Securing correct on and off-site communications
A25	Proper orthoses prescription

Ministry of Health) (**TABLE 3**) [9,21]. Referring to official documents and experts to determine activities and outcomes ensures the pursue of an "evidence-based" rationale, guaranteeing rigorous objectivity and avoiding self-referencing.

■ Computation of SROI: Impact of the activities on the outcomes, according to the CCM

The DIA&INT project aimed at ranking the activities, usually performed in clinical practice, considering their global impact on diabetology, in addition to the specific results, with the final goal to favor a real implementation of a sustainable chronic management model. To ranking the activities, AMD specialists were asked to attribute a score to each item, as specified below:

- A value based on the importance of each of the 19 outcomes (1 = little, 2 = enough, 3 = very, 4 = very much);

An evaluation, for each of the 25 activities of their influence over each outcomes (0 = not at all, 1 = little, 2 = enough, 3 = very, 4 = very much). Finally, the SROI [16] score for each activity was computed based on:

- 'How much' the specific activity affects every single outcome of diabetology. We can define this dimension as 'intensity' of the activity;
- 'How many' outcomes are affected by the specific activity. We can define this dimension as 'pervasivity';
- The importance of the different outcomes affected by the specific activity.

Notably, the 25 entries were composed of a

mix of biomedical, clinical and management activities, consistent with the CCM guidelines. For each activity, biomedical or non-biomedical, we calculated the degree of influence over all the outcomes set for diabetology. The implementation of the SROI analysis allowed us to attribute, to each activity, an overall score that represents the 'sphere of influence' of that specific activity over the outcomes. The activities showing high pervasivity or high intensity obtained a higher score.

■ Identification of specific diabetology activities

Analysis of specificity allowed us to identify which activity required the specific skills of the diabetologist and to what extent. The ultimate goal of this evaluation was to identify the activities for which it is essential to possess specific specialized knowledge/skills in diabetology, and the knowledge/skills that support the most specific activities. For this categorization, the CAWI survey questionnaire asked the diabetologists to select 10 activities, among the 25 listed, they considered absolutely specific. The aim of this specificity evaluation was to produce a Core Competence Curriculum with a clear indication of the activities and skills relevant to diabetologist, and to enable the future creation of a multidisciplinary team curriculum that would uniquely identify the specificity and complementarity of all the health-professionals involved.

■ Creation of the core curriculum of the diabetologist

The method for the creation of the Core Competence Curriculum of the diabetologist consisted in:

1. Selection of 25 referral activities (**TABLE 2**);

Description of knowledge/skills required for each activity, based on the clinical recommendations of the Italian Standards for the Treatment of Diabetes Mellitus [20];

Indication of the relative ranking for priority, specificity, and ability to concretely implement the CCM (SROI evaluation of the global impact on diabetology outcomes) for each activity.

Table 3. Outcomes of the diabetology team.

DIA&INT code	Description
O1	Optimisation of patient-specific metabolic control (personalisation of treatment goals)
O2	Screening and treatment of cardiovascular risk factors
O3	Reduction of emergency hospitalisations/admissions
O4	Reduction of the duration of hospitalization for the person with diabetes (any cause)
O5	Increase appropriateness in the use of technologies
O6	Increase active participation/adherence of the person with diabetesto the care plan
O7	Prevention and care of pregnant women affected by diabetes or gestational diabetes, in order to obtain maternal-fetal outcomes as in non-diabetic women
O8	Increase skills and strategies to prevent type 2 diabetes
O9	Increase skills and strategies to treat diabetes
O10	Reduction of the incidence of chronic complications
O11	Reduction of the incidence of acute complications
O12	Optimisation of specialist care for specific conditions, with dedicated outpatient departments (pregnancy, foot, pumps)
O13	Training optimization of the professional figures involved in the care of the person with diabetes
O14	Implementation of integrated management paths for the person with diabetes
O15	Organization and implementation of epidemiological surveys aimed at programming / measuring / improving the quality of assistance, also through the creation and enrichment of clinical databases
O16	Increase the exchange of information among operators of the diabetology care network
O17	Optimization of integration between outpatient and hospital diabetes care, through the implementation of diagnostic pathways
O18	Optimization of the response to the medical-legal certification needs of the person with diabetes
O19	Reduction of assistance inequalities for conditions of fragility and social and health vulnerability

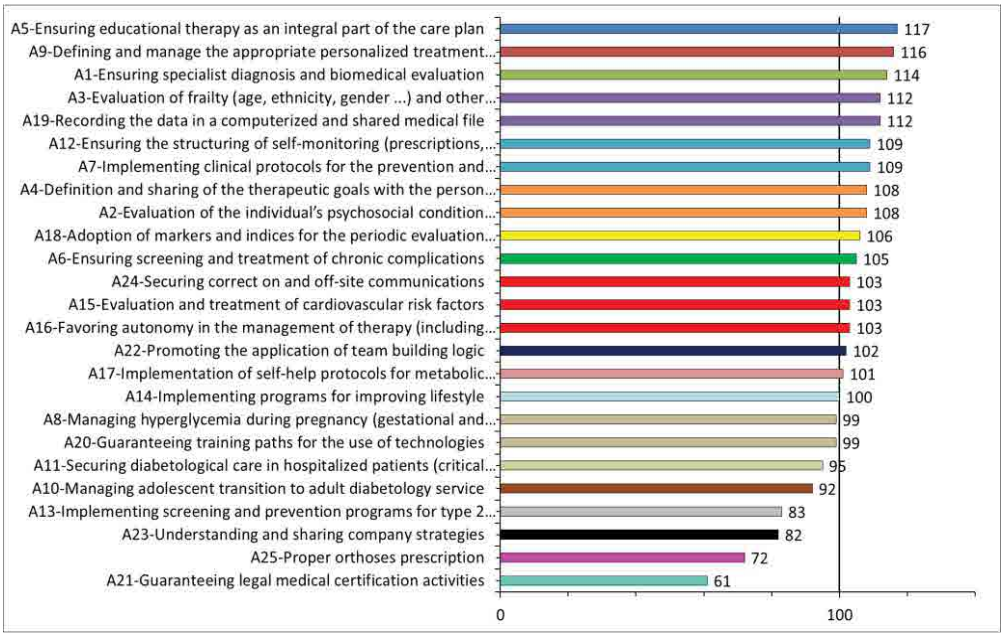

Figure 1. Activities of the diabetologic team, ranked according to priority (impact over the outcomes). Schematic representation of the impact of each activity (A1-A25) over the outcomes, resulting from the DIA&INT project. The calculated scores were normalized through indices: the activities that scored above the average are reported with values >100; the activities with a score below the average are represented with values <100. Each color represent an individual score.

Results

The results have been obtained based on the answers provided by 211 AMD diabetologists. One hour was needed to complete the questionnaire.

■ SROI results: priority of diabetic activities according to their ability to promote the implementation of the CCM

FIGURE 1 describes the ranking of activities obtained through the following steps:

- Extraction of the outcomes from the current healthcare models;
- Identification of the principal activities in diabetology (those with the highest impact over the outcomes);
- Definition of the priority skills (in support of the principal activities).

The calculated scores were normalized through index numbers: the activities that scored above the average are reported with values >100; the activities with a score below the average are represented with values <100. The main result is the presence, in the first 4 positions (**FIGURE 1**), of a mix of clinical and biomedical activities (educational therapy, personalized therapeutic plan, biomedical evaluation and assessment of fragility). These 4 activities support in equal measure the biomedical outcomes. Also, these activities have obtained excellent scores both in terms of intensity (degree of positive influence on the outcomes) and in terms of pervasivity (quantity of outcome positively influenced), showing a high sphere of influence in the implementation of a CCM.

■ Ranking diabetological activities according to specificity

*The results illustrated in **FIGURE 2** describe the ranking of specificity. The activities judged as more specific are: the definition and management of personalized treatment plans, and the diagnostic and specialist evaluation - or the biomedical assessment. The next items in the list are: helping the patient to self-manage the therapy, and guaranteeing educational intervention, which are both elements of patient empowerment, a stronghold of the CCM.*

From these results, it emerges that the specific competence of the diabetologist is strongly associated with the ability to make patients participate and take charge of their own condition.

■ Creation of the core competence curriculum of the diabetologist

Finally, the Core Competence Curriculum of the diabetologist was completed. This

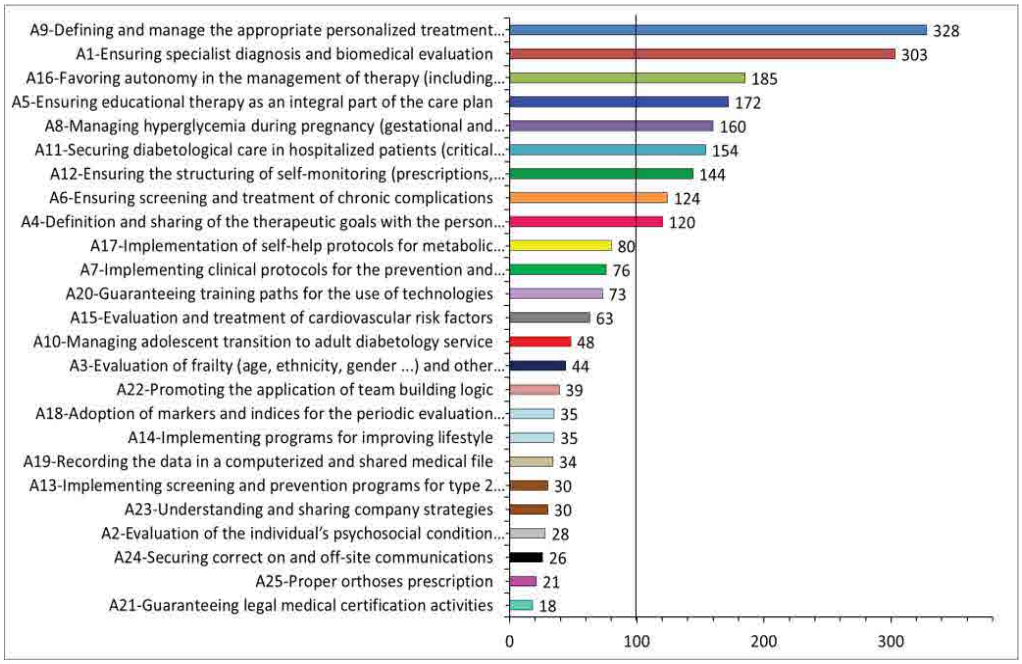

Figure 2. Activities of the diabetologic team, ranked according to specificity. Schematic representation of the specificity of each activity (A1-A25) for the diabetologist professionals, resulting from the DIA&INT project. The calculated scores were normalized through indices: the activities that scored above the average are reported with values >100; the activities with a score below the average are represented with values <100. Each color represent an individual score.

distinctive product of the DIA&INT project was then formally approved by the National Exectutive board of AMD. In this document, for each activity, the required knowledge and skills, based on the suggestions of the Italian Standards of Diabetes Care, were reported. The Core Competence Curriculum was generated according to the rationale of the CCM: activities and outcomes have been selected consistently with the CCM and the ability of each activity to favor a real implementation of the CCM was evaluated with the SROI method. This information is included in the Core Competence Curriculum, through priority ranking.

Discussion

Numerous theories support the importance of non-clinical factors on health outcomes in the models of management of chronic pathology, such as the CCM [11]. The urgent need to demonstrated how these factors may impact on diabetes management represents the rational that pressed AMD to develop DIA-INT project. The complexity of chronic diseases is not only synonymous with complications requiring more therapy or more technology, but also with the difficulty of individuals having to cope with the disease on daily basis, reshaping their life according to complex treatment schemes and to the dynamics of a condition that needs continuous assessments over time. In fact, all models of chronic care management clearly state that clinical efficacy in the treatment of chronicity is obtained by carefully responding to the needs of the disease, but also, and above all, by intervening incisively on the lifestyle, adherence to therapy, and autonomy of the person with diabetes, preserving the quality of life [6-8]. In the diabetes field, this is also clearly stated in the recent ADA-EASD consensus statement, that poses as major target for diabetes management to prevent disease' complications and to guarantee patients' quality of life (ADA_EASD guidelines). This process of care, objectively very complex and demanding, requires highly specialized skills and adequate training, that this project aimed to articulate with precision and clarity. The strengths of this work lie in its scientific rigor and innovation. In fact, the identification of the activities for the curriculum was carried out by experts (who had previously drawn up the reference guidelines, providing all the bibliographic references), and the validation of the document was carried out by the National Executive board of a scientific society. The innovativeness of this document also relies on the fact that, for each activity,

both specificity and priority - in terms of ability to support a real and concrete implementation of the CCM - have been assessed through the calculation of the SROI. For the implementation of this method, the priority was determined according to the precise results expected, and according to the ability of each activity to affect all the desired results in diabetology. Furthermore, for each activity of the Core Competence Curriculum, the relative degree of specificity was also reported. This information may be crucial to facilitate the implementation of integrated care pathways by supplying a clear indication of the complementarities between the different professionals involved in the care process. Furthermore, the survey sample size was specifically measured through an official algorithm [18], and it was deemed adequate to respond to the aims of this project [22]. Several clusters based on geography, gender, age, type of specialization and type of structure in which the diabetologist works were also analyzed. The evaluation of priorities based on the SROI method is an experimental procedure that needs to be further validated before these results could be generalized and transformed into a list of indicators, and this may be a limitation that should be considered when interpreting our results. Our results may also have potential implication for the health system organization. Thus, the creation of a specific core curriculum of competences for health professionals involved in diabetes care may be the appropriate way to bring out the value and specificity of a medical specialty dedicated to the care of chronicity, such as diabetology. In fact, if on one hand, the need for specific skills for empowerment and self-organization is widely recognized [9,11,12,23], on the other, these requirements still have no curricular counterparts in diabetology. In addition to this, there is no curricular evidence and recognition for management skills and assistance competence, that diabetologists are dutifully expected to master. This document may unleash its full potential as a concrete tool to support chronic management models, if it will be complemented by the curricula of the other health professionals involved in the management of diabetes. With this goal in mind, AMD has started a collaboration with the Italian OSDI (National Association of Health Operators in Diabetology) and SIMG (Italian Society of General Practitioners) in order to generate the core curriculum of the diabetes team, with clear indications of skills, tasks and responsibilities of each professional, a fundamental tool for the construction of modern and applicable integrated care pathways.

Conclusions

This project allowed the production of the Core Competence Curriculum of the diabetologist - position statement of AMD 2017 - constructed on the basis of a rigorous scientific methodology. The creation of the curriculum aimed to clearly identify, as objectively as possible, all the skills necessary to obtain good results in diabetes care. The creation of specific curricula, also for the other professionals part of the diabetological team, will be able to adequately complete this project in the perspective of a real implementation of an effective and efficient treatment model for a chronic pathology such as diabetes.

Competing and conflicting interests

The Authors declare that no competing interests exist.

References

1. Bruno G, Carta Q, Runzo C *et al.* Incidenza e prevalenza del diabete mellito tipo 2. II *Diabete.* 16(1):295–299 (2004).
2. Gnavi R, Karaghiosoff L, Costa G *et al.* Socio-economic differences in the prevalence of diabetes in Italy: the population-based Turin study. *Nutr. Metab. Cardiovasc. Dis.* 18(10), 678–682 (2008).
3. Fano V, Pezzotti P, Gnavi R *et al.* The role of socio-economic factors on prevalence and health outcomes of persons with diabetes in Rome, Italy. *Eur. J. Public. Health.* 23(6), 991–997 (2013).
4. http://arno.cineca.it/journal/osservatorio-arno-diabete-il-profilo-assistenzial/
5. Giorda CB, Picariello R, Nada E *et al.* Comparison of direct costs of type 2 diabetes care: different care models with different outcomes. *Nutr. Metab. Cardiovasc. Dis.* 24(7),717–724 (2014).
6. Assal JP. Revisiting the approach to treatment of long-term illness: from the acute to the chronic state. A need for educational and managerial skills for long-term follow-up. *Patient. Educ. Couns.* 37(2), 99–111(1999).
7. Assal J, Jacquemet S, Morel Y. The added value of therapy in diabetes: the education of patients for self-management of their disease. *Metab. Clin. Exp.* 46(12), 61–64 (1997).
8. Lacroix A, Jacquemet S, Assal J. Patients' experiences with their disease: learning from the differences and sharing the common problems. *Patient. Educ. Couns*. 26(1–3),301–312 (1995).
9. http://www.salute.gov.it/portale/documentazione/p6_2_2_1.jsp?lingua=italiano&id=2584
10. Stone M, Charpentier G, Doggen K *et al.* Quality of care of people with type 2 diabetes in eight European countries: findings from the Guideline Adherence to Enhance Care (GUIDANCE) study. *Diabetes. Care.* 36(9), 2628–2638 (2013).
11. Wagner EH. Chronic disease management: what will it take to improve care for chronic illness? *Eff. Clin. Pract*. 1(1), 2–4 (1998).
12. http://www.salute.gov.it/imgs/C_17_pubblicazioni_1885_allegato.pdf
13. Giorda C, Nicolucci A, Pellegrini F *et al.* Improving quality of care in people with Type 2 diabetes through the Associazione Medici Diabetologi-annals initiative: a long-term cost-effectiveness analysis. *Diabet. Med.* 31(5), 615–623 (2014).
14. Rossi M, Candido R, Ceriello A *et al.* Trends over 8 years in quality of diabetes care: results of the AMD Annals continuous quality improvement initiative. *Acta. Diabetol*. 52(3), 557–571 (2015).
15. AMD. Diabetes Intelligence [Internet]. AMD DIA&INT DIABETES INTELLIGENCE. [cited 2019 May 19]. Available from: http://diaint.assocons.it/
16. http://www.socialvalueuk.org/resource/a-guide-to-social-return-on-investment-2012/
17. http://www.tiki-toki.com/timeline/mbed/141733/0257412062/#vars - date=2017-09-20_11:12:20!
18. https://www.surveysystem.com/sscalc.htm
19. https://help.surveymonkey.com/articles/en_US/kb/How-many-respondents-do-I-need
20. http://www.standarditaliani.it/skin/www.standarditaliani.it/pdf/STANDARD_2016_June20.pdf
21. http://www.quotidianosanita.it/allegati/allegato7869756.pdf
22. Cahn A, Raz I, Kleinman Y *et al.* Clinical Assessment of Individualized Glycemic Goals in Patients With Type 2 Diabetes: Formulation of an Algorithm Based on a Survey Among Leading Worldwide Diabetologists. *Diabetes. Care.* 38(12), 2293–2300 (2015).
23. http://www.salute.gov.it/portale/lea/menuContenutoLea.jsp?lingua=italiano&area=Lea&menu=leaEssn